



AN

✦ ILLUSTRATED ✦ WEEKLY ✦ MAGAZINE ✦

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

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FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

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"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word TO BUILD is the Anglo-Saxon Bylsan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"Always be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE.

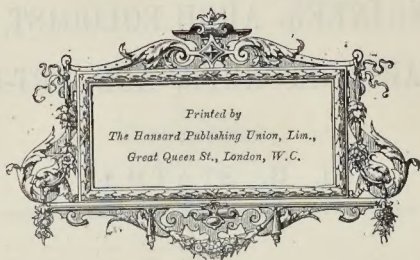
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## Paris in the time of Francis I.



N the first number of the *Builder* for the year 1888 we gave our readers a view of "London in the time of Henry VIII.," and we now, as a companion picture, present them with a view of the

capital of the other hero of the "Field of the Cloth of Gold." Our view represents the City of Paris, as it appeared during the closing years of the reign of Francis I., and, like that of London, it is a bird's-eye view taken from a point nearly due east of the city.

When we first visited Paris, forty years ago, many indications existed of the old city and of the buildings of its famous university, which have since disappeared. Among these we may mention the old Commandatory of St. John Lateran, portions of the monastery of the Jacobins or Dominicans, gateways and other fragments of the numerous colleges, chapels, churches, and monasteries which helped to make the Paris of the Middle Ages one of the most remarkable cities of the world. Mediæval Paris must have been a marvellously picturesque city, and fortunately so many plans, drawings, and engravings of it are in existence, that it is possible, with the assistance of what still remains, to obtain a fair idea not only of its general appearance, but also of the individual buildings which formed such grand features of the ancient city. This task is rendered less difficult than is usually the case by the fact that French antiquaries and archæological writers of later

times have produced such a number of carefully-written and profusely-illustrated books upon the subject, and that there are also numerous old manuscripts in public libraries, not alone in France, but elsewhere, which contain views of Paris dating as far back as the fourteenth and fifteenth centuries; amongst others a very beautiful breviary has a most exquisite representation of Our Lord's triumphal entry into Jerusalem, the background of which represents Paris at the end of the fifteenth century. Another very interesting manuscript picture is that which depicts the reception of Isabella of Bavaria, wife of Charles VI., into the French capital. The city is also represented in the backgrounds of numerous old pictures and tapestries. When we come to printed works the early views are very numerous. Amongst them are those of Braun, 1530; of Sebastian Munster, dated "MD." but supposed not to be really earlier than 1550; Olivier Truschet's view, 1550; Belleforest's view, about 1573; and the very fine drawing, called "Plan de Vassalien," 1609. There is also a grand plan worked upon tapestry which was formerly at the Hôtel de Ville, and is supposed to date from 1537.

For views of individual buildings, there are several remarkable collections by Du Cerceau, Van Meulen, Merian, Cohen, and an unnamed collection which would appear to date from the earlier part of the seventeenth century. There are also many charming etchings of great artistic merit by Israel Silvester, and very many others of less artistic merit, but still topographically interesting.

Amongst the writers of the last century and of the commencement of the present, we should mention the names of Le Beuf, who, in 1754, published his "Histoir de la Ville et de tout le Diocèse de Paris," in fifteen volumes, and somewhat earlier his "Dessertations sur

l'histoir ecclesiastique et civil de Paris;" Germain Brice, who about the same time wrote his "Description de la Ville de Paris," in four volumes; and Millin de Grandmaison, who in his "Antiquités National" (five vols. Paris, 1795-1799) gives numerous views and descriptions of monasteries and churches which have ceased to exist. At the commencement of this century numerous works upon the subject were also produced. We may expressly mention "Tableau Historique et Pittoresque de Paris," par M\*\*\*\* (Paris, 1808), and "Histoir Dulaure et St. Victor de Paris," 1818-1820. During our own time several magnificent works on the subject have proceeded from the French press. In 1835 Mr. Albert Lenoir commenced "Le Statistique Monumental de Paris," illustrated by most careful plans, elevations, sections, &c., contained in two large, folio volumes. But these have even been surpassed by a work called "Paris à travers les Ages," by Fournier et Cousin, with drawings by Hoffbauer (Paris, 1875-82). It is, perhaps, not too much to say that this is the most splendid work of its class that we have ever seen. It is illustrated in the most sumptuous manner by steel engravings, woodcuts, chromo-lithographs, reproductions of ancient plans and drawings, designs, restorations, historical subjects, &c. A very ingenious method has been adopted to show the modern condition of the localities represented: the tissue-paper *garde* before each ancient plan has the lines of the modern streets indicated upon it. There are, of course, many excellent, but less ambitious, books upon the archæology of Paris.

A most valuable little book upon the subject is the "Itinéraire Archéologique" of Guilhaemy. The charming sketches of Martial, etched by A. P., of bits of Old Paris, are also most valuable, and much



information may be gained from Noveaux and Asselineau's "Reproductions des Monuments d'existence plus: 1839," and Gordon de Grenoillac's "Paris à travers les Siècles," and many other works. One cannot help being struck by the fact that even at the very period when the ancient buildings were in course of destruction, the French artists and antiquaries were hard at work sketching, drawing, and measuring them, and, what is more remarkable still, the Government was advancing funds for their publication. How different has been the action of our own Government in this respect. Here our artists or antiquaries receive no assistance in such arduous tasks, and are entirely dependent upon the public.

A careful study of the existing remains of the ancient city, and notes of those which have disappeared since 1850, together with the materials mentioned above, have been combined to produce the view published in this number. Paris in the time of Francis I., and, in fact, during the whole of the Middle Ages, consisted of three distinct portions,—the large island in the middle of the Seine, called "La Cité"; the part on the north bank of the Seine, called "La Ville"; and that on the south bank, called "L'Université." The three may be typified by "The Church," "The State," and "The Arts," or "Piety," "Freedom," and "Learning." "The Cité" was the *locale* of the great Cathedral, the Bishop's Palace, the Hôtel Dieu, and the earliest churches and monasteries; in fact, the whole of the Eastern portion of the island was purely ecclesiastical, for, in addition to the Cathedral and Bishop's Palace, the vast Hôtel Dieu, with its three chapels, convent, and halls, occupied a space nearly 500 ft. long to the south, while to the north and east the immense enclosure called the Cloître de Notre Dame extended, enclosed by walls and entered by gates; it formed a regular ecclesiastical city, with its numerous streets of houses all occupied by the canons, clergy, and other members of the immense establishment attached to the cathedral of Notre Dame. Immediately to the east of the Cathedral was the very ancient Priory of St. Denis du Pas, with its diminutive church dating from the tenth century, with a crypt beneath it which was still more ancient, possibly of the sixth century. Like all the earliest churches in Paris, it was square-ended, and it is by no means improbable that the English, after all, got their square east-end from the French, as the Saxon churches were apsidal. Within the Cloître de Notre Dame were also the churches of St. Pierre aux Bouffes, St. Jean le Rond, and St. Aignan.

The old Bishop's Palace was erected by Maurice de Sully in the twelfth century, but was for the most part rebuilt in the eighteenth century; the chapel, however, remained until the outrageous destruction of the building by the mob in 1830. There are very numerous old engravings of the Bishop's Palace, Hôtel Dieu, and of the numerous churches which formerly existed on the island; there would appear to have been as many as eighteen of them in the time of the Revolution. They were for the most part irregularly-planned structures, though two or three of them were more important. The ancient church of St. Bartelmi, which formerly belonged to a priory, was a large early building; the church of the Barnabite Priory was also fairly large, and St. Gervaise des Ardents and St. Christopher were respectable parish churches. The priory church of St. Denis de la Chartre was a very early building, consisting of an aisleless nave and a square-ended chancel. The west end of the island was and still is occupied by the Palace of St. Louis, a magnificent structure, of which now little remains except the exquisite Ste. Chapelle, and four towers facing the Seine. The Salle des Pas Perdue occupies the site of the great hall of the Palace, which was burnt in 1618, and of which Du Cerceau has left some excellent drawings. It consisted of two wide

naves, each covered with a barrel vault of wood, with tie-beams and king-post, and was lit by two-light windows. The Cour du Mail, to the right of the chapel, was also a beautiful thirteenth-century building, but the Cour des Comptes, to its south, was elaborate late Flamboyant: it was, however, burnt down in 1737, but is represented by engravings in the works of Germain Brice, and others.

The "Cité" was connected by four bridges with "La Ville" and "L'Université." The latter was, next to the island, the most thickly-populated portion of Paris, and abounded in churches, monasteries, and colleges. Its parochial churches were singularly fine buildings, and two of them have escaped to our own days.—St. Severin and St. Etienne du Mont. St. Severin, with its double aisles, lofty clearstory, numerous chapels, flying buttresses, and beautiful thirteenth-century tower, is a most interesting example of a French parish church: it is a *mélange* of every style, from that of the thirteenth down to the eighteenth century.

St. Etienne du Mont did not appear as we now see it in Francis I.'s days. The choir and transepts were possibly completed, but, if so, they have evidently been very much altered since that period; the nave was not even commenced, and the tower was considerably less lofty.

There were, however, many other interesting parish churches, which have now entirely disappeared; that of St. Etienne des Grecs, or more properly Des Grés (Ecclesia St. Stephani ad Gradus), appears to have been the most ancient, though, judging from old prints, it does not look earlier than the fourteenth century. It consisted of a nave and aisles with an apsidal chancel and lofty tower, covered by a wedge-shaped roof. It seems to have possessed a very magnificent double doorway. The parish church of St. Benoit, which in early times belonged to the order of St. Benedict, is very carefully delineated in Lenoir's "Statistique Monumental." It was chiefly Flamboyant, not unlike St. Severin, only smaller and without a tower. The last vestiges of it were only pulled down about forty years back. St. André des Arts was a most beautiful Flamboyant church, consisting of a long nave and aisles lined with chapels, with its roof supported by bold flying-buttresses; it had a lofty tower near the west end, not unlike St. Jacques la Boucherie. There is an interesting engraving showing it in course of destruction.

The churches of St. Hilaire, St. Cosme (Cosmas and Damian), and St. Nicholas du Chardonnet, were small but interesting buildings. The monastic churches in this quarter of Paris were of great interest, and considerable remains of them are even now in existence. The first which we must notice is the great Abbey of St. Gervaise, the church of which adjoined St. Etienne du Mont; in fact, in earlier times, St. Etienne could only be entered through the Abbey Church. Lenoir, in his "Statistique Monumental," has left us such a complete series of plans, elevations, and sections of the old Abbey Church, that we know exactly what it was like. It consisted of a long nave and aisles of the transition period, covered externally by one vast roof, a short chancel terminating in an apse, a chevet with a very ancient crypt beneath it. This chancel was Norman in style, and considerably lower than the nave. There was a lofty tower, part of which still exists to the south-east, crowned by a spire. Internally, the whole was vaulted in a somewhat ponderous manner, the ritual choir projected far into the nave; it possessed neither transepts, clearstory, nor triforium.

Although we are not inclined to endorse Germain Brice's condemnation of the building, yet it must have been a more curious than beautiful church. The remarkably handsome thirteenth-century refectory and portions of the cloisters are still preserved in the Elysée, together with the more modern buildings of the monastery; it belonged to the Order of the Canons Regular. The beautiful little Priory Church of St. Julien le Pauvre still exists, though its nave is shorn of half its length;

the choir is a most valuable example of the First Pointed style.\*

None of the monastic buildings are now in existence, their site being covered by the huge buildings of the Hôtel Dieu.

The great church of the "Jacobins" (Dominicans), in the Rue St. Jacques, was a very remarkable structure. It consisted of two great naves, united by an arcade down the centre. A large chapel, attached to it at the north-east, made its eastern end present two large gables; it was square-ended, and covered internally with plain wooden roofs. The style was Early Geometrical, though a number of Flamboyant chapels had been added along the sides.

The great refectory was divided into two parts, and, to use Viollet-le-Duc's expression, was placed *au cheval* across the city wall, the part forming the reception-hall for a laity being outside the wall and the refectory of the monks within. Remains of the very handsome gateway leading to the church were in existence not many years ago, and numerous views of the buildings are to be found in the works previously mentioned.

The great Church and Monastery of the Augustinians stood upon the quay of the same name, and, judging from the drawings in Millin de Grandmaison's work, it must have been a single-span church of immense length, some 250 ft. long, and covered internally by a tie-beam and king-post roof; the style was Early Geometric. Both this and the Dominican church were full of magnificent monuments. The principal Church of the Carmelites, which was situated in the Place Maubert, on the site now occupied by a market, was also a single-span church with a timber roof, but had a very large chapel to the north-west, entered by a magnificent doorway at its eastern end. It was about 190 ft. long. The cloisters, which were of the same date as the church, were large and spacious, though rather plain. The whole building is most carefully illustrated by Lenoir.

Like the other buildings of the Mendicant Orders in Paris, the Carmelite Church had neither tower nor spire, but simply a *flèche*, and was very plain as to its architecture.

The Cordeliers had an immense church and monastery close to the wall on the west side of the University quarter. Unfortunately, it was burnt down during the reign of Francis I. It was erected in the year 1289, and appears to have partaken of the same character as those of the Augustinians and Carmelites; in fact, these vast conventual churches depended for their effect far more upon their size than upon their architectural detail. They were, in fact, great cheap churches, intended to hold immense congregations, and preaching formed a very important portion of the services held within them, and their very plainness and cheapness gave them a remarkable and striking character. Such buildings go to show that the architects of the thirteenth and fourteenth centuries were quite as skilful in dealing with churches where only limited funds were attainable, as they were in erecting sumptuous cathedrals. But they had learned this lesson, that a cheap building, in order to be good, must be extremely simple and plainly treated. And we find that the only ornamentation of any kind in which they indulged was window tracery, and sometimes a rather elaborate doorway, which was, however, nearly always a later addition. Undoubtedly, in later times, these churches became filled with costly furniture, monuments, stained-glass, &c.; but these formed no part of the original intention of their architects.

Of the buildings which were associated with the magnificent mediæval University of Paris little, alas, now remains; the great college of the Sorbonne has been entirely rebuilt in later times, and although here and there an ancient gateway or turret may be discovered down some courtyard or narrow street, not one of the forty colleges which were in existence in

\* Paris was not erected into an Archbishopric until the time of Louis XIV.

\* All who take an interest in Mediæval architecture will have with regard to the destruction of this most valuable example of thirteenth century work is contemplated.



the time of Francis I. remains at the present day. The charming little chapel of the college of St. Jean de Beauvais, and the vast refectory of the college of the Bernardines, give us some faint idea of the Mediæval glories of the grand old University at which Dante, S. Dominic, Gherson, Erasmus, Calvin, St. Ignatius Loyola, St. Francis Xavier, and St. Vincent de Paul were students; but it is impossible, without consulting ancient drawings and documents, to obtain any idea of its magnificence. In its palmy days it must have quite equalled Oxford or Cambridge in the beauty of its buildings. The most magnificent college was undoubtedly that of the Bernardines, and, fortunately, the illustrations of this building are both numerous and reliable. Lenoir gives drawings of portions of the chapel, which remained to his day; and the grand refectory and dormitory had not then been mutilated to convert them into a barrack. This college was founded by an Englishman, Stephen Lexington, Abbot of Cluny, but afterwards passed into the hands of the Cistercian order, and became the college at which members of that body attended who wished to obtain degrees from the oldest and most dignified university in Europe. The buildings were of immense dimensions. The chapel, which was commenced in 1338, at the expense of Pope Benedict XII., was to Paris what King's College Chapel is to Cambridge. It consisted of a vast and lofty nave and aisles, with twenty-nine side-chapels, and the whole was vaulted in stone, and supported by magnificent flying buttresses. It had a square east end, and no apse, but the writer in "Tableau Historique et Pittoresque" says that "the chevet\* is lighted by windows of prodigious length, full of the most magnificent stained glass." There was a small tower at the east end, adjoining the south aisle, and a lofty *flèche* arose from the roof of the nave. Unfortunately, this noble chapel was never completed, for although Benedict XII. left funds for that purpose in his will, the money was stolen on its way to Paris, and the three or four western bays were never, consequently, vaulted in. Even Germain Brice, who, in common with most writers of his date, abuses Gothic architecture, says "this was a veritable *chef d'œuvre*," and he greatly praises the lightness and beauty of its vaulting. The length of this chapel was about 280 ft., and its width close upon 100 ft. The chapter-house, which was at right angles to the chapel, at the east end, was a most beautiful apartment; its vaulting, composed of nine bays, was supported upon four slender columns. The refectory and dormitory were on the same vast scale as the chapel; the former was 260 ft. long, vaulted, and divided into nave and aisles by two rows of arches. The dormitory above it was the same size, but covered by a great open timber roof. This building still remains, though sadly mutilated; in its original condition it must have been surpassed by scarcely any other building of its class erected during the middle ages. There was an immense courtyard, enclosed by the church on its north side, the refectory and chapter-house on its east; unfortunately, the buildings to the south and west and the great cloister had been destroyed during the seventeenth or eighteenth century; if, however, they were as magnificent as the chapel and refectory, this court must have surpassed the Quad at Trinity or the Tom Quad at Christchurch, and the whole building must have been the most splendid collegiate edifice in Europe.

Three ancient colleges adjoined that of the Bernardines, those of St. Michael, "Des Bons Enfants," and "Cardinal Lemoine." The first-named had a pretty gateway, which was in existence a few years back; the second is chiefly celebrated from the fact of Vincent de Paul having been some years its rector; and the third possessed a very pretty chapel, which is illustrated in "Tableau Historique." The "College de Cluny," which was situated near the Sorbonne, was a building of

very great beauty. Its chapel was, as Guillermy in his "Itinéraire Archéologique" points out, almost a counterpart of the Ste. Chapelle. It had the same lofty pinnacled buttresses, sculptured cornices, and long windows. Internally it was vaulted. Attached to the chapel was a beautiful cloister, and the refectory and other buildings were equally admirable in design. There are many illustrations of this edifice, and the etchings of Martial represent its ruins after the Revolution, beautiful even in their decay.

Of the Colleges de Navarre and Montaigu, there are still some considerable remains. They would appear to have been plain but large fifteenth century buildings. Fragments may still be traced of several others, but the most valuable relic still preserved of the University buildings of Paris is the elegant Chapel of the College de Beauvais. It is a smaller and plainer edition of the Ste. Chapelle, with a wooden barrel roof internally. The *flèche* is excellently designed, and the window tracery is of the best period of Geometrical work. At the time of the recent expulsion of the religious orders from Paris, this building was in the possession of the Dominican order. It is sincerely to be hoped that this most valuable structure will be carefully preserved.

A most interesting building called "The Commandatory of St. John Lateran" was in existence when we first visited Paris. It consisted of a large chapel of twelfth or thirteenth century work, with a remarkably beautiful and rich Decorated chantry chapel attached to its north side. This chantry chapel was lit by four-light windows, containing very English-looking tracery. There was a great isolated tower near the chapel, and the remains of a large crypt or hall.

The Musée de Cluny, originally the Hôtel de Cluny, is a most charming example of fifteenth century Domestic architecture, and is, alas! the only remaining building of its class left in this part of Paris, though in the University quarter there were formerly many mansions of the same description,—the Hôtel St. Denis, the Grand Hôtel de Nesle, the Petit Hôtel de Nesle, the "Château Gaillard," the Hôtel de Nesmond, &c., all of which have now vanished.

"L'Université" was formerly surrounded by walls, defended by towers, and entered by gates erected by Philip Augustus, with a moat or fosse. Near Le Mont de St. Gervais the fosse assumed the appearance of a deep ravine.

The Tour de Nesle, at the extreme west, had a chain attached to it which extended across the river, the opposite end being affixed to the "Tour de Grand Prévoit," near the Louvre. A fortified structure, called La petit Chatelet, defended the "Petit pont," and attached to the Port St. Bernard, was another castellated structure, called "La Tournelle," which is associated with the history of St. Vincent de Paul, who prevailed upon the king to have the galley-slaves, who were formerly shut up in the dungeons of the Chatelet, removed to this building, and it was here that he used to visit them from the neighbouring College Des Bons Enfants, of which he was rector, and offer the consolations of religion to these unfortunate criminals.

A chain was suspended from La Tournelle to a tower on the Ile de Notre Dame, so called because it was covered with gardens which belonged to the Chapter of the Cathedral.\* East of the Ile de Notre Dame was another island, called the "Ile des Vaches." The stream which separated the two is now filled up. The two united are now known as the Ile St. Louis.

The portion of Paris called "La Ville" is on the south bank of the Seine, and was, in the time of which we are speaking, divided into two parts, that nearest the back of the river being enclosed by a wall erected by Philip Augustus, and the outer portion cover-

ing the space contained between the wall of Philip Augustus and that erected by Charles V. The eastern portion, however, which extended to the bank of the Seine, was called the Marais. The old Louvre of Charles V. stood between the two walls at the extreme west of La Ville. In the time of Francis I. the building was in a transition state, consisting partly of towers of the old feudal castle, and in part of the superb Renaissance palace which was designed to supersede it. Almost adjoining the Louvre to the east was the stately Hôtel de Bourbon, which, together with the whole of this portion of Paris, has been admirably illustrated in "Paris à travers les Ages."

Almost touching the Louvre were the two small churches of St. Thomas and St. Nicholas, and near at hand were the hospital called the "Quinze vingt" with its curious church, and the church of St. Honoré, which possessed a lofty tower and spire, and which, though no longer in existence, has given its name to the district. The stately church of St. Germain l'Auxerrois still exists, though not in the condition described by Germain Brice, who complains that "its interior was rendered almost dark by stained-glass and ancient wall paintings." Its ancient cloister has also ceased to exist, though when we first visited Paris a charming angle oriel was to be seen, which probably formed a portion of this building. The great Church of St. Eustache is shown in our view as a mass of scaffolding. It was only commenced in the year 1530. To the west of it will be noticed the ancient Church of the Innocents, with its vast cloister surrounding the cemetery of the same name. Lenoir gives a number of most interesting views of this church and cemetery, which was one of the most picturesque objects in ancient Paris, and although sanitary authorities may rejoice over its removal, yet the artist has lost a series of unrivalled subjects for his pencil; such a combination of Gothic arcades, chantry chapels, monumental crosses, ancient tombs, picturesque gables, fresco paintings, votive tablets, and sculpture was not to be found anywhere else in Europe. The church itself was a remarkably fine thirteenth century structure, surrounded by chapels, and its vaulting was supported by noble flying buttresses. Almost adjoining the cloisters stood the interesting church of St. Opportune; and slightly to the north-east two other beautiful churches, which have now entirely disappeared. One was called St. Sepulchre, and possessed a very fine western portal, of which many drawings are to be found; the other was the cruciform Priory Church of St. Magliore, which is described by Germain Brice as a lofty, vaulted building. The two churches of St. Leu and St. Mirri, or Mederic, have fortunately escaped the general destruction which seems to have reigned in this neighbourhood in the time of the Revolution and afterwards. The interesting church of St. Jacques l'Hôpital, close to the Port St. Denis, has, however, been less fortunate, which is much to be regretted, as it was a very characteristic building; numerous illustrations of it exist, and they show an edifice consisting of a nave with gable aisles, a very large east window, and a singularly magnificent double doorway at the east end of the south aisle. A large hospital seems to have been attached to this church. Outside the old Port St. Denis, and between it and the gate of the same name, built in the reign of Charles V., stood the stately church of St. Sauveur. It would appear from the old drawings to have been a very lofty building, with a tall tower, and consisted of a nave and aisles, with a clearstory, supported by flying buttresses, with a chevet arranged in a very peculiar manner, for while the choir was apsidal, the chapels round it were square, and presented five gables towards the street, the centre of which was pierced by a large doorway. This is almost the only Mediæval example we know of the principal entrance to a church being immediately at the back of the high altar.

Returning again to the banks of the Seine, we should have found at the time of Francis I.

\* The word "chevet" in French is frequently used to signify the east end of a church, whether square or apsidal.

\* The Cité, or great island, upon which the Cathedral stands, is sometimes called the Ile de Notre Dame, but this is an error. The Ile de Notre Dame was the second island, not the great one.



close to the Pont du Change, a very grim-looking fortress with embattled walls and turrets. This was the great Châtelet; its sinister reputation may be guessed by the fact that the street leading to it bore the ominous title of "Le Val de Misère;" it is excellently illustrated in "Paris à Travers les Ages." Two curious little churches stood in the immediate neighbourhood of the Châtelet; they were called St. Bon and St. Lefroi. The vast butchers' market and the "Grenier de Sel" also helped to crowd up this closely-built district. The great church of St. Jacques la Boucherie, the largest parochial building in Paris, with its two naves, four aisles, double chevet, and seventeen side-chapels, has disappeared, with the exception of its stately and magnificent tower, which remains as a protest against the barbarous destruction which has left it the sole relic of the great church.

The churches of St. Ives, St. Avoie, St. Croix, the noble parochial church of St. Jean le Greve, with its two towers, and the Hospital of the Holy Ghost, are among the victims of the destruction of the last century.

The beautiful Hôtel de Ville, which was burnt down by the Communists in 1870, was in course of erection during the latter part of the reign of Francis I. The noble church of St. Gervais, with elaborate flying buttresses and windows rich in tracery and filled with stained glass, has escaped, but the hospital, which stood near it, has disappeared. The church of Notre Dame de Blancmanteau,—so called because it was built by an Order of that name, though it afterwards passed into the hands of an order called the "Williamites,"—was rebuilt in the eighteenth century. The old church appears to have been a lofty structure. Judging from the 1609 plan, a very tall flèche and two large stone turrets flanking the choir were among its most striking features. Close to the wall of the city stood the chapel of Notre Dame and St. Claud de Braque, with the old Hôtel de Braque attached to it. Just outside the wall of Philip Augustus stood the immense Hôtel de Clisson, built by the celebrated Constable of that name, which in later times became known as the Hôtel "des Grâces" and Hôtel "de Guise." A gateway, flanked by large circular towers, still exists, incorporated in the Hôtel Soubise. Another historical mansion, the Hôtel Barbette, was for some time the residence of Isabella of Bavaria, the unhappy queen of Charles VI. The murder of the Duke of Orleans upon leaving this mansion caused this wretched queen to be suspected of the murder. Another magnificent mansion, the Hôtel de la Tremouille, erected from the designs of the celebrated Frère Jacquet, stood in the Rue des Bourdonnais. It was pulled down about fifty years ago.\* Close to the Port St. Martin, in the wall of Charles VI., are still to be seen the church and refectory of the Priory of St. Martin des Champs, converted into the institute Des Arts et Métiers. The church is an interesting structure, consisting of a single-span nave covered by a wood barrel roof, dating from the latter part of the thirteenth century. The choir is much earlier, and has a remarkable chevet with a trilobe eastern chapel. The great feature, however, of this monastery is the refectory, the vaulting of which springs from a row of slender, graceful columns down the centre of the building. This beautiful refectory is said to be the work of Pierre de Montreuil, the eminent architect of the Ste. Chapelle, who also designed the elegant Lady Chapel, now destroyed, but a plan of which is given by Viollet-le-Duc. Another large, isolated chapel, dedicated to St. Michael, stood between the abbey-church and parish church of St. Nicolas, which latter still exists, and is one of the handsomest parish churches in the city. A portion of the cloister of the "Carmes Billetes" still remains, but the church was rebuilt in the seventeenth century. Close to

the wall near the gate of St. Paul stood a convent and hospital called the "Ave Maria," founded by that strange mixture of cunning and piety, Louis XI. There were several old mansions in this neighbourhood, amongst others the Hôtel Barbeau and the beautiful Hôtel de Sens, the gateway of which is one of the finest examples of Domestic architecture of the fifteenth century existing in Paris. At the point where the wall of Philip Augustus ran down to that branch of the Seine which flowed between the "Ile des Vaches" and "La Ville," stood the "Tour de Barbeau," to which was attached one end of the chain which closed up this channel of the river. Not far from this point, the great Rue St. Antoine entered the district called the Marais, through a gate called the Port de Baudoyer, near the church called "Le petit St. Antoine," to distinguish it from the abbey-church of the same name, which stood without the Porte St. Antoine. The great parochial church of St. Paul stood between the Seine and the Rue St. Antoine; it was a stately structure with a lofty tower, and, like most of the greater parochial churches in Paris, consisted of a lofty nave and aisles, with a chevet, both surrounded by chapels. Several drawings of it are in existence. This church gave its name not only to the district, but to a vast palace erected by Charles V. Michelet informs us that when the dual kings, Charles VI. and Henry V., resided in Paris, Henry took up his residence at the Louvre and Charles at the Hôtel St. Paul. It was from this palace that the remains of the much-lamented Isabella of Bavaria were taken without a single mourner to St. Denis. Whether this unfortunate queen deserved the contempt with which she was treated is a question we leave to historians to decide, but there can be no doubt that the strong prejudice against her led to the abandonment of this magnificent palace. At the time of which we are writing the Hôtel St. Paul had entirely ceased to exist, and its site was covered by a number of noble mansions, among which may be mentioned the Hôtel de Brienne and Hôtel de la Reine. There were many other great houses in this neighbourhood, of which some fragments may still be traced—the Hôtel St. Pol in the Rue de Sicile, and the Hôtel of the Prévôt de Paris, opposite the Church St. Paul, the Hôtel d'Angoulême, and the Hôtel de Petit Musc. It would be, however, impossible to enumerate them because of the unfortunate practice, which seems always to have prevailed in Paris, of changing the names of buildings either with that of the dynasty or of the possessor. As an example of this, the Hôtel Petit Musc has at various times been called the "Hôtel Neuf," the "Hôtel des Estampes," "Hôtel Bretagne," "Hôtel d'Orange," "Hôtel de Valenciennes," "Hôtel de Roux," "Hôtel de Langres," "Hôtel de Main," and "Hôtel d'Ormerou." A stream, called the Egout St. Catherine, crossed the Rue St. Antoine, and upon its western bank stood the Priory of St. Catherine du Val des Ecoliers. An interesting drawing of it by Cochin, in the seventeenth century, shows a large cruciform church, with a long, aisleless choir, and a lofty flèche at the intersection; there are no flying-buttresses to the nave, which probably had a wooden roof. Another old engraving represents a remarkably elegant Gothic cloister, and the transept end of the church pierced by a large rose window, all which seems to suggest that the building was a beautiful structure. Another highly interesting church and monastery, that of the Célestines, stood by the quay close to the entrance of the Arsenal. As originally constructed, the church of the Célestines was one of those vast single-span buildings, consisting only of a great nave covered by a timber roof. But at the commencement of the fifteenth century the Duke of Orleans, whom we have already had occasion to mention, the brother of Charles VI., erected a most sumptuous chapel, attached to this church, as a self-inflicted penance for a practical joke which caused six or seven persons to be burnt to death. This chapel and others which were subsequently

erected became in course of time filled with monuments of such magnificence that they were excelled by those of no other church in France save only the Abbey of St. Denis. The great cloisters were erected about the year 1530, and are remarkable for being the first ecclesiastical structure in Paris erected in a purely Classical style.

On the north side of the Rue St. Antoine stood the Palace of the Tournelles, so called from the number of towers and turrets which formed its most distinguishing features. After the abandonment of the Hôtel St. Paul, this building became the principal residence in Paris of the French kings, and remained so until Henry II. was killed in a tournament held in its tilt-yard, after which period it was abandoned and allowed to fall into ruin. The representations of this great palace are so scarce and vague that it is somewhat difficult to say exactly what it was like. Probably the great building shown to the extreme right in the old manuscript illustration of Paris, to which we have previously alluded, may be intended to represent it.

The great Tilt-yard and the Bas-cour are shown in some of the old views of Paris, but the main building had ceased to exist at the period we are illustrating. There were a large park and gardens attached to the palace of the Tournelles, which extended almost to the Temple,—a vast edifice, partly monastic and partly fortress, which stood near the wall of Charles V. Its buildings consisted of a very remarkable church, the earliest part of which was erected by the Knights Templars, and was almost identical with the rotunda of the Temple Church in London. Great additions, however, were made to the building after the suppression of the order. A very deep open porch, with a large chapel over it, had been added at the west, and at the east a nave, transept, long choir, and tower, had been constructed; the very beautiful cloister at the west end is shown by Israel Silvester. There was a refectory and two great towers or keeps; one of these was a huge structure, defended by six extinguisher turrets. The great tower derived a sinister reputation from its being made the prison of the unfortunate Marie Antoinette and her family. Here, probably, were perpetrated those cruelties which ended in the death of the child-king Louis XVII.

Nothing now remains of the Temple of the Priory of St. Catherine, the Church of St. Paul, or the Monastery of the Célestines. At the end of the Rue St. Antoine stood the Bastille, the singular old fortress with eight towers, which was destroyed by the mob at the commencement of the Revolution.

There is a very characteristic letter by Horace Walpole which might advantageously be translated into French, in order to teach our neighbours a little more common sense. It might help to show them the absurdity of the mischief so frequently perpetrated in their political strife. Writing to Mrs. H. Moore, under the date "September, 1789," he says:—"I congratulate you on the demolition of the Bastille,—I mean as you do, of its functions. For the poor soul itself, I had no ill-will to it; on the contrary, it was a curious sample of an ancient Castellar dungeon, which the good folks, the founders, took for palaces. Yet I always hated to drive by it, knowing the miseries it contained. Of itself it did not gobble up prisoners to glut its maw, but received them by command. The destruction of it was silly, and agreeable to the ideas of a mob who do not know stones or bars and bolts from a *Lettre de Cachet*. If the country remains free the Bastille would be as tame as a ducking-stool, now that there is no such a thing as a scold. If despotism recovers the Bastille will rise from its ashes."

We have now described, as far as our space will allow, the most interesting buildings within the ancient walls of Paris, but as our view shows some of the edifices which were without the walls, we must say a few words about some of them. In the suburbs of "La Ville," to the north, were the old Abbey of Montmartre, the twelfth-century church of

\* It is but right to say that the drawings extant of the Hôtel de la Tremouille represent a building that does not look in the least like the work of an Italian architect; but, on the other hand, the Hôtel de Ville, which was certainly the work of Dominic of Cortona, has few Italian characteristics.



which is still in existence, though, unfortunately, the choir is desecrated. Outside the Port St. Martin stood the Monastery of St. Lazare, which formerly belonged to an order of military knights; but in latter times became associated with the history of St. Vincent de Paul. It was here that he established an order, or congregation of priests, which still bears his name; the church no longer exists, and the more modern buildings of the monastery are used as a prison; the memory, however, of this great and good man is commemorated by the stately basilica decorated by the wall paintings of Hippolyte Flandrin.

The church of St. Laurent, formerly attached to a priory, still exists, but the large hospital no longer remains. The Abbey of St. Antoine is not shown in our view.

The suburbs surrounding "L'Université" were extremely interesting; to its west stood the great Abbey of St. Germain des Prés, where many of the early kings were buried. The church, a noble twelfth-century work, still remains, though two out of the three spires which once adorned it have disappeared, as have also the Lady-chapel, erected by Pierre de Montreau (in which he was buried), the refectory, which was also designed by him, and all the other buildings of the monastery, amongst them the great prison which witnessed the massacres perpetrated at the Revolution. The magnificent Renaissance Church of St. Sulpice had not been erected in the reign of Francis I., but an interesting old church, of which several views still exist, stood on its site. Close to the present site of the gardens of the Luxembourg, within a vast enclosure, stood the monastery of the Chartreuse, with a large plain church ceiled with wood, and the separate houses for some thirty monks round its great cloisters. The celebrated Lesueur was a monk here, and his pictures, which now adorn the walls of the Louvre, were painted by him to decorate the little cloisters of the monastery. Nearer to the walls of the city stood the great hospital of St. Jacques "de Haut-Pas," which belonged to an order of Knights Hospitaliers, but afterwards passed into the hands of the religious Order of St. Magliore.\* Ancient views show it to have been very interesting, consisting of a vast hall, with a chapel at its eastern end.

In the immediate foreground of our view is shown the Abbey of St. Victor. Few monasteries in Europe have left a more brilliant record than this great religious institution. As Guilhermy points out, its monks were saints, theologians, savants, authors, poets, and artists. Within its walls was first established that great school of learning which ultimately developed into the University of Paris.

The buildings of the celebrated Abbey were not unworthy of its high reputation; they stood within a vast space enclosed by walls and defended by towers, which was bisected by a branch of the River Bièvre. Interesting views are given in "Tableau Historique et Pittoresque," "Les Anciens Edifices de Paris," &c. The church was a noble and very lofty edifice of various dates, and consisted of a spacious choir with aisles and chevet, magnificent transepts, and a nave and aisles of only three bays; all these were of rich Flamboyant work (1517-1534); but the great tower and spire which stood to the north of the chevet, the Chapel of St. Denis at the east end, and the entrance-hall or narthex, were twelfth-century work. The crypt under the choir was of very early date. The great cloisters were "transitional" in character, and were probably erected at the close of the twelfth century. The Little Cloisters and Infirmary Chapel are described by Le Beuf as being beautiful examples of the architecture of the close of the thirteenth century. The Chapter House was partly twelfth century and partly Flamboyant. The Refectory, Dormitory, and Infirmary dated from 1531-1535, and the apse of the Chapel of St. Denis from the fifteenth century. The buildings are said to have been so rich in stained glass that the

whole history of that art from the twelfth to the seventeenth century could be studied in this one monastery.

The arrangement of the church was in several respects remarkable. Firstly, with regard to its orientation, Le Beuf says that "its chevet pointed to the summer orient, whereas all of the ancient churches in Paris were turned to the winter orient." Le Beuf does not give any reason for this, but we are inclined to think it was a practical one. The ground evidently sloped away rapidly in a north-easterly direction down to the banks of the previously mentioned branch of the Bièvre. In some of the old plans of Paris the church is represented as being built north and south, but its aspein reality pointed almost exactly N.E.\* The second great peculiarity was the lowness of the aisle and the remarkable height of the triforium, which was vaulted and formed an upper aisle or gallery. This treatment is occasionally met with in twelfth century churches, but is so uncommon in Flamboyant ones, that we cannot help suspecting that the sixteenth century builders preserved the shell of the twelfth century church, and simply cased it up in Flamboyant work. The windows appear to have been all of four lights, and the transepts had magnificent rose windows, the leading lines of the tracery being arranged in the form of a Maltese cross. There was a remarkable lofty *fleche* over the crossing, and the piers of the choir were adorned internally with a rich series of niches. The whole church was vaulted, and the very lofty clearstory was supported by magnificent flying buttresses. In all probability the sixteenth-century builders intended to continue the nave several bays farther westward; but, if so, this was never carried out, and in the eighteenth century the old narthex was pulled down, and a quasi-Classical façade patched on to the end of the unfinished nave. Nothing now remains of the magnificent Abbey and Church of St. Victor, though the church appears to have existed down to the year 1797, and views taken about the year 1835 show some ruins of the monastic buildings, which look like the arcades of the Infirmary. The huge wine-market now covers the site of this venerable and celebrated edifice.

Paris of the Middle Ages must, indeed, have been a most interesting city, abounding in architectural grandeur and picturesqueness. Little, alas, of it is now left, except the noble cathedral, a few parish churches, and here and there a fragment of some collegiate or domestic building. Its site is covered by the most magnificent modern city of the world; but let us hope that Frenchmen, while continuing to adorn their splendid capital, will scrupulously preserve the few existing monuments of its past history. Unfortunately, the proposed demolition of St. Julien le Pauvre is a bad omen for a year which is to be marked by the opening of an Exhibition devoted to the arts.

#### TO LOVERS OF GREEK ARCHITECTURE: AN APPEAL.

**P**ROBABLY all architects, who are architects in spirit and in truth, will agree with the dictum of Quatremère de Quincy, that there is no class of architectural detail in which the distinction between a refined and a clumsy or corrupt style of architecture is so distinctly marked as in the designing of the profiles of its mouldings, and certainly no one who has accurate knowledge of the subject will question that, judged by that test if not by others, Greek architecture is *facile princeps* among the architectural styles of the world. Its mouldings are not only characterised by a refinement of line and contour, regarding them merely as design, which is not exhibited in those of any other known style, but they are practical illustrations of the intellectual spirit in which the Greeks of the

greatest period carried out every detail of architectural design, in the evidence they give of the application of mathematical and geometrical science in the adjustment of their curves and proportions.

Every architect, also, in the present day, will agree that the character of architectural mouldings of the best style cannot be adequately conveyed and recorded except by full-size sections; and that this consideration must apply with exceptional force in the case of mouldings of so refined a character as those of Greek architecture. It is only in rather recent times, however, that the importance of full-size sections has been recognised. In various works in illustration of Gothic architecture published of late years the mouldings have been carefully given full size. The late Mr. Edmund Sharpe was one of the first, if not the first, to call attention to the importance of this in the study and record of mouldings; his own collection of full-size mouldings of the various periods of Gothic architecture was a most remarkable one, of which only a portion was ever published. In one of his works in illustration of Gothic architecture, Mr. Sharpe adopted the method of placing a small section of the whole moulding to scale, in the corner of a plate, lettering the different points to which the full-size sections were to refer, and then drawing the full sizes in separate sections all over the page, each with index letters showing where the junctions were to be made, and thus getting the whole of a large group of Gothic mouldings on one moderately sized page, in a manner perfectly intelligible to an architectural student, though it would no doubt be bewildering to the lay reader; but as the lay reader mostly knows and cares nothing about mouldings at all, that is of little consequence.

But though Gothic mouldings have been thus profiled full size in modern publications, nothing of the kind has been done, in England at all events, for the far more refined and delicate mouldings of the Greeks. Even Mr. Penrose's celebrated work contains no full-size profiles, except one or two separate small mouldings; and it is the same with Mr. Pennethorne's work, and others which are standard illustrative works on Greek architecture. A few months ago the attention of the Hellenic Society was drawn to this subject in a short address by the Editor of this Journal, delivered at one of the afternoon meetings of the Society. Mr. Statham did not profess to bring forward any new facts about Greek mouldings (for which, indeed, Mr. Penrose and Mr. Pennethorne have left little room); but inasmuch as the Hellenic Society has concerned itself mainly with sculpture and vase-paintings, and very little with architecture, the nature and degree of interest attaching to Greek architectural mouldings was obviously a matter of new information to some of the members. At the conclusion of the lecture, reference was specially made to the want of adequate illustration of Greek mouldings by full-size profiles, in any published works, and it was urged that the Hellenic Society might well take this up as a matter coming entirely within the scope of the Society, the object of which is to illustrate and throw light upon the life, literature, and art of ancient Greece.

The seed did not fall, in this case, on stony ground; the Council of the Hellenic Society showed every wish to pursue the suggestion to a practical conclusion, but the Society, the objects of which naturally only appeal to the cultivated few, is at present by no means rich in funds, especially after the undertaking of raising the funds to establish the British School at Athens. Some unexpected assistance in the matter, however, came from a young architect, Mr. R. Weir Schultz, who obtained the Royal Academy gold medal and architectural traveling studentship in 1887, and decided to go to Athens to study the Greek monuments *in situ*. He undertook, in a liberal and truly artistic spirit, to do what he could while at Athens to procure such accurate full-size sections of Greek mouldings as might furnish material towards the production of a work

\* In the eighteenth century it had again changed hands, and was in the possession of the Oratorians.

\* The only old church in Paris which appears to have been built north and south was the Chapelle d'Orgemont, in the Cemetery of the Innocents.



illustrating this important feature of Greek architecture in an adequate manner.

Some part of this work Mr. Schultz accomplished during his first stay at Athens; and we now come to the special "appeal" which it is our object to make to lovers of Greek architecture. Mr. Schultz is about to visit Athens again in pursuit of his studies, and is ready to do what more he can towards increasing the collection of full-size mouldings already commenced; but he cannot afford under present circumstances and with present aids to remain long enough and give time enough to complete the work. The Hellenic Society have no funds at their disposal; and the Institute of Architects, which we should have thought had funds which it might most properly have applied in aid of such an object, has, we are informed, for reasons which we do not pretend to understand, declined to make any subscription towards the work. But it is hoped that some of those who understand the interest of the subject may be willing to subscribe so far as to make it worth while for Mr. Schultz to remain long enough at Athens to do the work thoroughly, and to get, at all events, the materials for something like a complete illustration of Greek mouldings. The question of publication, as we understand, has still to be considered; but the opportunity now occurs, at all events, preparing the materials for such a work; and we are told that Mr. F. C. Penrose, Cathedral Surveyor's Office, Chapter-house, St. Paul's-churchyard,\*

#### ILLUSTRATIONS OF OXFORD.

THE volume of sketches of Oxford by Mr. Fulleylove, long promised, has at last appeared.† The drawings from which the illustrations are reproduced were exhibited some time since at the gallery of the Fine Art Society, and we commented on them briefly at the time. Some subjects were in watercolour, some in pencil; some were exhibited in two editions, both colour and pencil, the latter having been done, we presume, for the purpose of reproduction for this work; for the plates given appear to be, from internal evidence, all produced from pencil drawings, a medium which is very well calculated for reproduction by lithography, much more of the original artist's touch being preserved in the copy than can be the case when reproduction in monochrome from colour is attempted. The artistic portion of the volume consists of thirty plates, giving views of various picturesque corners of Oxford, interesting both historically and architecturally, besides some small illustrations in the text of the introductory chapter, which, by the way, are from washed drawings, either monochrome or colour, and are so successful as rather to give us pause in regard to our verdict just now in favour of pencil.

It is impossible even to look at this set of small-scale sketches without feeling something of the fascination which Oxford, in her material as well as in her spiritual being, has exercised upon so many minds. In regard to the material aspect of the city of colleges, probably the fascination is stronger in modern times than it ever was before. Such a city stands to

us as a representative, rare indeed in these days in England, of a beauty and picturesqueness of building in cities which, under the press of modern life, seems for the time at least to have disappeared:—

"Retired Leisure  
That in trim gardens takes his pleasure,"

has neither time nor space for leisure nor for gardens now; and one goes into a college garden or green "quad" with a strange feeling of being in a world quite apart and distant from that which one is generally doomed to inhabit. To those who have not the right to claim filial relations with Alma Mater, it is the picturesqueness of the buildings and the quiet of the town that strike the imagination most; though Wordsworth taught some of us something of the more innate spiritual and intellectual interest which Oxford has for her own sons, when, with a poet's intuition (for he was not an Oxford man) he expressed his enthusiasm at the sight of the city in that glorious sonnet which will last as long as the English language lasts,—an outpouring of the heart into noblest language, which even perpetual quotation seems unable to hackney.

But we are wandering away from architecture, which it is difficult not to do when speaking of Oxford, where the architecture symbolises so much more than meets the eye. And it is curious to reflect that, with all the prestige which Oxford has as a town of architectural beauty, she has really no great building of the highest class architecturally. She has no King's Chapel, to stand as an unequalled example of its kind. The great architectural glory of Oxford consists in the multitudinous combination of buildings, none of them of the highest beauty or of very great purity of style in themselves, in such a manner that they can be seen grouped together in a *coup d'œil*, while the fine things of Cambridge are rather to be seen separately. Of quieter beauties in semi-domestic architecture combined with garden scenery (if one may use the term) Oxford can, however, show as fine a record as Cambridge. It is the architectural grouping which forms the charm of many of Mr. Fulleylove's drawings. No one could have been better fitted to do justice to such a class of subjects, for he combines the eye of an artist for effect and composition with more knowledge and experience in drawing architecture than the majority of contemporary artists possess. The two first views in the book are good illustrations of this artistic grouping and contrast. Nothing could be more effectively contrasted than the pyramidal group of St. Mary's Tower in the middle distance (Plate I.) with the heavy massive architecture of the Radcliffe Library, part of which is brought into the foreground. The Radcliffe in itself is a heavy and by no means a very beautiful example of Classic architecture; but it takes its place in the picture admirably. So in Plate II., in which Laud's roccoco porch to St. Mary's forms the foreground object, with the Gothic church crossing it in the background, and the rich cluster of the pinnacles of the spire rising behind. Plate III., "University College," gives one of the best of the High-street views and one of the most often illustrated, again with the happy contrast between the horizontal lines of the college front in the foreground and the spire of St. Mary's in the middle distance. Merton College Gate and chapel, with the street winding away into the distance (Plate V.), is a fine example of the picturesque of street architecture. Next we have the interior of Merton Library, with its curious triumphal arch rising between the bookcases, with the unmeaning but picturesque architectural erection on the cornice. A very pretty street view is that of Broad-street (Plate VII.), again showing the beauty of a winding street, into which the square Classic lines of the Clarendon building stand out as a kind of architectural promontory. The quad of Oriel College (Plate IX.), with the broad tower rising behind it, and the classic fronton intruded above the lines of Gothic windows, is a very picturesque

bit, but the perspective seems a little faulty: the point of sight, according to the buildings on the extreme left and on the right, is near the left-hand side of the picture, but the cornice line of the opposite buildings falls slightly towards the right, which certainly could not be unless the building was considerably out of level: perhaps only those who are in the habit of making perspective drawings of architecture would notice it; but it is an oversight. Plate X. shows another view of the High-street, as picturesque as those which preceded it, illustrating aptly what we remarked above as to the predominating element in the architectural beauty of Oxford; here Hawksmoor's heavy rusticated entrance to Queen's (reminding one at once of the architect of St. Mary Woolnoth) forms the foreground object, again contrasting with St. Mary's spire, which tells wherever it comes in. The beautiful New College cloisters ("curiously little known," says Mr. Ward, but we had thought otherwise) are done justice to in Plate XI.; the effect of the heavy, rich, perpendicular tracery, more solid in proportion than tracery of that date usually is, is very well given. The garden views come out better in the water-colours which were exhibited in Bond-street; the view of Wadham Fellows' garden hardly sufficiently illustrates the remark quoted from an American writer (Wendell Holmes?), that it was "the most distinguished small garden in Europe."

A reproduction from one of Mr. Fulleylove's drawings is given in this number, that of "The Clarendon building" in the foreground. The same building comes into several other views. This was the original house of the now famous Clarendon Press, which has moved in these latter days to more convenient quarters. This forms Plate XXVII. in the book, but does not tell so effectively on the smaller scale necessarily adopted there as in the larger reproduction which we are able to give. It was desirable, of course, not to make the book too large and unwieldy, but the considerable reduction from the original size of the drawings has resulted in a good deal of the artist's touch being lost in the reproductions, as those who compare our larger lithograph with the one in the book will probably admit. This appears to us one of the most admirably composed drawings in the book; and though the architecture of the Clarendon is of little interest in itself, the large masses of the columns and pedestal in the foreground have a fine effect in contrast with the quiet street scene which fills up the distance.

Mr. Humphry Ward's literary notes are pleasantly written, and convey as much information about the buildings as is needed by the general reader who wishes to know a little about the purposes and history of the buildings represented; but the main value of the publication is as a collection of very artistically treated scenes of picturesque architectural composition, which will interest architects and artists alike, and may also come to have an archaeological value as a record of buildings and street scenes, some of which, though we hope not many, will in process of time suffer change.\*

**The Institution of Civil Engineers.**—The following table shows the progress of this society, incorporated by Royal Charter, during the last decade and the past twelve months—the date given, January 2, being that of the establishment of the Institution in the year 1818:—

|                        | January 2, 1879 | 1888  | 1889  |
|------------------------|-----------------|-------|-------|
| Members .....          | 1,081           | 1,696 | 1,638 |
| Associates .....       | 1,717           | 2,856 | 3,003 |
| Honorary Members ..... | 20              | 20    | 18    |
| Students .....         | 535             | 917   | 967   |
| Totals .....           | 3,349           | 5,418 | 5,616 |

At the ordinary meeting on Tuesday, the 8th inst., the paper to be read with a view to discussion will be on "The Compound Principle applied to Locomotives," by Mr. Edgar Worthington, B.Sc., Assoc. M. Inst. C.E.

\* We have mentioned to Mr. Penrose that a statement of the subscriptions and subscribers' names should hereafter be published in this Journal.

† Oxford: illustrated by John Fulleylove, R.I., with notes by T. Humphry Ward, M.A. London: the Fine Art Society, 1888.

\* One or two of the street scenes are already altered by the demolition of old houses, in preparation for new buildings, since the drawings were made.



## NOTES.

**S**IR FREDERICK PEEL and his colleagues on the Railway Commission took farewell of the members of the Bar practising before that Court on Monday last, as the Commission ceased its existence with the expiring year. Sir Frederick and Mr. Price had served since the establishment of the Commission in 1873; while Mr. Miller, the retiring Commissioner, was selected to fill the vacancy caused by the death of Mr. Macnamara in 1877. The constitution of the new Commission under the Act of 1888 rendered the retirement of one member of the existing body unavoidable, and Sir Frederick Peel and Mr. Price, as members of the original tribunal, are naturally selected for the new appointment. Both Mr. Miller's late colleagues, and Mr. Littler, Q.C. (as senior member of the Bar) complimented and sympathised with the retiring Commissioner, and we presume that we may regard the knighthood conferred upon that gentleman on New Year's Day as a mark of recognition of his valuable services upon this Commission. With regard to its success there can be no two opinions. Before it had been in existence five years there had been a greater number of cases submitted for its consideration under Mr. Cardwell's Act than had been before the other courts in the whole of the twenty years that had elapsed since the passing of that measure. The Commission inspired a degree of confidence which was due very largely to its composition; for Mr. Macnamara was most intimately acquainted with all the details of the work of railways and also of common carriers. Mr. Price had been a railway director and chairman, while Sir Frederick Peel, by his quick perception of the legal points involved, and his weighty though clear utterances when delivering judgment, soon proved himself a capable President of the Court. The Commissioners have made an impartial use of the powers with which they were invested, and have pointed out from time to time where the law, which they were, of course, compelled to administer as they found it,—might advantageously be amended. There is no doubt that the newly-constituted Commission will be equally strong and worthy of confidence, and we hope that the favourable anticipations which have been formed regarding it will be realised.

**A** CORRESPONDENT, Mr. R. Langton Cole, writes to us:—"Seeing the strong probability that electricity will be supplied to most of London and our chief provincial towns before any great length of time, should not some knowledge of the principles of its use and application be required of students of architecture? With this object, the Royal Institute might include the subject in its curriculum, and the Architectural Association might provide instruction by a course of lectures or a class. I think it will be agreed that this matter should not be left entirely to the electrician, however able he may be, for the use of this new means of obtaining light and power affects the arrangement of a building most intimately, and in such a way that only the designer of the building can use it with the best results." We quite agree with Mr. Cole in thinking that practical electricity is a subject which the architect of the future will have to study, and that it ought to form part of an architectural student's curriculum.

**T**HE work of re-arranging the vast collection of Greek vases in the Louvre Museum,—a re-arrangement long sadly needed,—is now progressing rapidly. M. Edmond Pottier, who has charge of this important labour, has adopted a somewhat independent line: he has decided to arrange the vases geographically. He maintains,—and there is much to be said for his view,—that any intelligent observer can for himself classify the vases according to their shapes, or even, after a little training, according to their styles. Their geographical provenance

can, on the other hand, only be known by reference to catalogues, and in the case of such museums as the Louvre,—where at present no printed catalogue exists,—by reference to archives not always easily accessible on the spot. His principle is, indeed, to assist the mind just where it is least assisted by the eye,—to emphasise what is least obvious. Such a method of classification is, of course, rendered specially laborious in the case of vases, as the place of discovery and the place of fabrication differ so widely,—specially laborious also in a collection like that of the Louvre, based largely on the old Campana Museum, in the case of which record of "provenance" is often unsatisfactory. Archaeologists will look eagerly,—though in the case of so heavy a piece of work they may have to look long,—for M. Pottier's forthcoming catalogue, in which his system will take permanent shape.

**S**TUDENTS of Greek ceramography at Paris have certainly every advantage. They have not only the advantage of the new arrangement of the collection, but within the very precincts of the Louvre—in the Cour Lefuel—they have M. Pottier himself lecturing week by week on the subject, bringing to his work not only the experience of his recent stay at Athens, but also that touch-and-handle knowledge of the subject that only the director of a large museum can ever have. It is certainly a heavy tax on the energies of one man to be at once investigator, conservator, and expounder of antiquities, and we are assuredly not of those who maintain that it is part of the function of a museum official to popularise. But M. Pottier's lectures are not intended to be popular. They are addressed to, and largely attended by, a body of working students. The gain to such of this intimate museum contact is invaluable.

**T**HE Stuart Exhibition, at the New Gallery, is one of great general and historical interest; but, as will be readily understood, the artistic value of the collection, which is the main interest for us, is not, for the most part, very high. The majority of the portraits and portrait groups are stiff and flat productions, by painters of little name or fame, and in a great many cases there is no known painter's name at all. Here and there we come on a fine Vandyck, such as the half-length of Charles I., No. 68, which is a remarkably fine specimen of the painter; and that of "Prince Rupert and Prince Maurice" (80). To the artistic visitor the chief interest is in the articles of personal use or adornment,—armour, bijouterie, books, &c. Among these is a superbly illuminated small "Book of Hours" (case B, 316), said to have been used by the unfortunate Mary Stuart at her last devotions at Fotheringhay; a silver draught-board, formerly her property, very richly ornamented; the "leading-strings of James VI.," worked by Queen Mary, an interesting curiosity and an excellent bit of embroidery; a gold watch made for James I. (case G, 421), rich in decorative effect; a large ivory tankard, carved in low relief, with great spirit, with a scene representing the landing of Charles II. at Dover (case H, 465); and a remarkable target, lined with leopard skin, covered in front with leather and studded with silver ornaments, with a Medusa's head in the centre (case J, 586); this is said to have been made in France for Charles Edward, and to have been used by him at Culloden. There are a good many other articles which combine artistic and historical interest, about which we may have more to say; at present we have not space for more than this brief note.

**T**HE "Programm" published year by year on the day of the Winckelmann Festival, by the Archaeological Society of Berlin, always contains valuable archaeological material, and commands the attention of specialists. The eighty-fourth of the series (just published for 1888) has special claims on the attention of the educated public in England. It is by Dr. Paul Herrmann, and deals in detail with

the excavations in the tombs of Marion in Cyprus ("Das Gräberfeld von Marion auf Cypern"). What the British Museum has gained by these excavations is well known. The accession of the polychrome alabastron with the new signature of Pasiades, and the beautiful lekythos with the slaying of the Sphinx by Edipus, was duly chronicled by the *Classical Review*, and both have since been published with a commentary by Mr. Murray in the "Journal of Hellenic Studies" (1887, pl. lxxxi. and lxxii., p. 317 ff.). Perhaps, however, few in England know much of the discoveries beyond these two incomparable specimens. The great mass of the antiquities found had, unhappily, to be put up to public auction in Paris, and the only collective memorial of them has hitherto been the sale catalogue, published by Fröhner, a work of slight scientific value. Some important specimens were bought by Berlin, and to Dr. Herrmann was entrusted the work of arranging and cataloguing these,—hence his present monograph, which is based on a conspectus as complete as possible of the whole material. It is illustrated by plans, woodcuts, and three phototype plates.

**D**R. EDWARD THRAEMER'S book, "Pergamos," just published, supplies a want long felt. It deals, not, indeed, directly, with the fascinating subject of the recent Pergamene discoveries, but with the mythology and early traditions of Pergamos, a knowledge of which is the necessary preliminary to the study of the discoveries themselves. It is fast becoming better and better understood that the art of a country, which, for the ancients, is practically nearly coextensive with its mythography, cannot be fully understood without the study of its mythology, and *vice versa*. Dr. Thraemer is well-known to archaeologists even in England by his articles in "Roscher's Lexicon," articles which we have no hesitation in saying are the best that have appeared in that admirable publication. Those who cannot judge of mythological evidence at first hand may safely trust in him. It would be out of place to review in detail here a book whose connexion is with literature in the first, with art only in the second place; but we may call special attention to the chapter II., 1, which deals with the deities worshipped in the Acropolis precinct of Pergamos, and II., 3, which deals with the mythology of the lesser Pergamene frieze.

**E**XPERIMENTS relative to the influence of the quantity of water used in mixing mortar have shown, according to the *Annales des Ponts et Chaussées*, that cement mortar mixed with a large excess of water does not set so quickly, but assumes about the same hardness in the course of a few months as mortar to which the usual quantity of water has been added. On the other hand, a mortar mixed with very little water, and which consequently forms a stiff paste, sets very quickly, its degree of hardness being much greater in a short time than mortar mixed with a normal quantity of water. Cubes made of mortar of normal consistency, however, are nearly twice as hard after two years as those made of mortar in the mixing of which very little water has been used.

**A**S our readers will remember, there was a scene got up by the irrepressible Mr. Judge at the Metropolitan Board of Works the other day about their dinners at the expense of the ratepayers. It appears that there is another member of the Paddington Vestry, Mr. J. Blackwood, who takes a strong view as to this proceeding, and has sent round a circular to the ratepayers of Paddington protesting against this indulgence at their expense, and trusting that the Vestry will support him in a motion of which he has given notice, with a view to putting a stop to "this feasting." He adds, "How necessary this is will be seen from the menu of the last dinner, of which I received a copy, and print on the other side of this card." The record of the composition of the Metropolitan Board of Works' dinners at



the ratepayers' expense may be an interesting matter of history when the Board has ceased to exist. There is, however, nothing very alarming or luxurious in it, and one may conclude that the Vestryman who is so much impressed by it is a gentleman of simple habits and not accustomed to dine in French. As a matter of fact, also, it was not the Board of Works *en masse* that dined, but a Committee of the Board, though, from all accounts, it appears to have been a committee which was generally remarkably well attended; and we quite agree with Mr. Blackwood that the dinner never ought to have been charged to the ratepayers, and that to do so was a proceeding quite unworthy of a public body in the important position of the Metropolitan Board of Works.

#### THE ENGLISH IRON TRADE IN 1888.

THE past year, which was ushered in under more favourable auspices than several of its predecessors, has not belied the anticipations formed when it opened. On the whole, it has been a very prosperous year, and although this assertion ought to be somewhat qualified when we speak of the iron trade by itself, the course of business in that branch of industry has been of a remarkably even nature. There was a depression about the middle of the year, but its close finds the great staple industry of this country in a better position than at its commencement. This must be considered eminently satisfactory, for 1887 was a better year than the three which preceded it, and 1888, as has been observed, is an improvement upon its forerunner. One of the most gratifying features of last year is the emancipation of the English iron trade from the United States, the shipments to which decreased to about half their volume, the loss thus incurred being compensated for by the expansion of trade in other directions. This fact shows that the efforts of English manufacturers to keep their hold upon foreign markets, reference to which was made in our review last year, have been extremely successful. Another good feature of 1888, and to which the satisfactory nature of the past year's trading is to a great extent due, is the prosperity of the shipbuilding trade, leading to demands upon manufacturers of ship material which they were almost unable to meet. Briefly stated, the iron trade was brisk at the opening of the year, and reached its lowest ebb about June, when a flood-tide set in which will carry it well on into the year 1889. Prices following the curve thus described, there were absolutely no violent fluctuations.

The Board of Trade Returns for 1888, at least for the first eleven months of the year, are such as no one, unless he be an habitual croaker, could find fault with. They show a slight falling-off (about 120,000 tons) as compared with those of 1887, the figures for the corresponding eleven months being 3,711,523 tons and 3,796,665 tons respectively. On the other hand, the value of our iron and steel exports indicates an increase of quite one million and a half sterling, being 24,306,099, in 1888 and 22,808,851, in 1887, the growth being due partly to the better prices obtained, partly to the character of the exports, more manufactured and more highly priced products being sent away than lower-priced crude materials. Besides this increase in the value of our exports, the home consumption, when the figures are available, will undoubtedly show a large expansion, to judge by the busyness of the iron and steel works for the greater part of the year. We believe the position of the iron trade would be still better if it were not for the enormous stocks of pig-iron in hand. In this respect Scotland is the chief cause of trouble, and it speaks well for the elasticity of trade that so little injury has been done to it by those accumulations. The stocks of pig-iron in Scotland, both at Connal's store at Glasgow and in makers' yards, amounted on December 25 to 1,244,433 tons, against 1,228,040 tons at the corresponding date in 1887, which is an increase of only 16,393 tons on the year. Owing to a large local consumption, stocks in makers' hands have decreased, but the increase in Connal's store amounts to 88,612 tons. The picture with regard to the stocks of Cleveland iron is much more pleasant, for there we see a decrease in stocks of about 170,000 tons, with a production increased from 2,508,184 tons in 1887 to 2,615,000 tons in 1888, showing the consump-

tion and shipments combined to have been nearly 900,000 tons larger in 1888 than in the year before it. It is when dealing with such facts as these that the improved position of the iron trade at the close of 1888 will be fully realised, quite independently of the influence of the higher prices now ruling.

In Scotch pig-iron warrants the highest price of the year was 43s. 6d. (on January 4), and the lowest 37s. 1d. (in May), and between these two quotations prices have fluctuated during the year, the market, always a sensitive one, owing to the speculative nature of the business carried on there, being oppressed by the heavy stocks in Connal's store, which in June reached one million tons, and have since slowly but steadily crept up. The closing price of warrants was 42s., so that a recovery of 5s. from the bottom price of the year was made, while on the whole year there has been a drop of 1s. 6d. a ton. Middlesbrough iron has been the gainer by about 1s. a ton. In January, No. 3 G.M.B. was 32s. 6d., and reached its highest price (34s. 7d.) in September. Between these two months it had dropped to 31s. 6d., and it closed the year at 33s. 6d. to 33s. 9d. It is certainly remarkable that Bessemer iron in the north-west of England, of which there has been such a greatly increased demand for the manufacture of steel, should have lost 2s. on the year; but it would appear that over-production has a large share in its depreciation. Mixed parcels of Bessemer iron were quoted 47s. in the first month of the year, but by midsummer it had gone down to 42s. In July, it rose to 42s. 6d., in August to 43s., and in September to 45s., at which price it remained in October, losing 6d. a ton in November, and closing the year at 45s. In other districts where crude iron is produced, pig followed the curves of depreciation and improvement noted in the three centres referred to, the close of the year finding Lancashire pig-iron advanced 1s. 6d. a ton, and Staffordshire 2s. 6d.

A great impulse was given to the finished iron trade by the demand made upon it by shipbuilders, as well as by increased exports. In Scotland the consumption was so well sustained that manufacturers were able to advance prices of bars rapidly 15s. a ton from the bottom price of the year, and even in the last week of the year there have been further advances ranging from 2s. 6d. to 5s. a ton. In the North of England there has been an increase in price as steady as the growth of consumption, the bi-monthly returns of the Board of Arbitration showing a uniform rise. For the first two months of the year the average selling price per ton of iron plates, angles, bars, &c., was 47. 13s. 1d.; in the next two months it rose to 47. 13s. 6d.; next to 47. 13s. 10 3/4d.; then to 47. 14s. 2 1/2d.; and finally (that is to say, for September and October) to 47. 16s. This shows a gain of 3s. per ton on the year, and it is most likely that the returns for the last two months of the year will present a further advance. Best marked bars in Staffordshire have been almost uniformly quoted at 77, but during the last two or three months they have been selling nearer 77. 10s. Common bars have gained 17s. 6d. on the year, the price in the first quarter being 47. 12s. 6d. to 47. 17s. 6d.; in the second, 47. 15s. to 57.; in the third, 57. as a minimum; and in the fourth, 57. 5s. to 57. 10s. Black sheets for galvanising have recovered 15s. a ton. Singles were at first 67. 5s. and 67., but they became stronger subsequently on the formation of a syndicate of the South Staffordshire iron sheet makers, improving from 5s. to 10s. per ton in the third quarter of the year, and in the last quarter another 10s. Manufacturers of finished hardware began the past year badly, and as their business is influenced to a great extent by the metal market, the fluctuations in the latter during the year by no means improved their position. But, under the effects of an expanding trade, a better tone began to prevail, and at present their prospects are brighter than at any time during the past twelve months. Prices, which were low and unremunerative at the beginning of 1888, are now much higher and still improving. Tinplate manufacturers cannot be said to have had a good year. They fared particularly badly during the early months of the year, when, with the price of tin inflated to an abnormal degree, they had to complete contracts taken at a time when tin was 75 per cent. lower in value. But even when tin had sunk again to a more normal level, and although their order-books were well filled, it was impossible

for them to realise better profits, the capacity for production being so large. Notwithstanding that shipments of tinplates have been beyond precedent, the close of the year finds the price per box at least 2s. lower, on the average.

The steel trade has made immense progress during the past year, the advance being due, in a great measure, to the large consumption of shipbuilding material, but also to the heavy production of steel rails, mostly for foreign requirements. The needs of users of steel have been so great that producers at times have been unable to cope with the demands made upon them. The steelmakers of Scotland have been doing exceedingly well, and the prices obtained by them have been remunerative. Steel shipplates were in January 77. 10s., and they are at the same price at present, but they were at one time as low as 67. 7s. 6d. Although the steel works in the North of England were never idle, there have been great changes in price. They commenced the year at 77, at which price they were also sold in December, but in the interval they were quite 20s. a ton less. A very large trade in steel has been done in the north-west of England, especially in rails, yet prices have varied a great deal. Plates have risen only 5s. on the year, being 77. 10s. at its commencement and 77. 15s. at its close, and at one time (in June) as low as 77. There have been remarkable fluctuations in the price of steel rails in the north-western district, although the demand was good, and they are now 3s. a ton lower than they were in January last, being 37. 19s. 6d. against 47. 2s. 6d. Rails are fetching rather better prices in the north of England, 47. 2s. 6d. being the value at the beginning and end of the year; but they have been 10s. below that price. The trade of Sheffield varied with the changing fortunes of trade in other districts, at least so far as the staple trades of the town are concerned. But one important branch—that of heavy steel castings—showed a steadily increasing activity throughout the year. A successful commencement was also made with the manufacture of corrugated boilerflues by a firm which, by reason of the slackness in its special line, that of armourplates, was induced to adapt its plant for the purpose. The production of crank axles and large forgings likewise promises to compensate for the trade Sheffield has lost in other departments.

As in 1887, shipyards were the principal customers for iron and steel also in the past year. What an impulse shipbuilding gave to the iron trade last year will be best understood when it is stated that the tonnage launched in 1888 was nearly double that of the previous year, the figures for last year being 903,887 tons, against 578,663 tons in 1887. Of the tonnage of 1888, the lion's share falls to the north-eastern ports (506,897 tons), the launches in the Clyde district amounting in the aggregate to only 280,037 tons. No other shipbuilding centre in the kingdom at all approaches those immense totals, the next highest being Belfast, with the modest total of 35,495 tons. The early part of last year was a busy time for shipbuilders, and this activity continued up to July, when the improvement in the freight market induced shipowners to give out additional orders for new vessels—a tendency which prevailed pretty nearly to the end of the year. The result is that shipbuilders have had their order-books filled to such an extent as to give them good cause for looking with confidence into the immediate future, the demand for tonnage still exceeding the supply. The engineering trades have been steadily improving throughout the year; but depression had prevailed so long in that department of trade that it took some time before the effects of the revival were really felt, while the year had far advanced before manufacturers were able to secure those advances in prices to which they were entitled by reason of increased activity and the rise in the materials used by them. Naturally, marine engineers were the first to benefit, but activity is now the rule in almost every branch of engineering, stationary engine builders, machinists, and boiler-makers, being especially full of work. Locomotive builders alone are slack, but the outlook for the new year has improved.

The year's prosperity is amply displayed by the better employment of labour, and at the present time there can be only a very small percentage of unemployed workers, while in some branches of trade the demand for labour exceeds the supply. It follows, as a matter of



course, that the workmen have had their share of the advance in prices. With the improving condition of the trade, agitation set up for a revision of the wages scale. In some cases the workmen exacted the full pound of flesh, while in others compromises were effected which, we trust, were satisfactory alike to masters and men. At any rate, no serious disruptions took place in their relations, which must be equally gratifying to those upon whom fall the evil consequences of strikes. Taking it all in all, the experiences of the past year may be said to have fulfilled the anticipations formed at its opening. As to the future course of business, the prospect is extremely favourable. Unless there should set in another craze for over-production,—a danger to be feared in prosperous times,—there is no reason why 1889 should not be at least as good a year as that of which we have just seen the close.

## LETTER FROM PARIS.

SOME months ago M. Lockroy removed from his office, for political reasons, the architect to the Palace of Versailles,—M. Leclercq,—and transferred him, as a kind of mark of disapproval, to the less important position at Rambouillet; and similar motives appear to have induced him to recall the eminent architect at Mont St. Michel,—M. Corroyer,—to whom the Government nineteen years ago confided the restoration of that important national monument; but who, being suspected of "clericalism," is found unworthy to serve his country professionally.

This is an iniquity which is the less pardonable on the part of a Minister who is a man of sufficient general education to know and understand the value of M. Corroyer's professional services. M. Corroyer, in a justly-indignant letter addressed to the Directeur des Beaux Arts, points out that in the work he is carrying on to put Mont St. Michel in a state of safety and durability, he has been successively supported by MM. Charles Blanc, Chennévières, Turquet, Paul Müntz, Kaempfen, and Castagnary, none of whom certainly were clericalists, but who never regarded such subjects from a political point of view. At the close of his letter, M. Corroyer says:—

"J'ai attaché mon nom au Mont St. Michel de telle façon que rien ne pourra l'en séparer. Maintenant je reprends ma liberté d'action et je me réserve de pour suivre en toute indépendance une étude qui aura, j'espère, l'approbation de mes confrères (ont les doctrines sont les mêmes et qui, menacés aujourd'hui par les mesures arbitraires dont je suis l'objet, sont aussi surpris que moi des théories professées en pleine assemblée par des gens qui n'ont pas, à notre avis, l'autorité qu'il faudrait en ces matières."

It is almost unnecessary to add that this unexpected step has been much resented by M. Corroyer's professional colleagues, who all profess the greatest regard and respect for him. His successor in the post is M. Petitgrand, an architect attached to the Commission des Monuments Historiques, who has directed some important works of restoration already, especially at the cathedrals of Bay and Sées, the churches of Louveciennes, Champsagne, &c., and made a number of drawings for the archives of the Commission. It is much to be lamented that the functions of Government architecture should thus be subject to interference from mere political jealousy; and that men who are giving their whole lives to artistic work should be liable to be dismissed like domestic servants.

The Municipal Council has decided at last the great question of the decoration of the Hôtel de Ville, and work will shortly commence all along the line. We have already from time to time mentioned the selection of artists for various portions of the work made by the special Committee; and as this has been ratified by the Council without any alterations, there is no occasion to say anything further on that head. The Council has wisely left it in the hands of the same Committee which made the selection to overlook the work and receive the paintings, as well as to act as judges in the public competitions, by which some portion of the commissions have still to be decided. The total cost of the work will be 2,600,000 francs, payable in seven annual sums of 355,000 francs each. The direct commissions amount to 1,341,000 francs, the works put out to competition to 480,000 francs, and the materials, preparations, scaffolding, &c., stand for an amount of 510,000 francs.

Although it is much too late for the principal work for the decoration to be prepared, even in the form of cartoons, for the approaching Exhibition, it is hoped that some of the panels of figures, and the landscapes intended for the decoration of the smaller saloons, may be exhibited.

A competition was decided a few days ago, set on foot by a French journal, the *Courrier Français*, for a statue to Lazare Carnot, of the Convention, the grandfather of the President. Fifty artists took part in the competition, and the design chosen was that by M. Turcan. Prizes were adjudged to MM. Bourdelle, Charpentier, Fulconis, Beylard, Louis Noël, and Paul Choppin. According to the terms of the competition, M. Turcan must exhibit his completed work in this year's Salon. The choice made by the jury is a good one. M. Turcan is a thoughtful and original artist, who makes his own creations. His best contributions to the Salon exhibitions have attracted much notice; many will remember his "L'Aveugle et la Paralytique," and he is an artist from whom we may expect a masterly work.

Among commemorative monuments which are actually in course of execution is that by M. Barrias, the sculptor, to the memory of Guillaumet, the painter of Oriental subjects. This will represent a young Arab girl leaning her hand on the plinth of the monument and scattering flowers. The sarcophagus bears a medallion portrait of the deceased painter. It is announced also that a group of artists who were friends of the late M. Castagnary are organising a subscription for the erection of a monument to his memory in the cemetery of Montmartre, where he is buried.

The Municipal Council have decided to accept for the city the offer of M. Pulitzer, before referred to, to erect in a public place in Paris (most probably in the Place des Etats-Unis) a group offered by an American Committee, and representing Washington and Lafayette. M. Bartholdi will shortly commence a model for it.

The Société Centrale des Architectes has elected its council for 1889. M. Chas. Garnier has been named President, in place of the venerable M. Bailly; MM. A. Normand and E. de Joly are Vice-Presidents. M. Eugene Monnier retains office as chief secretary, with M. E. Levit as assistant-secretary, and M. F. Roux as editing secretary. M. Baillin is named keeper of the records (*archiviste*); M. Simon Girard, treasurer. MM. Bailly, Daumet, and Achille Hermant are entrusted with the duties of *censeurs*; and those of delegates are undertaken by MM. Bartomiaux, P. Wallon, Deslinières, Héret, Bayard, Guadet, Sédille, J. Hermant, Bonnet, and Eugene Saint-Père.

Various competitions have been decided at the Ecole des Beaux-Arts. That of the work of the upper class, whose subject was "Une Manufacture Nationale de Tapisseries d'Art," comes first. Among sixty-one designs, the jury have awarded the first medal to M. Bertone, and second medals to MM. Toulouse, Bépierre, Derpethes, besides twenty-nine "premières mentions." For the sketch competition, the subject was "Un Siège Episcopal pour la Chœur d'une Cathédrale." Among forty-seven competitors, the jury awarded "secondes médailles" to MM. Bertone and Breffendille, and "premières mentions" to MM. Jost, Dumesnil, and Eustache, as well as six "secondes mentions."

For the Achille Leclaire competition, which is just opened, the Académie des Beaux Arts has chosen as the subject, "Un monument commémoratif à ériger dans l'intérieur du Pantheon, en l'honneur des Français ayant illustré leur Pays." There is certainly a subject which rises above the ordinary commonplace of Academical competitions! The designs were to be sent in on the 23rd of December, and the award is to be given on the 9th of March next.

The new iron bridge of the Rue Caulaincourt, crossing the cemetery of Montmartre, has since a few days back been opened to the public. The number of passengers and vehicles constantly moving across shows how much the road was required which M. Alphand projected twenty-five years ago, and has now succeeded in having carried out. The bridge was opened with official ceremony on the 16th of December, and the same day the Prefect of the Seine laid the first stone of the new Mairie of the 18th Arrondissement (Montmartre). This building, of which M. Varcollier is the architect, is to be built on a rectangular plot, bounded by the Rues Hermel, Montcoenis, and Ordener; the principal façade will face this latter street.

A new Mairie is also to be shortly started for the 10th Arrondissement, at the angle of the Faubourg St. Martin and the Rue Château d'Eau. For this a competition will be opened.

Another strike has interrupted the work on the Eiffel Tower; but the stoppage this time was very short, and the strikers re-entered spontaneously on their work, on the condition that the managers and provokers of the strike should be dismissed. Naturally M. Eiffel made no difficulty in accepting these terms, and work is going on harder than ever, partly in preparation for an official visit of M. le Président in February.

A fine portico has been erected at the entrance to the foreign section of the Exhibition; it is formed of a series of arches surmounted with the arms of England, and has been executed in England and erected here by English workmen. The whole has a fine architectural effect.

To the list of curiosities of the Exhibition we must now add the Forestry Exhibition, which is to be in the Trocadéro, but the main portion of which is actually in construction in the Forest of Fontainebleau, after the designs of M. Leblanc. The chalet, which is costing 110,000 francs, will cover a surface of 43 by 37 metres, and will be entirely composed of wood cut in the forest, and neither planed nor shaped. It will be formed in bays of unbarked wood of varying forms and colour, and the roof also will be in wood. The great variety of species of trees that grow at Fontainebleau will enable the designers to give a very artistic and picturesque effect to this rustic edifice.

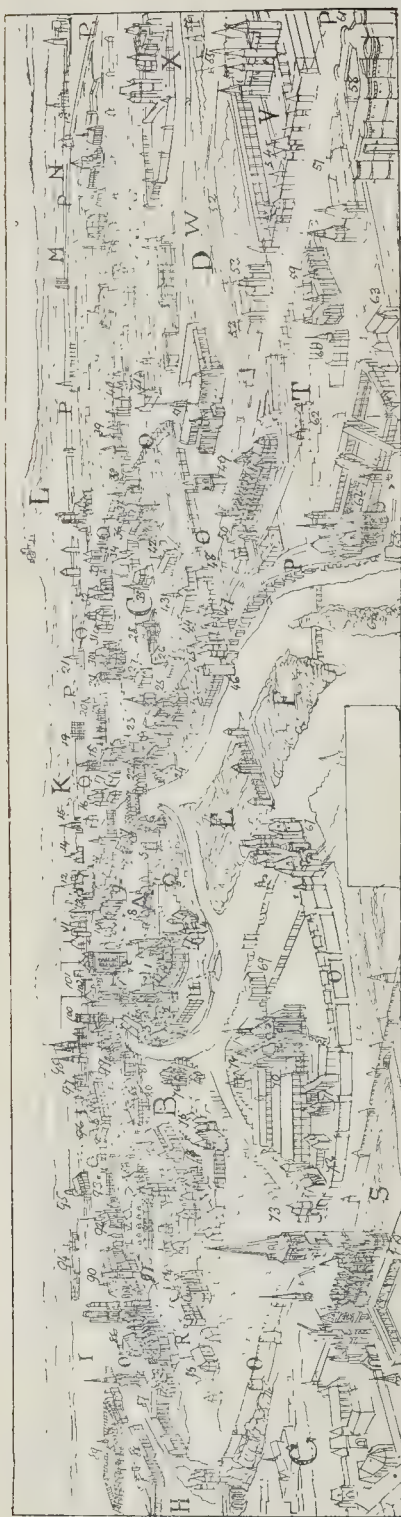
A good many private exhibitions have been open during the last few weeks of the year. Among the most interesting may be mentioned that of M. Paul Lazerges, the orientalist painter, who has desired for the last time to present to the public an exhibition of his collected works, which consists of eighteen pictures and a number of studies. They afford some remarkable examples of studies in colour-effect. M. Lazerges has a perfect acquaintance with Algeria, whence he has drawn many subjects for pictures, which have always attracted attention in the Salon exhibitions. We may mention especially "Femmes Kabiles portant des herbes," "Une rue de Bidah," "Une Caravane dans les Dunes," and "La Baie d'Alger au clair de lune."

The death is announced of the painter Ferragio, at Paris, at the advanced age of eighty-four. He was born at Marseilles, and studied in the *atelier* of Gros, but failed to win the Prix de Rome in 1833, and turned towards drawing and lithography, in which he had more success. His albums of models have become classics in school instruction in drawing. He produced also a great number of water-colours, pastels, &c., of which many have figured in recent Salon exhibitions.

There has been another sudden death among the municipal corps of engineers of Paris; that of M. Allard, "Directeur de la voie publique, des promenades, des plantations, et de l'éclairage." He is the fifth engineer of eminence whom the administration has lost in the space of three years, and was one of the last representatives of the eminent corps of engineers who contributed so largely to the embellishment and sanitation of Paris. M. Allard was born in 1852; he passed through the course of the Ecole Polytechnique, and thence entered the "Ecole de Ponts et Chaussées," which he quitted in 1867, with the grade of "Ingénieur Ordinaire." He entered the service of the municipality in 1864, was made Ingénieur-en-Chef in 1878, and directed, among other large works of public improvement, the construction of the Boulevard Malesherbes, the Boulevard St. Germain, and the Avenue de l'Opéra. He was promoted subsequently to the rank of "Inspecteur-Général," the highest rank attainable in the career of a French Government engineer. His death leaves a great gap in the Direction des Travaux, at Paris; he was one of the most energetic and experienced of the agents who have worked under M. Alphand, who has successively seen all his principal collaborators disappear.

**New Year's Honours.**—In the list of "New Year's Honours" occur the names of Sir Frederick Bramwell, to be created a baronet, and of Mr. F. W. Stevens, of the Public Works Department, Bombay, and architect of the new Railway Terminal Buildings, which we illustrated a little while back, who receives the order of Companion of the Indian Empire.





KEY TO LARGE PLATE. - PARIS IN THE TIME OF FRANCIS I.

- A. La Cité  
B. L'Université  
C. Le Palais  
D. Le Palais  
E. Le Palais  
F. Le Palais  
G. Le Palais  
H. Le Palais  
I. Le Palais  
J. Le Palais  
K. Le Palais  
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M. Le Palais  
N. Le Palais  
O. Le Palais  
P. Le Palais  
Q. Le Palais  
R. Le Palais  
S. Le Palais  
T. Le Palais  
U. Le Palais  
V. Le Palais  
W. Le Palais  
X. Le Palais  
Y. Le Palais  
Z. Le Palais
1. Notre Dame  
2. Bishop's Palace  
3. St. Germain  
4. St. Germain  
5. Tower of Duguescl  
6. St. Germain  
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100. St. Germain
54. Hospital of St. Jacques du Haut-Pas  
55. Chartreuse (Carthusians)  
56. St. Julien (Dominicans)  
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## Illustrations.

## PARIS IN THE TIME OF FRANCIS I.

THE buildings shown in this restoration, by Mr. H. W. Brewer, of the aspect of Paris in the time of Francis I., are described in the first article in this issue; and a key to their names is appended on this page.

## THE IMPERIAL INSTITUTE.

WE gave a view of the selected design for the Imperial Institute, by Mr. T. E. Colcott, at the time of the competition. The present illustration, however, is reproduced from a larger and finer drawing, and on a larger scale, and includes also some final modifications in the upper portion of the tower, made since the design was accepted in competition.

The drawing from which the illustration is taken was exhibited in the Architectural Room at the Royal Academy, last year. As the best illustration that has yet been made of the most important building in progress in England at present, we thought it an exceedingly good subject for the first number in a New Year. We have to thank Mr. Colcott for kindly lending the drawing for illustration.

## THE MONUMENT TO GAMBETTA, PARIS.

This monument was the result of a public competition. It has been erected in the Place du Carrousel, on the axis of the ancient Palace of the Tuilleries, and opposite the Arc de Triomphe, constructed under the First Empire before the railings of the Palace.

The designs appear to have been each produced in the competition by an architect and a sculptor acting in concert. Those who were invited to join in the second and final competition were the following:—

| Architects.       | Sculptors.    |
|-------------------|---------------|
| M. Faure Dojarrie | M. Dalou,     |
| M. Pujol          | M. Falguière, |
| M. Lambert        | M. Coutan,    |
| M. Boileau        | M. Aubé,      |
| M. Laloux         | M. Tujalbert, |
| M. Dutert         | M. Allar.     |

The result was that M. Boileau was commissioned to execute the architectural portion of the work, and M. Aubé the sculpture.

M. Boileau had exhibited no less than four different designs, with various more or less allegorical ideas and varying architectural arrangements.

The one executed, and which forms the subject of the engraving (by Mr. J. D. Cooper) published with the present number, has been considerably modified in execution, and, in fact, includes details adapted from the architect's other three designs.

The monument, which was inaugurated in July last year, measures nearly 19 mètres in height without the crowning group; the figure of Gambetta himself is 3½ mètres in height. It is a fine and energetic figure, but being in the same stone as the pyramid or stele behind it, hardly detaches itself sufficiently from the background. The pyramid is almost entirely covered with inscriptions from the writings of Gambetta or from the most remarkable of his speeches.

The two large figures seated at the base, to left and right, represent respectively "La Force" and "La Vérité." On the opposite face from the spectator there is a decorative group of "attributes" and garlands, &c. Two seated figures of children holding each other's hands represent "L'Égalité," and two sculptured heads on the pyramid represent "La Fraternité." All these are in bronze, as also the figure of "Democracy" seated on a lion, which forms the crowning group.

It was at first intended to have placed the monument at the junction of the boulevards of Belleville and Montmartre, on the west of the Rue Oberkampf, a position suggested in reference to the popular and democratic origin of Gambetta's political career; but on the State consenting to grant the site on the Place du Carrousel, the previous idea of this rather out-of-the-way site was abandoned.

## LICHFIELD CATHEDRAL: WEST FRONT.

LICHFIELD CATHEDRAL, dedicated to the Virgin and St. Chad, though one of the smallest in England, is of especial interest, for at least two reasons. It is, namely, complete with three spires, and it has the feature so excep-



tional in England of a polygonal termination to the choir. Its chief dimensions, as ascertained by Sir Gilbert Scott, are:—Nave, 139 ft. by 64 ft. 7 in., and 60 ft. high; choir and presbytery, 137 ft. 3 in. by 27 ft. 9 in.; transept, 149 ft. by 28 ft.; lady-chapel, 53 ft. 8 in. by 27 ft. 9 in.; height of the central spire, 249 ft.; and of the western spires 195 ft. The design of the west front somewhat resembles in its *motif* that of Wells Cathedral,\* and is something between the usual composition of a central gable with flanking towers, as at Canterbury and York, and the elaborate architectural screens of Lincoln and Salisbury. In this case the towers and spires form an essential part of the design, notwithstanding that the lower portion is treated on the other principle. The result, like that of most compromises, must be characterised as only moderately successful. There is a decided loss of character, as might be expected, emphasised by the prevailing horizontal lines of the lower portion and the vertical lines of the upper part contending to give the chief expression to the composition: the breadth of the one and the aspiring character of the other destroy one another. This failing apart, one must admire extremely the fine and rich design of the several series of niches and canopies, and the breadth and simplicity which the designer has contrived to combine with richness by contenting himself with small variations on one theme, instead of trying to show his cleverness and originality by mixing several. The west front, complete with its spires and arcading, dates from c. 1275. It was "restored" and all the absent and faulty figures in the niches were replaced in 1820-22, in Roman cement. Since 1877 a re-restoration in stone has been proceeding, but, as far as we can understand, no architect has been employed, and, apparently, the new figures have been placed, in most cases, with but little regard to any comprehensive system.

The illustration is reproduced from a fine drawing by Mr. Arnold B. Mitchell.

#### THE CLARENDON BUILDING, OXFORD.

This is reproduced from a pencil drawing by Mr. John Falleylove. For further remarks in regard to it see the article on "Illustrations of Oxford," in another column.

#### MEMORIAL BRASS TO THE LATE ARCHBISHOP TRENCH.

THIS memorial brass, which is 12 ft. in height, was fixed in the early part of last year in Christ Church Cathedral, Dublin, in memory of the late Archbishop. It is the work of Messrs. Heaton, Butler, & Bayne, from a sketch by Mr. Drew, R.H.A., the architect to the Dean and Chapter, and embodies arms, seals, and devices supplied from Dublin, and drawn in detail by Mr. R. C. Oppen. A sketch for the head of the Archbishop was contributed by Sir Thomas Jones, P.R.H.A.

The following Latin inscription is placed on it:—"In piam memoriam Ricardi Chenevix Trench, S.T.P., per annos xxi. Archiep. Dublin, qui fidem Christi sinceram, Antistes, Doctor, Poeta illustravit corde, coluit moribus, ornavit in vitam transivit ampliore ante diem v. kalendas Aprilis A.S. MDCCCLXXXVI. aetatis xxxix. Clerici sui et Laici posuerunt."

The figure of the Archbishop is vested in his customary robes, and stands under a crocketed canopy; above the head of the figure two winged angels bear on shields the arms of the dioceses of Dublin and Glendalough, and of Kildare respectively. The cross surmounting the tympanum of the canopy is a representation of the famous Cross of Cong. In niches in the upper part of the canopy are represented two typical bishops of the ancient church in Ireland, viz., St. Patrick bearing the Episcopal *Baculus* in its simple Irish form, and St. Laurence O'Toole bearing the crozier of an archbishop, the latter prelate being appropriately introduced in a connexion with such a monument in historic Christ Church Cathedral, as identified with the fusion of the Irish church with the English connexion, and the founder, with the English invaders, of this principal church of the principal see of the English Pale.

The inscription, as will be seen, is on a podium or panel beneath the feet of the Archbishop's figure. Among the devices introduced in this part of the design are the arms of Trench, with, as a pendant, the seal of the Abbey



Memorial Brass to the late Archbishop Trench.

Church of Westminster, of which Dr. Trench was for some years the Dean. Below are reproduced genuine representations of the seals of the Cathedral churches of St. Patrick, Dublin, the Holy Trinity of Christ Church, and St. Brigid's of Kildare. Lowest down, prominence is given to the arms of Archbishop Trench impaled with those of the diocese of Dublin.

The work is executed in a richly-toned brass "laten," an old alloy revived by Messrs. Heaton, Butler, & Bayne, as being for memorial purposes less liable to corrosion.

#### THE SLATE TRADE IN 1888.

TRADE has been fair, and inquiries good during the past year; but prices have been kept down by competition between the different quarries.

Prices for the 1st January, 1889, have at length been fixed.

At the Dinorwic and Penrhyn quarries a slight advance has been made in some of the large sizes.

At Carnarvon the present lists continue in force, the discounts being curtailed, and an arrangement is in progress to curtail them still further on the 1st of March, by which date it is anticipated that the stocks of small sizes will be entirely cleared.

At the Festiniog quarries prices of some sizes of best have advanced, but some of the mediums have been slightly reduced.

According to the last Government returns, there is an increase of over 10,000,000, value in the make of slates, and it is a remarkable fact that out of 1,050,000, the total value of slates produced in Great Britain, over 1,000,000, worth are quarried from the well-known Bangor and Festiniog veins, lying in a comparatively small area in Carnarvonshire and Merionethshire, and held by comparatively few companies or private individuals.

The export trade has improved very slightly, the protective duties in the United States being still heavy enough to crush any trade with that country.

For home use inquiries are good, and, with a slight improvement in trade, prices would advance considerably. The system of carrying on the slate trade has completely altered within the last few years; merchants, instead of keeping large stocks, now order by rail only when slates are actually required. This has also seriously affected the coasting trade, freights for some years having been so low that it did not pay to build vessels.

No new quarries have been opened during the year, but one or two small ones that had stopped have been re-opened, and the celebrated Palmerston Quarry has ceased to exist as an independent Company, having been absorbed by the Oakeley Company after a long and costly arbitration.

#### ROYAL ACADEMY:

##### ADMISSIONS TO THE ARCHITECTURAL SCHOOL.

MR. R. PHENÉ SPIERS, the Master of this School, sends us the following list of the January admissions of Students:—

##### Upper School.

|             |               |
|-------------|---------------|
| H. Baker.   | A. N. Wilson. |
| A. H. Hart. |               |

##### Lower School.

|                |                    |
|----------------|--------------------|
| J. W. Bedford. | A. M. Poynter.     |
| W. A. Penn.    | J. Rawlinson.      |
| J. W. Little.  | F. E. Smees.       |
| J. G. Oakley.  | E. W. Wonnacott.   |
| J. Paxton.     | P. C. Worthington. |

##### Probationers.

|                |                   |
|----------------|-------------------|
| H. P. Adams.   | R. B. Pratt.      |
| F. A. Coles.   | W. S. Taylor.     |
| A. W. Hocking. | A. F. Usher.      |
| W. C. Howgate. | H. A. Woodington. |
| H. E. Kirby.   |                   |

**New Synagogue for Manchester.**—The *Manchester Courier* says that operations will shortly be commenced for the erection of a new Jewish synagogue and Beth Hamidrash in that city. An eligible site has been secured in York-street, Cheetham, adjoining the Cheetham Branch Free Library. The structure will be erected from designs prepared by Mr. W. Sharp Ogden, architect, the contractors being Messrs. Robert Neill & Sons, Strangeways.

\* See *Builder*, Vol. IV., p. 213.





Lodge of—  
Charles J. Osborn Esq.  
Mamaroneck  
McKim Mead & White, Architects. N.Y.



Lodge to Private Residence at  
North Eastern  
Mass.  
H. H. Richardson  
Arch<sup>t</sup>

Two American Lodges.

#### TWO AMERICAN LODGES.

THESE illustrations speak for themselves: they are examples of picturesque treatment of unpretending lodge architecture. One of them is by the late eminent American architect, Mr. H. H. Richardson.

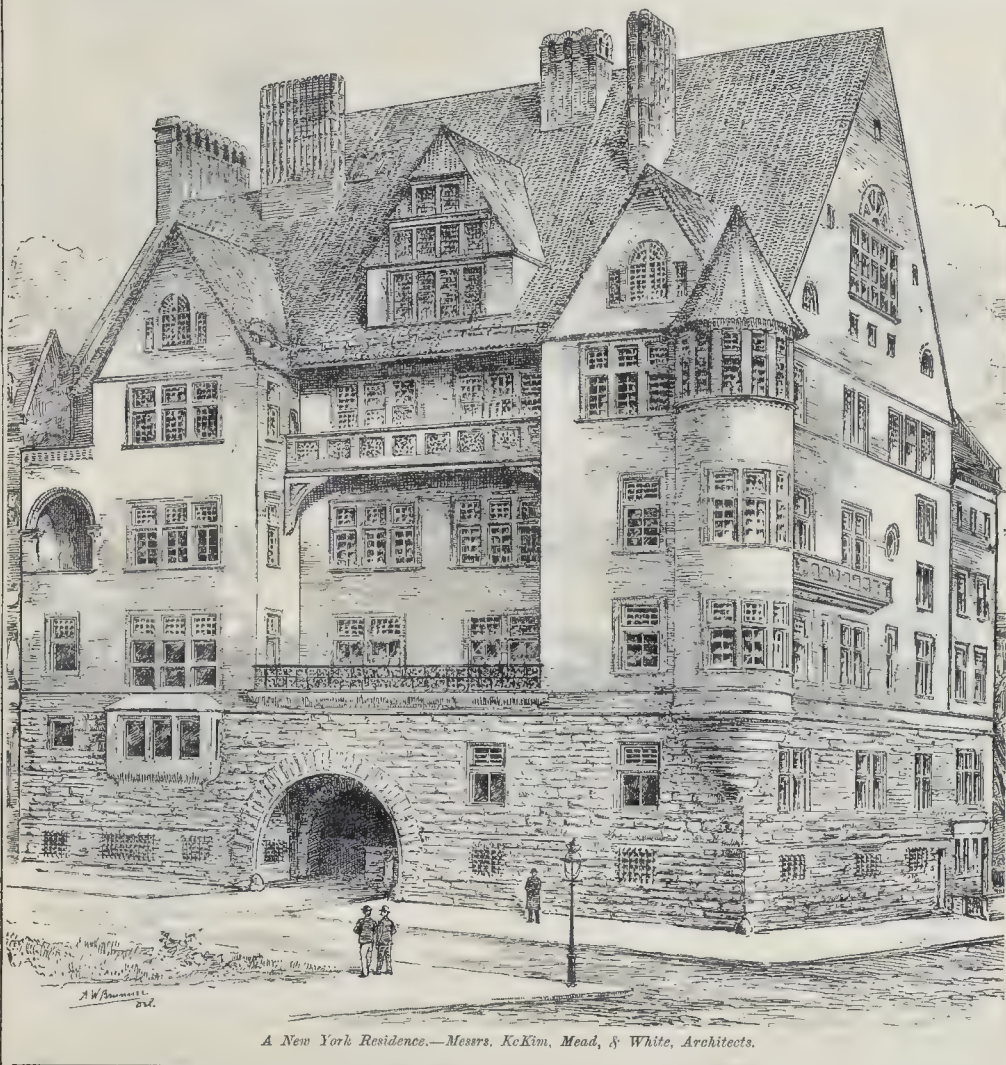
#### A NEW YORK MANSION.

THIS rather remarkable-looking house, which not many years since would have been supposed to come from any part of the world rather than the United States, was built from the designs of Messrs. McKim, Mead, & White, and stands at

the corner of Madison-avenue and Seventy-Second-street. It was built, we believe, to accommodate several families of relatives, and is of very large size for a street residence, fronting 100 ft. each way.

The great archway in the rusticated basement leads to a central court lined with glazed brick.





A New York Residence.—Messrs. KcKim, Mead, & White, Architects.

The wall above the basement is of brick, which appears to have been specially made of thin proportions, and somewhat like Roman brick. The general colour of the walls is a kind of golden brown, but not uniform, uniformity of colour being rather purposely neglected.

#### COMPETITIONS.

**Castleford Board Schools.**—We are informed that at a meeting of the Castleford School Board, held on Dec. 31, the plans submitted in competition for the proposed new schools in Temple-street were under consideration. It was decided to adopt those sent in by Mr. William H. Thorp, A.R.I.B.A., of Leeds. The building is intended to accommodate 500 children, viz., 300 in the mixed school and 200 infants. The style of the proposed school is Gothic of a Romanesque type.

**Failures in 1888.**—According to *Kemp's Mercantile Gazette*, the "gazetted" failures in the building and timber trades in 1888 were 785, as compared with 761 in 1887, 712 in 1886, and 663 in 1885. It would thus seem that 1888 shows a bad pre-eminence. May the figures for 1889 be indicative of greater prosperity in the building trades.

#### LIVERPOOL ARCHITECTURAL SOCIETY.

In the *Builder* of the 1st ult. (page 392) we alluded to Professor Hele Shaw's intended special course of lectures in connexion with this society, and in view of the Examination in Architecture to be held in Liverpool by the Institute of Architects in February. We regret to learn that the necessary number of names (ten) were not forthcoming. But we are glad to see that Professor Hele Shaw has allowed Mr. Culshaw to issue the following circular referring to this usual Lenten course, and that it has met with a warm response. We are asked to say, however, that Professor Hele Shaw will be pleased to have some more replies. Communications on the subject may be addressed to him at the Engineering School, the University, Brownlow-street, Liverpool, or to Mr. Alfred Culshaw, Union-court, Castle-street, Liverpool. The following is the circular:—

University College, Liverpool.

#### ENGINEERING.

Professor H. S. Hele Shaw, M.Inst.C.E., M.Inst.M.E.

#### Materials and Construction.

A course of five elementary lectures will be delivered during the Lent Term as follows:—

- (1) Friday, Jan. 25, 8 p.m. The Properties and Preservation of Timber.
- (2) Friday, Feb. 1, 8 p.m. Iron and Steel.
- (3) Friday, Feb. 8, 8 p.m. Natural and Artificial Stones and Cements.

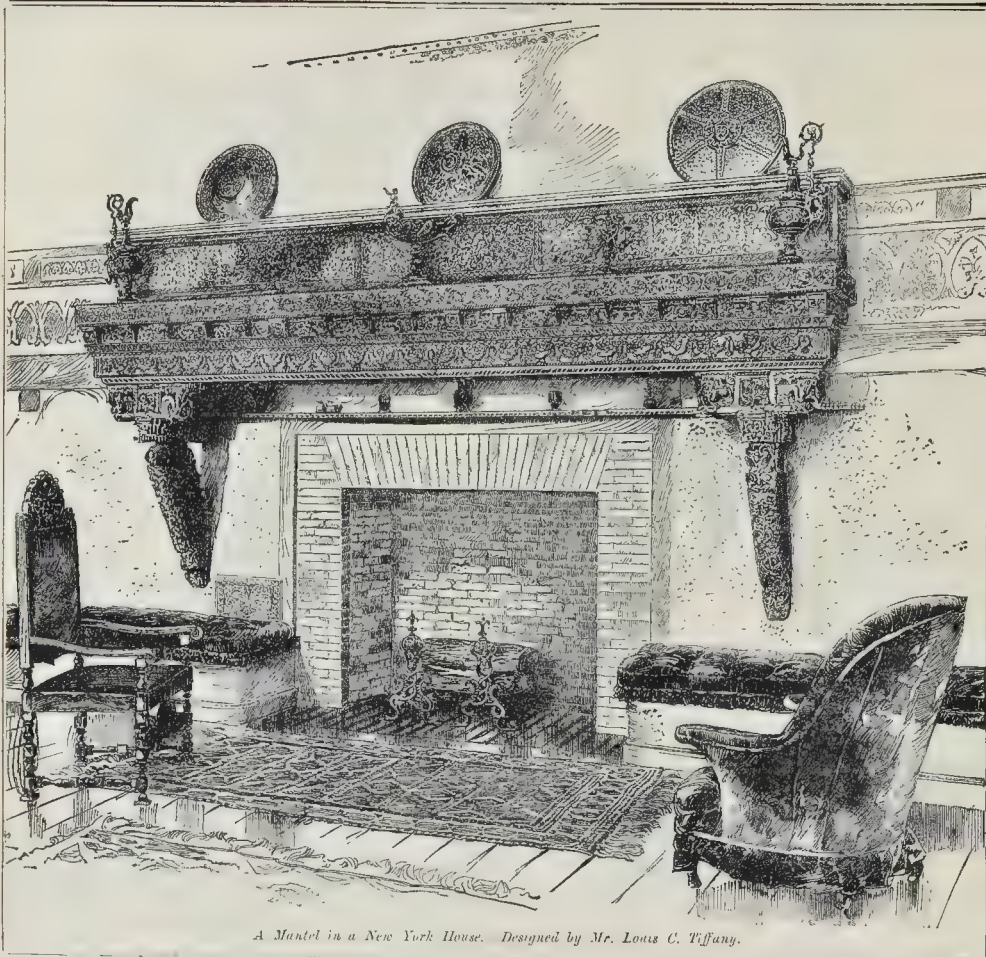
- (4) Friday, Feb. 15, 8 p.m. The Strength of Beams and Girders.
- (5) Friday, Feb. 22, 8 p.m. The Stability of Walls.

These lectures will be specially adapted for civil engineers, architects, and builders, and will cover, as far as possible, the ground of the Examination in these subjects of the Royal Institute of British Architects to be held in Liverpool at the end of February. At the same time, a very slight knowledge of technical details will be assumed, so as to make the lectures suitable for engineering students in general. Fee for the course, 5s.

#### The Art Union of London Print for 1889.

For their print for this year, the Council of the Art Union have secured the right to engrave a picture by Mr. W. F. Yeames, R.A., now in the Walker Art Gallery in Liverpool, entitled, "True and Loyal (and when did you last see your father?)" A number of Cromwell's Ironsides have invaded the mansion of a Royalist, and are desirous of getting possession of his person, and are examining some members of the family in order to extort information as to his whereabouts. At the moment represented in the picture, a pretty little boy, probably the heir of the house, is being interrogated by some of the civilian members of the band, with a view to entrap him into disclosing how long it was since he had seen his father, hoping thereby to get an idea as to the length of time during which he had an opportunity of escaping. The picture has been well reproduced by Goupil-gravure.





A Mantel in a New York House. Designed by Mr. Louis C. Tiffany.

#### A MANTEL IN A NEW YORK HOUSE.

THIS is from the interior of the New York street mansion illustrated on another page. It is designed by Mr. Louis Tiffany, we presume a member of the family of that name to whom the house belongs. As will be seen, it is, in fact, an application of Indian detail over a European (or American) form of fireplace.

#### BOYLE'S IMPROVED AIR-INLETS.

THE accompanying diagrams illustrate the latest improved air-inlet brackets and wall panels made by Messrs. Robert Boyle & Son, and used in conjunction with their latest-improved patent self-acting air-pump ventilator, which, we are informed, has been awarded the Gold Medal by the jurors on ventilation at the Brussels Exhibition, where it was practically tried on various parts of the Exhibition buildings.

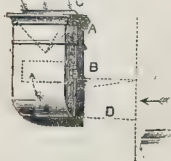


Fig. 1.



Fig. 2.

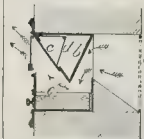


Fig. 4.



Fig. 5.

Fig. 1 shows a plain air-inlet bracket, fitted with air-filter A, regulating valve B, and deflect-

ing shield C, to prevent the wall being soiled by the incoming air.

Fig. 2 shows an air-inlet panel to fit against the wall, having movable front to regulate inlet of the air, and fitted with air-filter as shown in section fig. 3. Fig. 4 is a section of panel having no movable front or projection, fitted with regulating valve C, and water-trough E, to wash, cool, and purify the air. Fig. 5 is a front view of panel. This form of panel is also made without the water-trough.

These appliances are made in a variety of other styles, plain and ornamental.

#### DISCHARGE OF MANUFACTURING REFUSE INTO SEWERS: INTERESTING TO GALVANISERS.

THE *Wolverhampton Chronicle* of the 26th ult. reports at length a case of considerable importance to the manufacturers and public generally, which came before the Sessidary Magistrate (Mr. N. C. A. Neville) at the Wolverhampton Police Court on the 21st ult. It was brought forward at the instance of the Sewerage Committee of the Corporation, before whom in the first instance an analysis of a sample of galvanisers' waste acid, containing galvanising pickle, was submitted, and who, in the second place, were empowered by the Council at the last meeting to take the present proceedings. The summons was issued on the complaint of Richard Evans Willoughby Berrington, Borough Surveyor, who stated that Frederick Evans galvaniser, of Stewart-street, on the 23rd day of November, did unlawfully cause and suffer certain refuse, to wit waste, and known as "pickle," from his manufactory and works, situate at Wolverhampton aforesaid, which was destructive of and injurious to vegetation, and which interfered with the utilisation of the sewage of the borough, to flow and pass into a certain drain communicating with a certain sewer of the Corporation of the borough of Wolverhampton, situate in Stewart-street, in such manner that the same refuse was carried by, through, and out of such drain into such sewer as aforesaid.

The Town Clerk, in opening the case, said that the proceedings were taken out under the Wolverhampton Improvement Act, section 95. Having cited the section, he proceeded to say that it was with considerable regret that the Corporation had found it necessary to take proceedings against any manufacturers in the town. He was sure that they had no desire whatever to interfere with or harass manufacturers or the trade which they carried on, but in consequence of the



enormous difficulties met with in connexion with the disposal of the town sewage, the Corporation felt that the time had now arrived when, if the manufacturers neglected to assist them, they must, in order to protect their interests, enforce the law against them. He had given the defendant three separate notices to abate the nuisance, and every opportunity to execute certain work with a view to destroying the obnoxious qualities of the acids used in his works. He had no desire to ask for a heavy penalty in this case. It was not so much the recovery of a heavy penalty that this case was brought forward, but that an order might be obtained to compel the defendant to abate the nuisance. They did not press for a heavy penalty, but he should like the Stipendiary to fix a day by which something should be done, and if the work was not done, that then the continuing penalty should run.

Robert Franks, a messenger in the employ of the Borough Surveyor, deposed to taking a sample of the liquid which left the defendant's works, and which he took to the Borough Analyst.

Mr. Jones, Public Analyst, said he had analysed the sample mentioned. It was untreated galvanising pickle, except that it was very slightly diluted with water. One third of the whole acid was unused or free. This refuse, which would run into the sewers, would have the effect of destroying the cement or mortar of the joints of the sewers. It was deadly to vegetation, and would render the utilisation of the sewage of the town very difficult and expensive.

Cross-examined: He was strongly of opinion that no limestone had been used in this case. The introduction of lime would kill the free acid, but it would not precipitate the iron. Quicklime would have to be used for this purpose.

This was the case for the prosecution. Mr. Lawrence, for the defence, said that as soon as Mr. Jones received the circular calling upon him to construct duplicate tanks and use limestone, he provided these necessities, and they had since been regularly used. He was willing and anxious to do all he could to meet the Corporation in this matter, and whatever was required to be done should be done forthwith.

The Stipendiary said there would be a fine of 5s. and the costs, and he would fix January 18th as the limit after which the continuing penalty would run. If there were any breach after that date, defendant could be summoned again for every day he allowed the nuisance to continue, and the hearing could take place before him or any other justice.

#### "CHURCH-BUILDING NEWS: EPSOM."

SIR.—There must have been a slip in the report of the local paper (as you evidently suspected) from which the particulars given in your last issue under this heading were taken.

The cavities in the walls were not caused by the decay of "two timbers," but of two bond timbers behind the dado framing.

The timbers were 9 in. by 3 in. and 4 in. by 3 in. respectively, and were built into the walls all round the church.

The larger timber occupied just half the thickness of the aisle walls, and when exposed little more of it remained than dust.

H. M. & W. GRELLIER.

#### ELECTRIC LIGHTING NEWS.

London.—It is announced that the Board of Trade, by virtue of the powers vested in it by the Electric Lighting Act of 1882, has decided to refuse the whole of the applications that have been made to it to grant licences for the supply of the electric light to any part of the metropolis. The effect of this decision is that all applications for supplying the electric light to any part of the metropolis will have to be sought by means of Provisional Orders, which, if granted by the Board of Trade, will have to receive the sanction of Parliament before they can become operative. All Provisional Orders that may be granted will, therefore, be embodied in a Confirmation Bill and referred to a Select Committee, before whom opponents will be heard.

Birmingham.—The Birmingham Gazette of Wednesday last says that the sub-committee (of the Town Council) which was appointed by the General Purposes Committee to consider the proposed Provisional Order for lighting a considerable area in the centre of Birmingham with electricity, will, it is expected, report in time for the matter to be discussed at the next, or, failing that, at the February meeting of the Council. The provisional order has been applied for by Messrs. Chamberlain & Hookham, and the area in respect of which compulsory powers are sought, consists of about 203 of a square mile, or about 130 acres. On the whole, the Gazette believes the report will be not unfavourable

to the scheme, but a number of conditions in the interests of the ratepayers and of public safety will be imposed. The most important of these conditions will have reference to the question of overhead *versus* underground electric-lighting wires. There is a general consensus of opinion that overhead wires, whether for electric lighting, telephoning, or telegraphic purposes are more or less objectionable. They are unsightly, and they are a source of danger. In the case of overhead electric-lighting wires there is a considerable difference of opinion as to the character and urgency of the objections alleged against them, but even those who are most inclined to take a lenient view with regard to them admit that underground wires are much better, and must be eventually adopted. The question, therefore, is really,—shall overhead wires be permitted for pioneer or experimental purposes, or must all electric-lighting undertakers be forced at the outset to take the roads up and lay their wires underground? The matter is of the highest importance, because, on the one hand, the public may be placed in jeopardy; while, on the other, there is the danger of greatly handicapping electrical enterprise, if not of stopping it altogether.

The Cape steamer "Roslin Castle" has lately been fitted with a complete installation of the electric light. Every cabin (first, second, and third class) has a lamp which can be turned off at will by the passenger, who has simply to touch a switch at the side of his berth. The saloons and other reception-rooms are brilliantly lighted, the cut crystal globes in the principal saloon and the dainty lamps in the ladies' boudoir being worthy of especial mention. Very powerful electric signal lights have been fitted.

A New Electric Safety Lamp.—A miner's safety lamp, made by the Mining and General Electric Lamp Company, of Coleman-street, E.C., has been in use for over nine months in a number of North of England collieries. The Times says that the incandescent lamp employed gives a light of one standard candle during twelve hours. The current is derived from a small lithanode accumulator of two cells, giving an electromotive force of four volts. Lithanode, a form of plate for accumulators, introduced by Mr. D. Fitzgerald, is a hard conductive peroxide of lead. A lithanode accumulator, the latest form, weighing 70 lbs., has a capacity of one horse-power-hour, whereas an "E.F.S." accumulator of the same capacity weighs from 133 lb. to 185 lb., according to the type. The two cells of the lithanode accumulator weigh about 5 lb., but it is hoped that this weight will be still further reduced. They are charged by a dynamo for five hours before using. The battery case is made of birch wood, rendered acid and water-proof by a special process. The cover of the incandescent lamp is of toughened glass, which, on being broken, shivers into small pieces, thereby allowing a lever inside the cover to drop down and cut off the current instantly. This device is adopted in order to prevent the exposed filament causing an explosion in contact with fire-damp in the atmosphere of the mine. The cover can be locked with a lead plug, which, in the event of the miner being entombed or forcibly detained in the mine, can be picked out, so that the cover may be removed and the current cut off to husband the light. Under ordinary circumstances, however, the miner does not interfere with the apparatus. There is no switch to turn the light on or off at will; the action of putting on the cover lights the lamp, and the miner cannot put it out except by breaking the sealed plug. The lantern can be turned upside down without affecting the light or battery, and it may be held at any angle. The cost of the light is stated to be about 2½d. per lamp per week.

The Gritten Memorial Fund.—We are asked to mention that owing to the shortness of the notice, and the fewness of the members, Mr. Uaill has kindly consented to postpone his lectures on "Iron Construction" (in behalf of the Gritten Fund) until Tuesday, Jan. 8, and Thursday, Jan. 10, at 5:30 p.m., at 11, Delahay-street, instead of on the dates as advertised in our last issue. The fee for the course is half a guinea. (See advertisement in last week's Builder.)

The Lyric Theatre.—Anent our recent description of the new Lyric Theatre, we are asked to mention that Messrs. Smith & Turner's "Ben Turner's" new patent "Silent" door-springs were used in the building.

## The Student's Column.

### TOWN DRAINAGE.—I.

IN town drainage we include house drainage with the public sewerage. The sewage delivered by the house-drains into sewers finds its way by gravitation to its outfall, and usually there is one outfall for a whole town. Sewage, in the following articles, will mean that heterogeneous liquid which consists of the waste water of houses and all the refuse of the rainfall which runs into sewers from the surfaces of streets and the roofs and premises of houses. Since towns have extended so far beyond the old limits, difficulties with the drainage have arisen, both with the town as a whole and with the separate houses; for, whereas formerly the sewer was short, it is now in many cases of great length, and that alters the state of things in relation to both the sewer itself and the house-drains connected with it.

It is one of the things which contribute to the foul air of sewers. A great deal is heard of this foul air, and, moreover, a great deal has been suffered from it. But sewers are not all alike in this respect: they may not be so even in the same system of sewers which forms the sewerage of a town, or of a district of a town. It may be that they have not been designed and constructed at one time, but at different times as occasion has required, and this of itself would have an effect upon the general house drainage, inasmuch as the sewers are connected one with another throughout a town, or a district, if the town be a large one; good ones with bad, and so on. For such defects sanitary authorities are responsible, but architects are responsible for the drainage of houses designed and built under their own directions. And inasmuch as it is the house which is the place of origin of the sewage to be conveyed away, we will consider house drainage first in order. Efficient drainage is now a necessity in all buildings intended for habitation, and it cannot be wholly neglected even in those in which people congregate for a limited time only, for in these some part must be appropriated to the attendants, and it cannot be overlooked that if the air in servants' quarters in any house or other building be contaminated, it will spread its noxious influence through the whole building, whatever its dimensions be.

Not many architects, neither many engineers, can give their attention solely to the greater aspects of what they have to do, and certainly no young man can afford to neglect the consideration of these small things belonging to his profession: small, indeed, but very important. He may think, as too many have done, that somebody else will attend to these things; the builder, perhaps; or that the owner of the building will probably appoint someone to do so; or that the sanitary authority will be sure to see that the drainage is properly done. Delusions, all. It is the architect himself who must be the master in this as in everything else belonging to the building. Would he neglect to consider the proper strength of every part? Not so, unless, in the case of an extraordinarily large building, an engineer may be associated with him in the design. In all other cases the architect must be the master of the drainage; and, moreover, must do something more than lay down upon the plan all proper lines of drains, and show by sections all proper depths; he must specify exactly what he wants done, and in doing so must let those who do the work see that he knows what he does want. This is, perhaps, more necessary when the work is let by contract than when done in another way. Contractors have done a great deal of bad work, but they have sometimes had the excuse,—though they may have known better than to plead it,—that it was difficult to understand what was really required by the architect or the engineer, and they have taken upon themselves the responsibility of doing the work in their own way, in the expectation that, if not satisfactory, it could in no way be said to be contrary to the specification. As to the vague clause sometimes inserted in specifications to the effect that everything is to be done to the satisfaction of the architect, or the engineer, as the case may be, it does not stand good when disputed. It is a provision which is perhaps necessary to be inserted in a specification, but it cannot be relied upon to cover omissions of detailed in-



structions. Students of architecture will find, more perhaps now and in the future than has hitherto been usual, that buildings of nearly all kinds are never complete without efficient drainage.

There is nothing very intricate or perplexing in the principles of drainage; they lie ready to one's apprehension in the things around us, and require chiefly a due consideration of their modes of action and effects. But, although the principles are not far to seek, their application in practice is not regarded, in many cases, with the attention which the importance of the subject demands. Certainly a little patience is necessary, for it is not an inviting subject or one of the most pleasant to study; and some consideration is necessary to distinguish between those instances of practice in which the principles of drainage are recognised and acted upon, and those which are founded—if upon anything—upon precedents which can no longer be followed. When alterations are made in old houses, or when drains require examination and the ground is opened out over them, it is seen how drains used to be laid and how their attachments were formed, and these are often found to be inefficient for their purpose, and the cause of many complaints. It is not in point of size that old drains are insufficient, for a pipe 9 in. in diameter is sometimes found where one of 6 in. is sufficient, and even more than sufficient; nor is the depth at which these old drains are laid inadequate in all cases. It is chiefly in their form and the mode in which they have been laid that their defects are apparent, including the manner and situation of their terminations. It would hardly be an exaggeration to say that some of these have been altered and relaid in parts half-a-dozen times without any good effect. The money so spent in providing employment for workmen and others may have been acceptable, but it must have been unwillingly given, and, therefore, the occasion cannot have been satisfactory to either party. In such cases a little boldness in recommending a complete reconstruction would have been better. Tinkering, as it may well be called, in such cases seldom succeeds; the defects are mostly of a radical nature, and the better economy is to begin at the lowest end of the drain and work upwards. The sewage, which is being continually formed, should be made to run as quickly as possible away from houses. If any one will take the trouble to investigate the causes of bad health in towns, as stated by the medical officers in their periodical reports, he will find in defective drainage one of the chief amongst them. Sanitary authorities are of course blamed for these defects, as well as for all others by which the health of persons is injured; but whatever action they may take is in a great measure ineffective if those who actually do the work of house drainage do not exercise their judgment in details. But as to details, it may be said that perfection must not be sought in minute or complicated arrangements, but in a broad simplicity of detail consistent with those principles of action which cannot be evaded without bad results. The best sewerage system which could be devised would fail in its main purpose if the drains belonging to the houses were not well laid. When persons in a particular house have suffered more than others, the question has not infrequently been asked—Who was the architect? The question is often futile, because many houses have been built without the aid of any architect. Students, however, may expect for themselves a different state of things in the future. The medical profession is much more alive now than it was formerly to the influence of that condition—or of those several conditions—of the air which exist in consequence of defective drainage. But it is not in the medical profession only that more attention is being given to the subject, for, as common knowledge of the conditions of the air in and around houses increases, so much more is the public attention directed to this subject. The information thus acquired by people in general would probably result in wrong remedies being attempted if that information were acted upon and remedies sought thereby, and this should be avoided by preventing the creation of those conditions of the air which, everybody knows, produce sickness. Whether that leads to more serious bad health we may leave for others to determine.

**The Walker Art Gallery, Liverpool.**—The Autumn Exhibition of pictures here was attended by 71,600 visitors.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

546, Window-fastener. C. C. Wright.

In a metal bolt, half-screw and half-plain, with a shoulder at the plain end, a square hole is, according to this invention, bored down the centre from the plain end. A loose piston-rod is placed therein, and at the outer end of the rod-nut is fixed. A hole is bored through the bottom sash, and the screw-bolt is so placed that the nut and plate appear on the front or inside of the sash. A screw-receiver is fixed on a corresponding part of the top sash. The sash is fastened by screwing in the nut and bolt, and is unfastened by turning in the opposite direction.

888, Draught-preventer. H. Waddington.

This invention consists in having two pieces of wood of suitable size and shape. The top piece, which is secured to the door or window, is rebated on the side next to the door to receive a bottom-piece, with projects below it. Pulleys are fixed to make the one piece run easily over the other, and springs allow of the piece sliding up when the door is opened, forcing the lower piece downward when it is closed.

1,046, Fire-grates. W. B. Redish.

The object of this invention is to conduct the combustion of the fuel without waste, and to utilise the heat given off. The fire-bars are combined with a movable bottom grate, which also serves as an ash-pan and a back, and in kitchen-ranges, rocking fire-bars and levers for actuating the same are used.

1,199, Ventilator. A. Brown.

According to this invention, an internal circular shaft of perforated zinc is enclosed in an outer shaft of larger diameter. On the outer shaft O G louvers are fixed, and the whole surmounted by a cap or roof. The vitiated air escapes through an ornamental pierced opening fixed at the bottom end of the shaft and level with the ceiling, and ascends, by reason of its higher specific gravity, to the upper portion of the shaft and out by the louvers. After being cooled and purified by the cold air coming in by the lower louvers, it re-enters the room by the same opening. Thus a constant stream or circulation of air is kept up.

1,258, Valves for Water-closets. J. Anderson.

A valve, self-acting both in opening and closing, is designed by the inventor for use in closets, &c. It acts by means of a tubular valve-rod working in a float-chamber. When the closet is at rest the discharge-pipe is closed by the valve, and a sufficient supply of water is retained in the basin, the float being at its lowest position in the float-chamber. On admitting a supply of water to flush the basin, a portion sufficient for the purpose is discharged into the float-chamber, causing the float to rise quickly to the top, lifting the valve and opening the discharge-pipe. The water rising in the central tubular compartment of the float passes into the hollow valve-rod and quickly syphons the water out of the chamber, causing the float to fall and the valve to close the discharge-pipe.

14,687, Window-sashes. J. Kirkbride.

By this invention sash-cords are dispensed with, a coiled spring being used to accelerate the movement of the sashes, and the window may be fixed at any height by the insertion of a peg in one of the series of holes made in the sash, and fastening in the serrations of a rack fixed to the other sash.

14,968, Vertical Sliding Sashes. W. Stead.

This invention relates to improvements in the construction and hanging of vertical sliding sashes for windows, &c., whereby such sashes may be turned on an axis downwards into the room, for the cleaning, painting, glazing, ventilating, &c., without displacing the sash-cords, and to enable each sash to be readily withdrawn from the frame when required.

15,489, Public Sanitary Appliances. G. Jennings.

This invention relates to improvements in the construction of a shield or back of stoneware or other suitable material, designed principally to obviate the soiling of the seats, and to reduce the soiling area. Curved wings are used, and roses, specially placed, distribute the water and remove all soil.

7,987, Observation Compartments, &c. G. C. Farr.

By this invention passages or trunks from each room are led to those from whence the observations are to be made—the manager's room, for instance—and mirrors, hung or placed at suitable angles and positions, are used.

**Antiquities at Cairo.**—The Boshak Museum at Cairo, so familiar to tourists in Egypt, will soon be a thing of the past, as the valuable collection of antiquities contained in the present buildings will be moved to Ghizeh Palace on the left bank of the Nile, a few hundred yards above Kasr el Nil Bridge. Mr. Grebant, the Director-General of the Department of Antiquities, received instructions a few days ago to commence the removal, which will take some time, as the work will have to be done very carefully.—*Morning Post*.

## MEETINGS.

**SATURDAY, JANUARY 5.**  
*Association of Public Sanitary Inspectors.*—Mr. R. Tidman on "The Drainage By-Laws as Administered under the Metropolitan Local Management Acts."

**MONDAY, JANUARY 7.**  
*London Institution.*—Mr. Harry Furniss on "Art and Antiquities." 8 p.m.  
*Victoria Institute.*—Rev. F. A. Walker on "Colours in Nature." 8 p.m.  
*Estates Exchange.*—Meeting of the Committee. 3 p.m. (Action Mart).

*Clerks of Works' Association (Carpenters' Hall).*—Monthly Meeting. 8 p.m.  
*Leeds and Yorkshire Architectural Society.*—Mr. J. Starkie Gardner on "Art Metal-Work." 7.30 p.m.

**TUESDAY, JANUARY 8.**  
*Institution of Civil Engineers.*—Mr. E. Worthington, B.Sc., on "The Compound Principle applied to Locomotives." 8 p.m.  
*Society of Biblical Archaeology.*—Anniversary Meeting. 8 p.m.

*Glasgow Architectural Association.*—Mr. W. M'G. Petrie on "Greek Ornament." 8 p.m.  
*Manchester Architectural Association.*—7.30 p.m.

**WEDNESDAY, JANUARY 9.**  
*Civil and Mechanical Engineers' Society.*—Mr. A. F. Bruce on "The Cost of Executing some Classes of Engineering Work." 7 p.m.  
*Birmingham Architectural Association.*—Presidential Address by Mr. T. Hudson. 8 p.m.

**THURSDAY, JANUARY 10.**  
*St. Paul's Ecclesiastical Society.*—Mr. W. Bolton on "The Marshland Churches of Norfolk, Lincolnshire, and Yorkshire." 8 p.m.  
*Institution of Electrical Engineers.*—Inaugural address by the President (Sir William Thomson). 8 p.m.  
*Society of Antiquaries.*—8.30 p.m.  
*Edinburgh Architectural Association.*—Mr. J. MacLaren on "The Ancient Ecclesiastical Remains in Scotland." 8 p.m.

**FRIDAY, JANUARY 11.**  
*Institution of Civil Engineers (Students' Meeting).*—Mr. G. A. Becks on "Refrigeration, and the Artificial Production of Cold." 7.30 p.m.

## Miscellaneous.

**The Subsidences in Cheshire.**—The committee appointed at the meeting of the property owners at Northwich to draw up a memorial to Mr. Ritchie, appealing to the Government to grant a Royal Commission to enquire into the enormous damage done to property in the salt district by subsidences, have reported that 1,000,000 tons of salt are annually extracted and exported from Cheshire. The brine is pumped up, and contains about 25 per cent. of salt. As the brine is pumped up the earth subsidises, and the damage done is of the most serious nature to house property, roads, highways, gas-pipes, lamps, and buildings. Many acres of land have subsided to such an extent as to be permanently covered with water. Owners are now suffering to a very much greater extent than at any previous time. The grievance is all the greater because the rock salt which forms the foundations of the houses is the sole and exclusive property of the owners, and they are heavily taxed each year, in addition to their private losses, to make good the injury done to the streets. The subsidences are also very serious at Winsford. It is stated that at the latter place over 100 acres of land have sunk, and are now covered with water to a depth of 20 ft. In the town and neighbourhood of Winsford damage has been done, public and private, to the extent of, it is computed, £150,000. The market has sunk down 30 ft., and the market-hall had to be rebuilt seven years ago, while Winsford-bridge, the principal structure over the Weaver, has been twice raised. Some of the house property has been rebuilt three times, and in one part of the town a house has gone down so far that only the top part of the roof is now visible above ground. At Northwich, the Dane-bridge, the principal means of access to the town, has been rebuilt three times during the past eleven years at enormous cost. The level of High-street, Northwich, has been raised 3 ft. during the past year, and it is steadily and surely going down to its former level. The suggestion is that the salt trade should now be taxed to make good the losses it inflicts on the residents of the district.

**Emigrants' Information Office.**—This quarter's circulars, relating to Canada, the Australasian and South African Colonies, have just been issued; and a poster, giving a summary, is exhibited in every post-office. Mechanics are only in demand in very few localities, as in the western districts of Canada (in the Spring), in Melbourne, especially for those connected with the building trades, and, to a limited extent, in Tasmania. The circulars may be obtained, free of cost, from the office, 31, Broadway, Westminster, S.W.; and ten separate handbooks, one for each colony, and each containing a map, at 1d. each, post-free, or bound together, at 1s. 6d.



**The Timber Trade at Bristol.**—During the year 1888, the importation of foreign timber, deals, &c., into the port of Bristol amounted to about 70,000 tons register, or about one-eighth of the total foreign tonnage of the port. Compared with previous returns, the import was below 1883, 1884, and 1885, but higher than in 1886 and 1887. The tonnages were, 1883, 84,055; 1884, 85,668; 1885, 78,942; 1886, 62,660; 1887, 69,943; and in 1888, 70,000. To the trade the year proved one of surprises. January opened with an unprecedented demand by importers for wood goods. Prices at the various ports of shipment were accepted at the same level as the previous year, and the boom soon caused advances in values, and the upward tendency continued through the year. In addition to the rise in f.o.b. values, freights went up by bounds, and finally resulted in an increase over the rates current in 1887 of about 50 per cent. and even as much as 80 per cent. was paid. During the month of December, 1888, greater activity in purchasing had been manifested by timber importers in this country, and also on the continent and in the colonies, than had been known by any living seller, and operations in this direction have advanced for 1889 further than usual by the end of February. The present values all round at ports of shipment abroad are about 20 per cent. higher than at this time last year, and the demand continues strong. Consumers must prepare to adapt themselves for much higher prices for goods purchased in 1889. Bristol has felt the competition of South Wales ports, and the great coaling ports of the Channel enjoy advantages of being able to obtain lower freights than vessels chartered to Bristol, where difficulties present themselves in finding outward cargoes. At Bristol, also, the timber trade suffers from lack of facilities of moving timber. The increased freight, owing to the absence of outward cargoes, has been put at 1s. 6d. per ton, and the additional cost of transit due to want of convenience at 1s. 3d. per ton, making 2s. 9d. per ton, or 6s. 10½d. per standard against Bristol, a circumstance tending much against the development of Bristol as a port of distribution.

**Two Useful Reference Books.**—"The Insurance Year-Book, 1889" (London: Simpkin, Marshall, & Co.), is a useful and reliable guide for persons effecting insurances, and contains much useful information for business men.—"Sell's Dictionary of the World's Press, and Advertisers' Reference Book for 1889" (London: Henry Sell, 167, Fleet-street) makes its appearance promptly on the first day of the New Year. The first issue of this book was in 1881, when it numbered 400 pages, and now, in the ninth issue, we find it increased to 1,400 pages, and the pages much larger than formerly. This increased space is well filled with all sorts of tabulated matter relating to the charges for advertising in all London and provincial papers. The contents are not only plentiful and varied, but they are so arranged and indexed that any item sought can be found at once. In addition to the business part of the book, there are about 300 pages given up to a variety of articles, all of which relate directly to "press" matters. This "Directory" will be useful in every office.

**New English Church, Boulogne-sur-Mer.**—On Christmas Day our countrymen resident in Boulogne opened a new English church, dedicated to St. John, in the Rue des Vieillards. The architect of the church is Mr. W. Thorold Lowdell, of Great James-street, Bedford-row, London. The heating, on the small ½-in. bore pipe high pressure system, the ventilation, and lighting, as well as the metal work to altar-light and pendants, were executed by Messrs. John Smeaton, Son, & Co., of Great Queen-street, London. The builders were the well-known contractors of Boulogne, Messrs. Lacour Frères. We are asked to mention that subscriptions towards the Building Fund will be thankfully received by the English Chaplain, the Rev. J. H. Fry, 44, Boulevard du Prince Albert, Boulogne.

**New Institute at Winhill, Burton-on-Trent.**—This institute, which has been built by public subscription, has been lately opened. The buildings occupy a site in Mount-street, and have been erected by Messrs. Lowe & Sons, from designs of Messrs. Osborn & Reading, architects, Birmingham, at a cost of about 1,500. They consist of an entrance hall, a large lecture hall, ante-room, and cloak rooms, reading room, class rooms, caretaker's residence, &c. The materials used are red bricks and stone dressings.

**New Cottage Hospital, Saltash.**—The new Cottage Hospital and Convalescent Home of St. Barnabas, built at the cost of Mrs. Ley, of Claremont, Saltash, was recently opened. The building occupies an elevated site in Upper Port View-road, commanding extensive views of the Hamoaze and neighbourhood. It is built of red brick, tile-hung, with half-timbered oak-work, and prominent architectural features are the numerous gables which surround it, and the colonnaded verandahs which project out from the upper storey on the south side. A conspicuous feature is the circular end of the chapel on the east side. On the left of the entrance lobby, which is on the north side within a few paces of the road, is a waiting-room for visitors. Double swing doors open into the hall, where there is a recess in which an ambulance will be kept. On the right, in close proximity, is the operation-room. Adjoining this apartment is the surgery, and in a line with it a bath-room. The men's wards are two in number, and occupying nearly the whole of the south side of the ground-floor. Each ward will accommodate four beds. Between them is the sisters' room, which commands a view of each through small windows. Access is obtainable from the sisters' room to a verandah running along the front of the premises. Up a short flight of stairs on the north side is a spare room, and adjoining it a bedroom for the sisters. Further up still, on a level with the principal landing, is a dining-room with open-timbered roof, for convalescent patients, with a balcony outside facing south. Immediately adjacent is the nurses' day room. On the same landing are the two wards for female patients. The larger of the two is of similar dimensions to the men's ward below, and occupies the south-west corner. The other, which will be provided with only two beds, faces west, and between them is the nurses' bedroom, which has a balcony outside. On the north side, up another short flight of stairs, is the children's ward, with accommodation for four beds. The whole of the east end of the building is occupied by a little chapel, apsidal in form, and with its interior of red Berkshire brick, relieved by stone dressings and labels, the arches over the windows being of rubbed gauged brickwork. The roof is barrel vaulted. Seating accommodation will be provided for twenty-four persons. Near the organ-recess has been hung the dedication picture, depicting St. Barnabas, painted by Mr. E. Fellowes Prynne. Each ward has its own lavatory and other conveniences, and there are no drains running under the building, all the pipes being carried away on the outside and ventilated. The whole building is heated by hot-water pipes, supplied by Bennett Bros., Liverpool, and the wards are fitted with bells. There is also a lift communicating with the upper landing. The work has been substantially carried out by Mr. R. W. Rowe, builder, of Muteley, from the designs of Mr. George Fellowes Prynne, architect, London and Plymouth.

**The "Castle Line" Cape Steamer "Boolin Castle."**—The other day a number of gentlemen interested in the Cape and shipping-trade inspected the alterations lately made on board this steamer. The decorations have been carried out under the superintendence of Mr. G. Duncan, of Eppingham-street, London. The prevailing tone of the colouring in the principal saloon, is a soft bluish grey, intermixed with vellum tints and relieved with gold, all of which harmonises with the rich satin wood panelling. Portraits of distinguished men, including Milton, Hogarth, Wren, and Beethoven, painted by what is described as "an everlasting process" of raw sycamore wood, have been introduced round the lining of the skylight. The ladies' boudoir is upholstered with green brocatelle, and is panelled with cedar and sycamore. The new ceiling in the principal smoking-room, with its octagonal panels, is rich in colour. All the state-rooms have been re-decorated.

**Rotherham Union Workhouse.**—The Board of guardians of this union decided at a recent meeting, to make certain important alterations and additions to the buildings, and it was resolved that Mr. H. L. Tacon, architect, Rotherham, be instructed to prepare plans for the erection of a certain number of infectious or foul wards, also for remodelling and enlarging the whole of the present workhouse buildings, and for carrying out other work that may be considered urgently needed in accordance with the suggestions made by the Local Government Boards inspector.

**The Reredos, Gloucester Cathedral.**—The Gloucestershire Chronicle says:—"We are glad to state that the proposal by the Freemasons to carry out the decoration of the reredos in Gloucester Cathedral, in accordance with the experimental design of Messrs. Clayton & Bell, has been assented to by the Provincial Grand Lodge. The reredos was erected fifteen years ago by the Freemasons of the province, at a cost of 1,300l., from designs by the late Sir Gilbert Scott, the statuary having been carved by the late Mr. Redfern. The Cathedral authorities being desirous of decorating the backs of the niches, in order to throw the figures more into relief, and also of gilding part of the tabernacle work, a communication on the subject was laid before the meeting of the Provincial Grand Lodge at Stow-on-the-Wold in May last, and a committee was appointed to ascertain the views of the brethren of the province, and to take such action in the matter as might seem to them desirable. The committee authorised as an experiment the decorating of the backs of two of the niches, and the application of gold to the centre of the structure. This was done under the direction of Mr. Clayton, and though the proposal has led to much newspaper correspondence, the work has been greatly admired, and has received the hearty approval of most of those who attend the cathedral services. We know of two eminent artists,—one of them in the first rank of the profession,—who have inspected the work, and have given it their warmest approval." The Provincial Grand Lodge was not unanimous, however, in giving its approval, an amendment being moved on the ground that "the proposed colouring was foreign to the original design of the reredos, and that no idea of such a decoration was entertained until a few months ago." The amendment was lost by a large majority.

**The Powers of Water Companies.**—The Clerkenwell Vestry having considered the power of water companies to cut off water from houses which are under the constant supply system if the fittings are in such a state as to occasion waste of water, deemed it advisable, in the interests of public health, that the companies should be deprived of this power. After communicating with the other local authorities of the metropolis, the Vestry requested Captain Penton, M.P., to introduce a Bill into Parliament empowering the companies or the local authorities to carry out the necessary works in cases of waste, and to recover the costs from the owners. The member for Central Finsbury has consented to bring forward a Bill with this object next session. The New River Company has written to the Vestry suggesting that the latter should move the Local Government Board to initiate a constant supply in the remaining portions of the parish.—Daily News.

**New Theatre at Everton.**—A new theatre at Everton, Liverpool, was opened on Christmas Eve. It is described in the Liverpool Daily Post as "a very cosy and ornate specimen of theatrical architecture, being replete with all the latest improvements, and offering attractions exceeding in samptuousness those of much more pretentious buildings." The edifice has a good position at the corner of Breck-road and Breckfield-road South. It is capable of holding upwards of 1,000 persons, and does not contain a single staircase. The pit, which is on a level with the street, is entered from Breck-road, and has an exit into Breckfield-road. The upper floor, which is entirely devoted to the private boxes, dress-circle, balcony, and promenade, is approached from Breckfield-road South. The building has been designed and erected by Mr. W. Redman, of Liverpool, for Mr. Thomas Montgomery, the proprietor.

**Newcastle Water Supply.**—A meeting of the Newcastle Gas and Water Committee was held on the 28th ult., under the presidency of Alderman Youll. The committee considered the proposed Bill promoted by the Water Company. It was decided to insist that, prior to the Water Company supplying adjacent towns, the minimum of supply reserved to the city, instead of being 200 million gallons, should be 400 million gallons.

**Church Clock, Bawtensall, Lancashire.**—The parish church here has just been furnished with a large clock. It has four dials, each 7 ft. 6 in. across, plays the Westminster quarters, and strikes the hours upon a large bell. The pendulum and escapement are important features, the pendulum bob being about 3 cwt., and the escapement a double three-legged gravity one. Messrs. John Smith & Sons, Derby, carried out the work.



**A Danger Peculiar to Residence in Flats.**—A case was heard last week before Mr. Justice Hawkins which is instructive from several points of view. The defendant took a flat on a term of seven years, and subsequently, finding that the premises were unwholesome, the basement becoming flooded from the sewers, refused to pay his rent. From the legal point of view, it appears that the defendant placed himself in the wrong by not having a definite understanding that the plaintiff guaranteed the premises as healthy, and also in paying his rent between December, 1886, when he first found reason to complain of the premises, and Michaelmas, 1887, when he left them on account of the alleged stench from the refuse water and because of illness in his family. Speaking generally, we believe a tenant may repudiate his contract if his landlord has made a stipulation which he has not kept, or if the bargain has been entered into by reason of a false statement. But if he allows the matter in complaint to go on without taking action, his opportunity is lost, and in this way the defendant in the case in question failed to secure a judgment. But there is another point of even greater interest in the case, and this quite apart from the condition of the actual premises in dispute. It has to do with a risk involved in residence in flats. An ordinary householder has access to every portion of the building in which he lives, and should he suspect a defect, he can ascertain how far his suspicion is correct, and remedy it. But in the case of flats, whilst the actual apartments rented may be free from all risk of evil, the tenant is, in point of health, almost entirely at the mercy of his landlord and of the occupiers of the basement in so far as the main drainage of the premises is concerned. If this latter be wrong, the whole mansion is apt to be filled with foul air from below upwards. A number of cases have come under our notice in which very serious ill-health has been thus induced, and in which tenants have only been too glad to pay what was demanded of them in order to get out of the premises with the least possible delay. Whilst no one should take a residence without skilled advice as to its sanitary state, this precaution is more than ever necessary in the case of flats, where the entire premises, including, above all things, the basement, should be thoroughly overhauled. And if the main drain is not both water-tight and so disconnected from the sewer as to admit of a free current of fresh air through its entire length, we have no hesitation in asserting that the risk of living on the premises is a substantial one, and that it is increased by reason of the multiple occupation which always occurs in the case of flats.—*Lancet*.

**The Royal Barracks, Dublin.**—In his recent answer in the House of Commons on the sanitary condition of these barracks, Mr. Stanhope is reported to have stated that most of the recommendations of Sir C. Cameron's Commission were carried out, and that nearly all were in course of adoption. He added that a further wholly independent inquiry would be undertaken by Mr. Rogers Field. We have recently pointed out that the most important of the recommendations referred to have not been carried out, and we may now add that the Department of which Mr. Stanhope is the chief has absolutely declined to carry them out, notwithstanding the strong protest of the Dublin Department. Two Commissions have already considered the condition of the Royal Barracks, and their recommendations are in the same direction. Now a "further wholly independent inquiry" is determined on. If Mr. Stanhope wants his department—or the Royal Barracks—"white-washed," he could not have made a worse selection than Mr. Rogers Field, whose little finger will, we imagine, be much heavier than the loins of the previous Commissioners. Meanwhile, we recommend for general adoption in the army the policy of the colonel of one of Her Majesty's regiments, who positively refused to transfer his regiment—and himself—from the Curragh to the Royal Barracks, on the ground of their insanitary condition.—*Sanitary Record*.

**Change of Name.**—The Society of Telegraph Engineers and Electricians (founded in 1871, and incorporated in 1883), has now become the Institution of Electrical Engineers. The opening meeting of the session will be held on Thursday next, the 10th inst., when the president, Sir William Thomson, will deliver his inaugural address.

**Matheson & Grant's Engineering Trades' Report.**—From this report for Jan. 1, 1889, we make the following extracts:—"There has been increased activity during the last six months; the leading makers of bridges and roofs have not yet risen much beyond what is due to the higher cost of material and fuel. Although the increased output is largely due to export, the demand at home has also been better—bridge renewals and structural work for theatres, hotels, and market-buildings, being among the leading classes of work now called for. The Forth Bridge will probably be finished this year, while, as another modern wonder of construction, the Eiffel Tower in Paris, 1,000 ft. high—now approaching completion—is a daring achievement, which will be the principal feature of the coming Exhibition. In the United States, bridge-builders are very busy; many bridges of large span are being constructed; and besides the work for new railways, the renewals of bridges too weak for modern traffic are adding to the demand. In Canada also the replacement of weak wooden bridges by iron or steel must soon be attended to, the want of money, rather than any doubt as to the necessity, having hitherto retarded the change. . . . The consumption of Portland cement during the past year has been very great, and although export has lately been restricted by the rise in ocean freights, there is every prospect of an increased demand and higher prices. South America continues to take large quantities of cement for the important public works now in progress; the shipments to the United States have also been in excess of previous years, and seem likely to continue. Public works at home are at present neither numerous nor extensive, and no undertakings of importance have been lately authorised by Parliament. The Manchester Ship Canal is being pushed forward with exceptional vigour, and other improvements of water communication by the canalisation of rivers are receiving much attention from capitalists and engineers. Foreign public works and other forms of industrial enterprise abroad are at present the main sources of profitable employment to the engineering trades of this country. Although in India and the Colonies there are no single undertakings of magnitude going on, the aggregate mileage of railways in progress, or in view, is considerable. In China the railways which are being completed in the north and in Formosa will probably be followed by extensions. In South America important works are being carried out in the cities of Rio and Buenos Ayres; in the Argentine Provinces the resources of the country are engaged to their fullest capacity on railways, for which material is almost all imported from this country; in Chili, new railways to the value of three millions sterling have been authorised, and although this work has been let to American contractors, most of the plant and material will probably be ordered in this country, as, under the tariff system in the United States, the cost is much higher there than here. The stoppage of the Panama Canal works is the greatest engineering failure that has occurred this century. Apart altogether from intrinsic elements of failure, the undertaking has suffered from incompetent management. The methods of raising money, the secret commissions to financial newspapers and brokers, the payment of interest out of new capital, a wasteful purchase of unsuitable plant, and an insufficient and unskillful use of the plant when purchased, have together proved fatal."

**The Kingston Jubilee Fountain.**—The Kingston Jubilee Memorial Fountain, which stands in a prominent position in the Fairfield-road, and which was erected by public subscription to commemorate the fiftieth year of the reign of Queen Victoria, has just been handed over to the town by the chairman of the subscribers, the Mayor being the recipient on behalf of the inhabitants. It is a lofty structure, containing two stages above the basement and pedestals, having turrets at the angle of each stage, and surmounted by a cupola. It is the work of Messrs. Doulton & Co., the material being glazed Doulton ware.

**Wood Block Flooring in Churches.**—Mr. Roger L. Lowe, of Farnworth, writes to say that the floors of Christ Church, Coseley, have been laid with his patent redwood block flooring, and the floor of Melbury Osmond Church with his patent pitchpine wood block flooring. Both churches were referred to in our last issue.

**Trade Books, &c.**—From Messrs. Charles Churchill & Co., of 21, Cross-street, Finsbury, we have received their new illustrated catalogue of American machinery and tools. It is well illustrated, and very comprehensive in character, extending over 150 quarto pages. Wood-working machinery and tools occupy considerable space. Stanley's and Bailey's patent adjustable bench-planes include some novelties. Both patentees have what they term "filletsters." We presume that this is our carpenters' word "filister." Mechanical engineers' tools are very fully represented in this useful catalogue.

—Messrs. Ashton & Green (Limited), of Bury-street, St. Mary-axe, have sent us one of their illustrated price-lists for 1889. It forms quite a bulky catalogue of 250 pages, and contains between its covers particulars of every possible kind of builders' requisites, such as stoves and grates of all kinds, chimneypieces, over-mantels, kitchen-ranges, fenders, tile-hearths and jambs, baths, lavatory-fittings, door-furniture, iron balusters, gas-fittings, gutters and pipes, pumps, stable-fittings, water-closets, ventilators, and the thousand-and-one other things required by builders. It is a very handy price-list for office use, but we are sorry to see that it includes that insanitary abomination, the pan-closet. When will this filthy-retaining appliance become quite obsolete? It is retained in price-lists and catalogues simply because it is still in demand. Not long ago we heard that one firm alone sold on an average a dozen pan-closets a week, or 600 per annum! Who are the builders who fix these dangerous appliances? Does the Parkes Museum contain any model or drawing clearly showing to inquiring visitors the dangers of the iron "container" of the common pan-closet? We hope so.—Messrs. Wilkins & Co., of 39, High-street, Wapping, have issued a sheet called the "Wire-Rope Users' Almanack" for 1889. It contains some very useful and boldly-printed "Observations for Users of Wire Ropes," which should be hung up within sight of all who have the control of lifts and hoists of all kinds. Upon the observance of some of these rules, safety of life and limb, to say nothing of property, largely depends.

**Hayward's Pavement Lights.**—Messrs. Henry Jarvis & Son, architects, have just completed, through Messrs. E. Lawrance & Sons, builders, an important addition and alteration to the premises belonging to Messrs. Hayward Brothers & Eckstein, Union-street, Borough, manufacturers of Hayward's patent semi-prism lights, iron staircases, &c. The most important feature is the excellent lighted basement, which extends to 150 ft. by 70 ft., giving the firm a good opportunity of displaying their ingenuity with their own specialties, and with the best results. The basement is lighted from narrow pavements from two sides, where, in one, 12 in. projection of lights is allowed, and in the other it is not possible to get more than 15 in., as the lights actually extend to the curbing. However, there are various vertical slatboard lights introduced which greatly assist those in the pavement. In the latter every advantage has been taken in introducing light, for even in the van entrances to their stables, Hayward's extra strong roadway lights have been put in. The whole basement is now completely stocked with many hundreds of frames of various sizes and different patterns, some six to twelve of each of about 200 sizes, which alone testifies the grasp which this firm holds on this particular speciality, which has fully merited its success, as an inspection of this basement will show. Messrs. Hayward Bros. & Eckstein will be pleased to show their premises to architects and others interested in the subject.

**The Conssett Sewage Scheme.**—On Tuesday last Mr. Thomas Codrington, Mem. Inst. C.E., one of the Local Government Board Inspectors, held a Government inquiry at the Public Buildings, Parliament-street, Conssett, with reference to the application made to the Local Government Board by the Conssett Local Board for sanction to borrow the sum of 17,000l. for the purpose of carrying out extensive works for the disposal of the sewage of the district of Conssett. At the conclusion of the inquiry Mr. Codrington said that, having satisfied himself of the absolute necessity for the contemplated scheme, he would, in his report to the Local Government Board, recommend their lordships to sanction the borrowing powers asked for by the Board. The engineer for the construction of the works is Mr. Robert Robinson, C.E., of Darlington.



*Epitome of Advertisements in this Number.*

### COMPETITIONS.

## CONTRACTS

## PUBLIC APPOINTMENTS

## TENDERS.

LEICESTER.—For erection of a large warehouse and offices in Leicester, for Mr. George Oliver. Mr. William Millican, architect, Grey Friars, Leicester :—

|                                           |        |   |        |
|-------------------------------------------|--------|---|--------|
| J. Warburton, Mills Platting .....        | £6,896 | 0 | —      |
| J. Parrall & Son, Rugby .....             | 6,733  | 0 | —      |
| J. Mallice, & Son, Bury St. Edmunds ..... | 6,800  | 0 | —      |
| H. W. Hoock, Wolverhampton .....          | 6,485  | 0 | —      |
| J. & C. Bentley, Leicester .....          | 6,485  | 0 | —      |
| J. R. Davis, Leicester .....              | 6,485  | 0 | —      |
| J. Mason, Leicester .....                 | 6,339  | 0 | —      |
| G. Taylor, Leicester .....                | 6,270  | 0 | —      |
| G. Longdon & Son, Sheffield .....         | 6,270  | 0 | —      |
| W. Clark, Barnsley .....                  | 6,219  | 0 | —      |
| G. Tuttle, Leicester .....                | 6,219  | 0 | —      |
| A. Pauls, Loughborough .....              | 6,212  | 0 | —      |
| W. M. Leicester .....                     | 6,191  | 0 | —      |
| G. Hewitt, Leicester .....                | 6,191  | 0 | —      |
| F. Messon, Nottingham .....               | 6,133  | 0 | —      |
| H. Brand, Leicester .....                 | 6,089  | 0 | £5,599 |
| St. John's, Leicester .....               | 6,089  | 0 | 5,631  |
| G. Duxbury, Leicester .....               | 6,050  | 0 | —      |
| T. & H. Herbert, Leicester .....          | 6,049  | 0 | 5,434  |
| W. Gimson & Son, Leicester .....          | 5,990  | 0 | 5,352  |
| St. John's, Leicester .....               | 5,990  | 0 | 5,352  |
| C. Bass, Leicester .....                  | 5,895  | 0 | 5,238  |
| W. Needham, Loughborough .....            | 5,680  | 0 | 6,020  |
| St. John's, Leicester .....               | 5,545  | 0 | 5,470  |
| O. J. Jewell, Leicester .....             | 5,545  | 0 | 5,470  |
| A. Plant, Leicester .....                 | 5,099  | 0 | —      |

LONDON.—For the New Hospital for Women, Easton-road. Mr I. M. Brydon, architect. Quantities by Messrs.

|                        |         |     |
|------------------------|---------|-----|
| Franklin & Andrews :—  |         |     |
| Lascelles .....        | £18,760 | 0 0 |
| Holland & Hannen ..... | 15,368  | 0 0 |
| Dove Bros. ....        | 15,125  | 0 0 |

|                               |        |   |   |
|-------------------------------|--------|---|---|
| Grover .....                  | 14,637 | 0 | 0 |
| Patrick & Son .....           | 14,410 | 0 | 0 |
| Brass & Son .....             | 14,334 | 0 | 0 |
| Chappell .....                | 13,978 | 0 | 0 |
| Kirk & Randall .....          | 13,947 | 0 | 0 |
| Nightingale .....             | 13,924 | 0 | 0 |
| Perry & Co. ....              | 13,872 | 0 | 0 |
| C. Wall .....                 | 13,846 | 0 | 0 |
| Higgs & Hill (accepted) ..... | 13,584 | 0 | 0 |

**LONDON.**—For the erection of new warehouses upon a site at the north-west corner of Tabernacle and Castle-streets, in the Parish of St. Luke, London, E.C., for Messrs. A. Mordan and E. G. Johnson. Mr. Charles Henman, architect, 64, Cannon-street, London. Quantities prepared by Mr. W. T. Throssel, surveyor, 27, St. Lawrence-road, Brixton:—

|                 |        | Old       |
|-----------------|--------|-----------|
|                 |        | Material. |
| Lascelles & Co. | £8,500 | £80       |
| Kimberley       | 4,379  | 250       |
| Maides & Harper | 6,374  | 60        |
| Morter          | 6,036  | 210       |
| Marriage        | 6,038  | 70        |
| Jackson & Todd  | 5,800  | 70        |
| Smith & Sons    | 5,595  | 75        |
| Hoare & Son     | 5,813  | 100       |
| Laurence & Sons | 5,773  | 150       |
| S. Page         | 5,765  | 125       |
| Woodward        | 5,680  | 130       |

|                                                      |        |   |
|------------------------------------------------------|--------|---|
| LONDON.—For repaving portions of Globe-road and      |        |   |
| Mile End-road, for the Vestry of Mile End Old Town:— |        |   |
| Mowlem & Co.                                         | £8,400 | 0 |
| Rutty                                                | 5,800  | 9 |
| W. Griffiths                                         | 5,344  | 0 |
| W. B. Wheeler                                        | 5,243  | 0 |
| Woodham & Fry (accepted)                             | 5,107  | 0 |

TIMBER.

METALS.OILS.

|                              |        |    |    |    |   |    |
|------------------------------|--------|----|----|----|---|----|
| Linseed .....                | ton    | 18 | 10 | 0  | 0 | 0  |
| Coconut, Cochin .....        |        | 28 | 0  | 29 | 0 | 0  |
| Ceylon .....                 |        | 27 | 0  | 0  | 0 | 0  |
| Palm, Lagos .....            |        | 28 | 10 | 0  | 0 | 0  |
| Rapeseed, English pale ..... |        | 32 | 0  | 0  | 0 | 0  |
| "    brown .....             |        | 30 | 10 | 0  | 0 | 0  |
| Cottonseed, refined .....    |        | 24 | 10 | 0  | 0 | 0  |
| Tallow and Oleine .....      |        | 19 | 0  | 45 | 0 | 0  |
| Lubricating, U.S. .....      |        | 5  | 0  | 0  | 8 | 0  |
| "    refined .....           |        | 7  | 0  | 12 | 0 | 0  |
| Tax-Stockholm .....          | barrel | 1  | 6  | 1  | 1 | 9  |
| Archeangel .....             |        | 0  | 12 | 0  | 0 | 12 |



LONDON. For sewer and paving, New-road, Rippith-road, and Smeed-road, for the Poplar Board of Works:—  
*Sewer, New-road.*

|                             |      |   |   |
|-----------------------------|------|---|---|
| Rutty .....                 | £549 | 0 | 0 |
| Bell .....                  | 541  | 0 | 0 |
| Trickett .....              | 528  | 0 | 0 |
| Porter .....                | 503  | 0 | 0 |
| J. Jackson (accepted) ..... | 475  | 0 | 0 |

*Paving and Making-up New-road.*

|                     |        |   |   |
|---------------------|--------|---|---|
| L. Griffiths .....  | £2,110 | 0 | 0 |
| Trickett .....      | 1,972  | 0 | 0 |
| Rutty .....         | 1,790  | 0 | 0 |
| Porter .....        | 1,720  | 0 | 0 |
| W. Griffiths .....  | 1,710  | 0 | 0 |
| Bell .....          | 1,685  | 0 | 0 |
| W. H. Wheeler ..... | 1,547  | 0 | 0 |
| Knight .....        | 1,119  | 0 | 0 |

*Accepted.*

*Rippith-road.*

|                             |      |                 |
|-----------------------------|------|-----------------|
| Glenny .....                | A.   | B.              |
| Trickett .....              | £485 | —               |
| Knight .....                | 441  | —               |
| Victoria Stone Co. ....     | 407  | —               |
| Rutty .....                 | 415  | 380             |
| W. H. Wheeler (accepted) .. | 385  | 349             |
| A. Victoria stone .....     | B.   | Imperial stone. |

*Smeed-road.*

|                         |      |                 |
|-------------------------|------|-----------------|
| Knight .....            | A.   | B.              |
| Trickett .....          | £222 | —               |
| Glenny .....            | 133  | £130            |
| W. H. Wheeler .....     | 128  | 114             |
| Victoria Stone Co. .... | 113  | —               |
| Rutty .....             | 125  | 109*            |
| A. Victoria stone ..... | B.   | Imperial stone. |

*Accepted.*

LONDON.—For rebuilding No. 11, Campden-street, Notting Hill, for Mr. B. Manders, of Barnes, Mr. Alfred J. Bean, architect, Acton:—  
J. Meers, South Kensington.....£385 0 0  
H. Heywood, Hammermith.....355 0 0  
H. King, Kensington, W.....375 10 0  
G. Alfred, Kew (too late).....375 0 0  
F. Collin, Barnes (accepted).....355 0 0

LONDON.—For the erection of new business premises, No. 9, Newman-street, Oxford-street, W., for Messrs. F. Higgins & Sons, Mr. W. W. Gwyther, architect, 43, Lincoln Inn-fields, W.C. Quantities by Mr. J. W. Stevens:—  
Cocks ..... £1,463 | 0 | 0 || Puzy & Lumley ..... | 3,097 | 10 | 0 |
| Asby & Horner ..... | 3,899 | 0 | 0 |
| Mark Manley ..... | 3,852 | 0 | 0 |
| Mark Patrick ..... | 3,835 | 0 | 0 |
| Clidrey ..... | 3,550 | 0 | 0 |
| Brass (accepted) ..... | 3,575 | 0 | 0 |

LONDON.—For new galleries and other works, Seamen's Chapel, Commercial-road, E, for the London Wesleyan Mission Mr. F. Borcham, architect:—  
Knight & Sons ..... £1,320 | 0 | 0 || Howlett ..... | 1,250 | 0 | 0 |
| Gregar ..... | 1,194 | 0 | 0 |
| Claver ..... | 1,180 | 0 | 0 |
| Allen & Sons ..... | 1,093 | 0 | 0 |
| Anley ..... | 1,094 | 0 | 0 |
| J. Holloway ..... | 1,085 | 0 | 0 |
| Chesam ..... | 998 | 0 | 0 |
| Battley (accepted) ..... | 979 | 0 | 0 |

LONDON.—For alterations to entrances St. John's-square Wesleyan Chapel. Mr. F. Borcham, architect:—  
Taylor ..... £123 | 0 | 0 || Long ..... | 98 | 0 | 0 |
| Anley ..... | 98 | 0 | 0 |

LONDON.—For new stables, Barnsbury, for Mr. C. Ingamells, Mr. F. Borcham, architect:—  
Bradford ..... £180 | 0 | 0 || Williams & Son ..... | 163 | 0 | 0 |
| T. Cole ..... | 155 | 0 | 0 |
| J. Anley (accepted) ..... | 144 | 0 | 0 |

LONDON.—For the erection of block of dwellings and shops in the Pentonville-road, N., for Mr. J. G. Walls, Mr. W. Youle, 37, Great James-street, Bedford-row, architect. Quantities supplied by Mr. T. Marcus Houghton, 10, John street, Adelphi, W.C.:—  
Puzy & Lumley ..... £1,710 | 0 | 0 || Hunt, Clerkenwell ..... | 1,985 | 0 | 0 |

MOULSFORD. For new farm-buildings at Moulsford, for Mr. H. B. Morrell, Mr. J. L. Dodd, architect, Reading:—  
Brasher ..... £280 | 0 | 0 || Higgs ..... | 820 | 0 | 0 |
| Smallbone (accepted) ..... | 777 | 10 | 0 |

NORTHAMPTON.—For the erection of the new Church of St. Paul, Mr. M. H. Holding, architect, Northampton:—  
Beardmore ..... £3,120 | 0 | 0 || Roberts & Son ..... | 5,989 | 0 | 0 |
| Reynolds & Son ..... | 5,750 | 0 | 0 |
| Conford ..... | 5,623 | 13 | 0 |
| Green Bros. .... | 4,338 | 0 | 0 |
| Martin ..... | 4,344 | 0 | 0 |
| Wigmore (accepted) ..... | 4,735 | 0 | 0 |

NOTTINGHAM.—For the erection of a pair of semi-detached villi residences, situate on the Gregory Boulevard, the Forest, Nottingham. Mr. Gilbert S. Doughty, C.E., architect:—  
Wheatley & Maule ..... £2,123 | 0 | 0 || Bell & Son ..... | 2,090 | 0 | 0 |
| A. B. Clarke ..... | 1,938 | 0 | 0 |
| J. Cooper ..... | 1,923 | 0 | 0 |
| E. Hind ..... | 1,807 | 0 | 0 |
| Mr. J. J. Adams ..... | 1,800 | 0 | 0 |
| T. Culbert ..... | 1,800 | 0 | 0 |
| J. T. Turtan ..... | 1,800 | 0 | 0 |
| Evans & Woodcock ..... | 1,885 | 0 | 0 |
| J. F. Price ..... | 1,830 | 0 | 0 |
| J. Shaw ..... | 1,773 | 0 | 0 |
| Barlow & Whittaker ..... | 1,762 | 0 | 0 |
| Gilbert & Gabbitas (accepted) .. | 1,760 | 0 | 0 |

STRATFORD, E.—For granite and wood-paving works, at Messrs. Chippendale & Co.'s new factory.  
W. H. Wheeler, 11, Queen Victoria street, E.C. (accepted).....£215 0 0

WATFORD.—For additional sheds and other works, at Croyley Mills, for Messrs. J. Dickinson & Co., Limited. Mr. Geo. Hubbard, architect:—  
The Co-operative Builders (Limited).....£4,079 0 0  
Accepted. [No competition.]

Harrow Mortuary, &c.—We are asked to say, in reference to the list of tenders for this job, which appeared in our last week's issue, that the quantities were supplied by Mr. T. Marcus Houghton.

Leopold Institute, &c., Slough.—Messrs. Ford & Kirtage, of Upper Holloway, write saying that they sent in a tender, amounting to £5,500, for this work, but that it was omitted from the list which we published in the Builder for Dec. 22. We printed the list as we received it.

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## TO CORRESPONDENTS.

R. J. B.—C. D. W. (We have already printed a letter on the subject, December 22, 1888.)—J. B. (Thanks).—T. V. (address noted).—J. H. B.—E. H. B.—D. & Co. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, and not necessarily for publication. We are compelled to decline pointing out books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications respecting literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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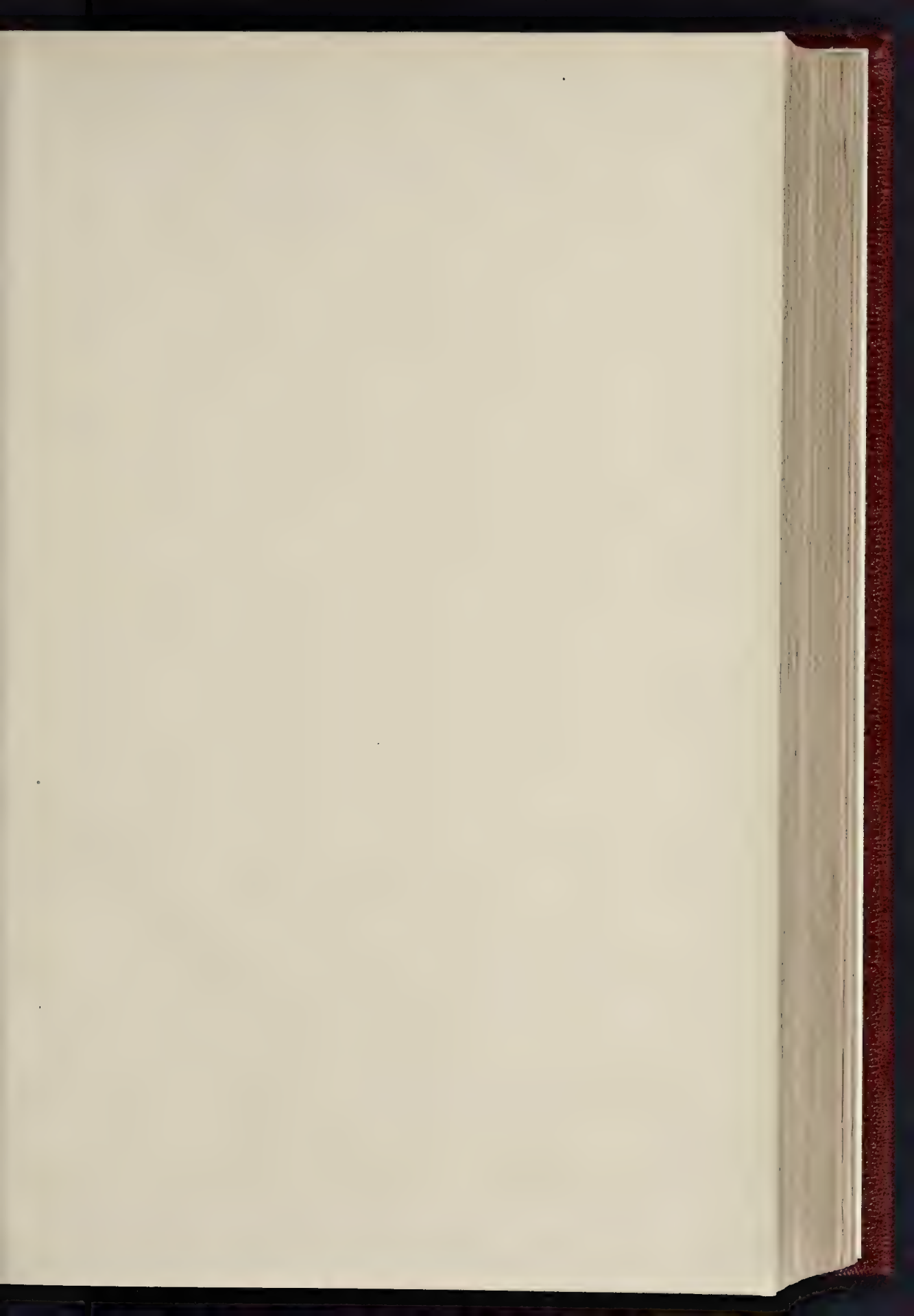
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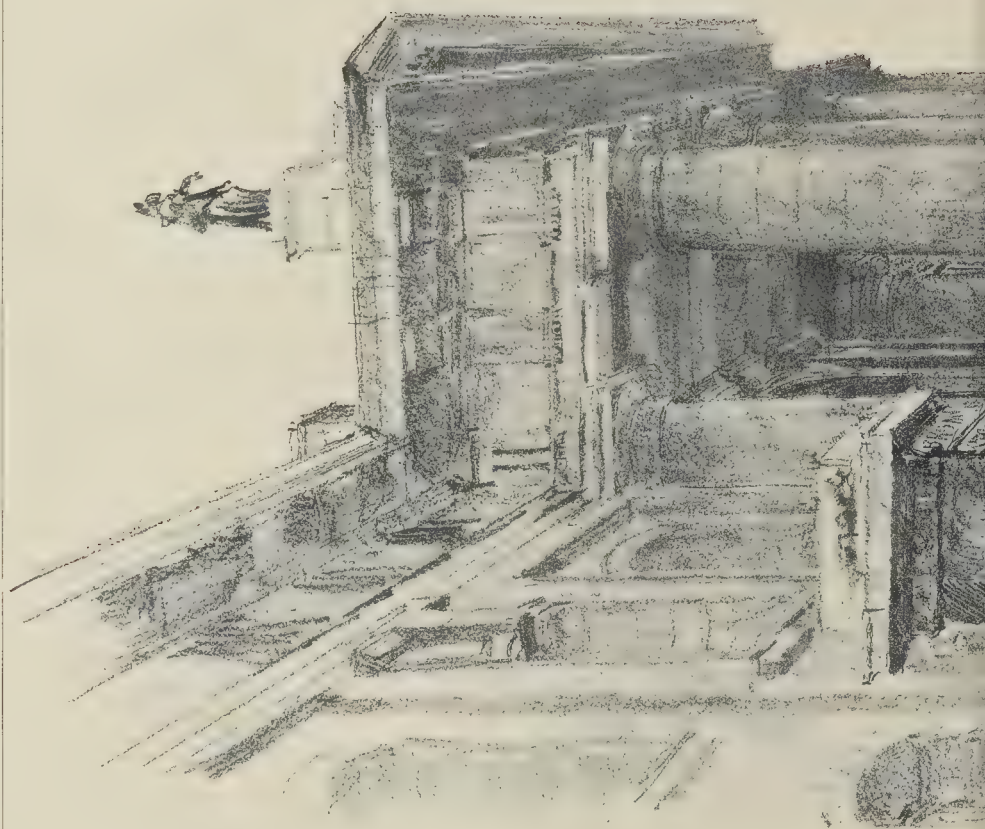
There are still a few districts in which we are not yet represented. Correspondence invited.







THE BUILDER, JANUARY 5, 1889.







The Clarendon Building - Oxford.

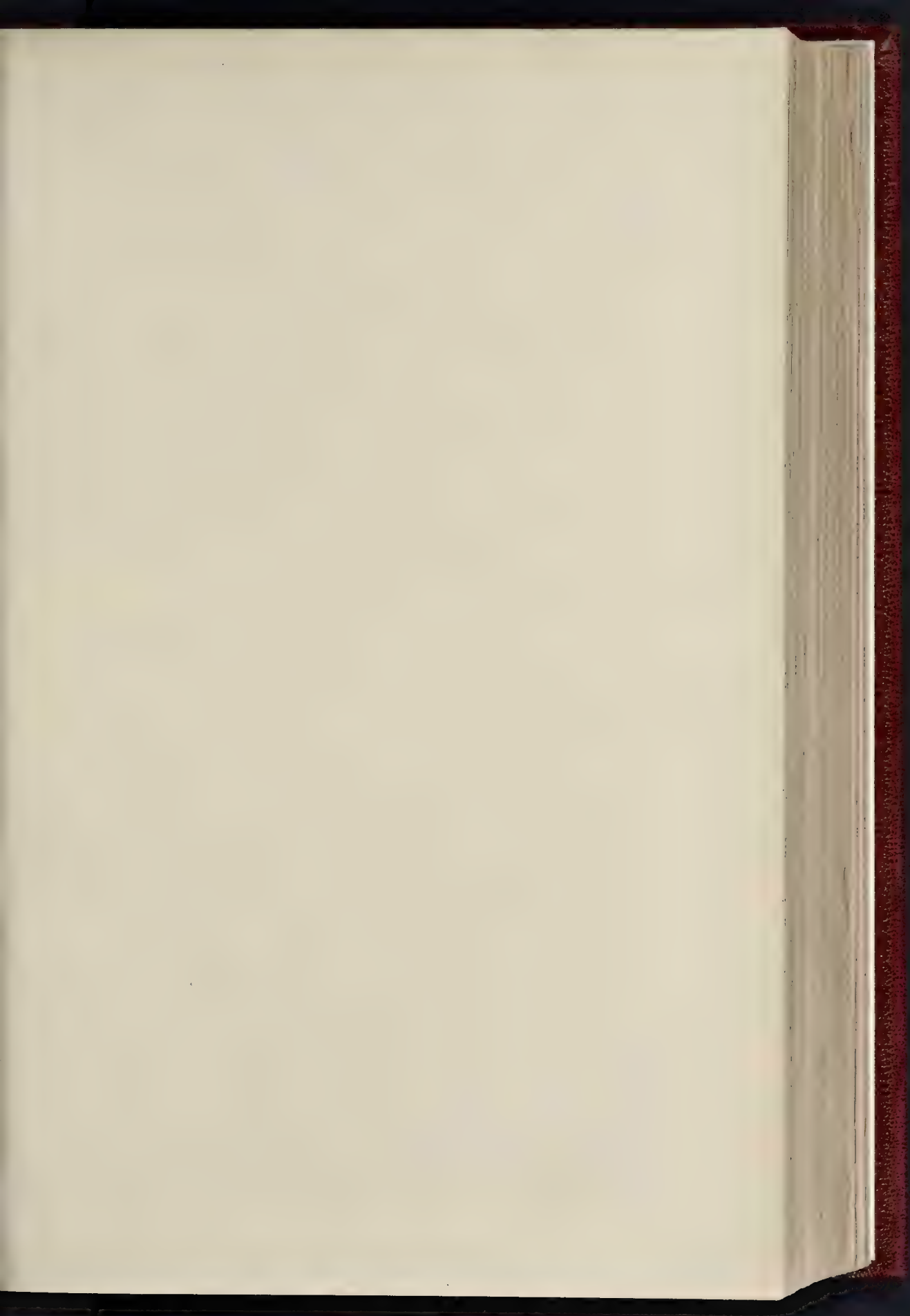
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THE CLARENDON BUILDING, OXFORD. FROM A DRAWING BY MR. JOHN FULLILOVE.











THE BUILDER, JANUARY 5, 1889





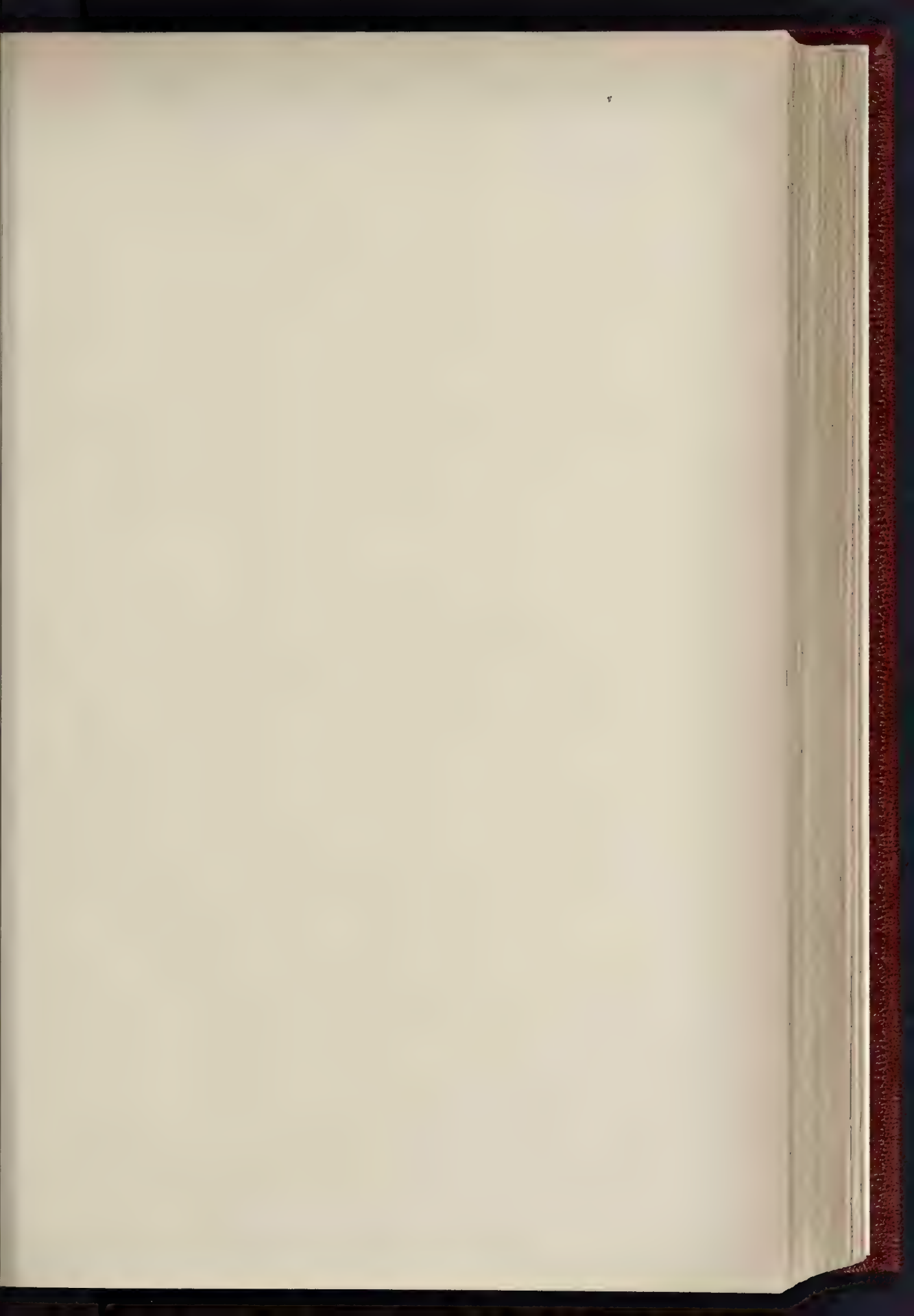


## THE GAMBETTA MONUMENT, PARIS.

M. ROILEAU, ARCHITECT: M. AUBÉ, SCULPTOR.

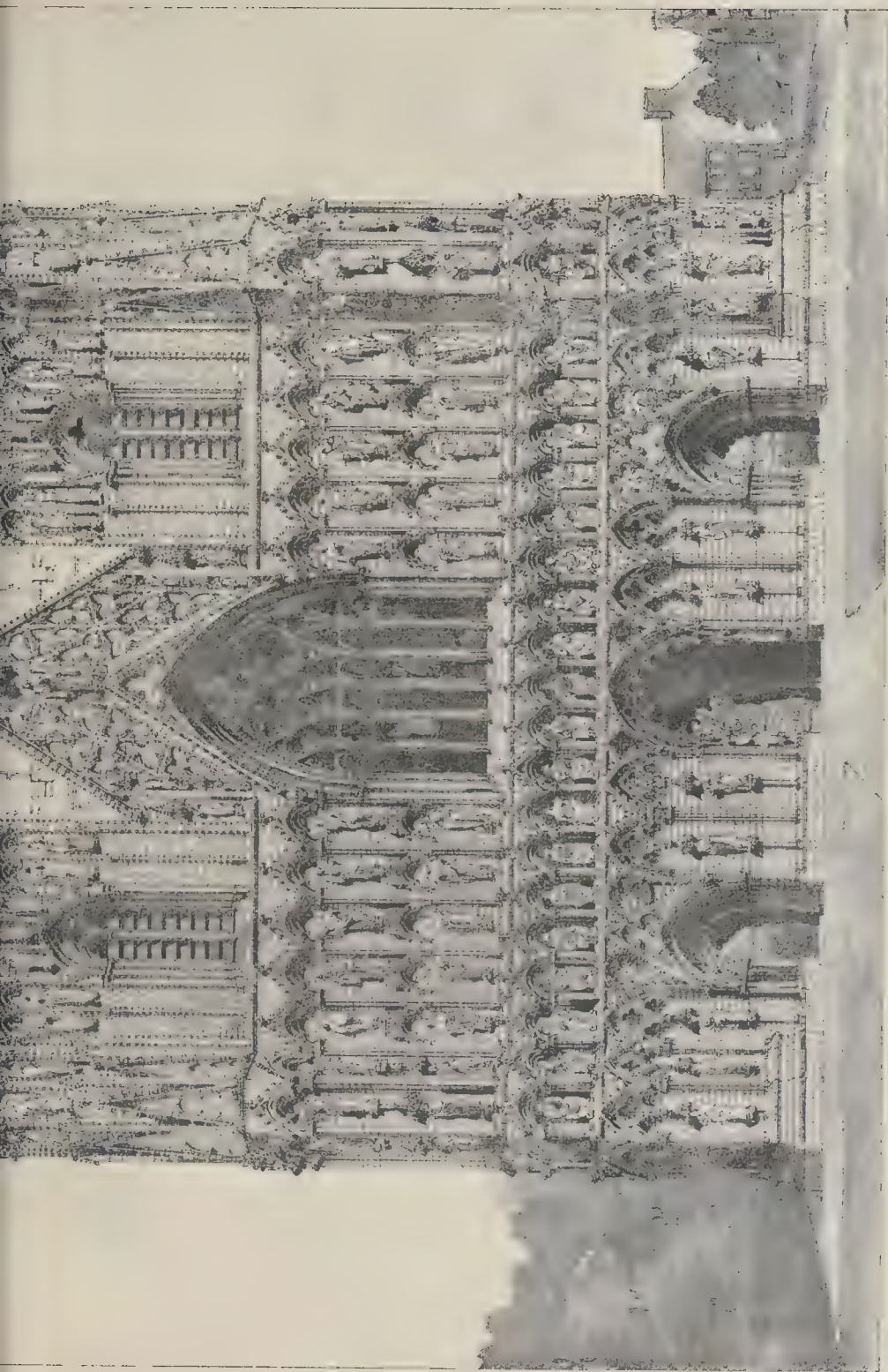








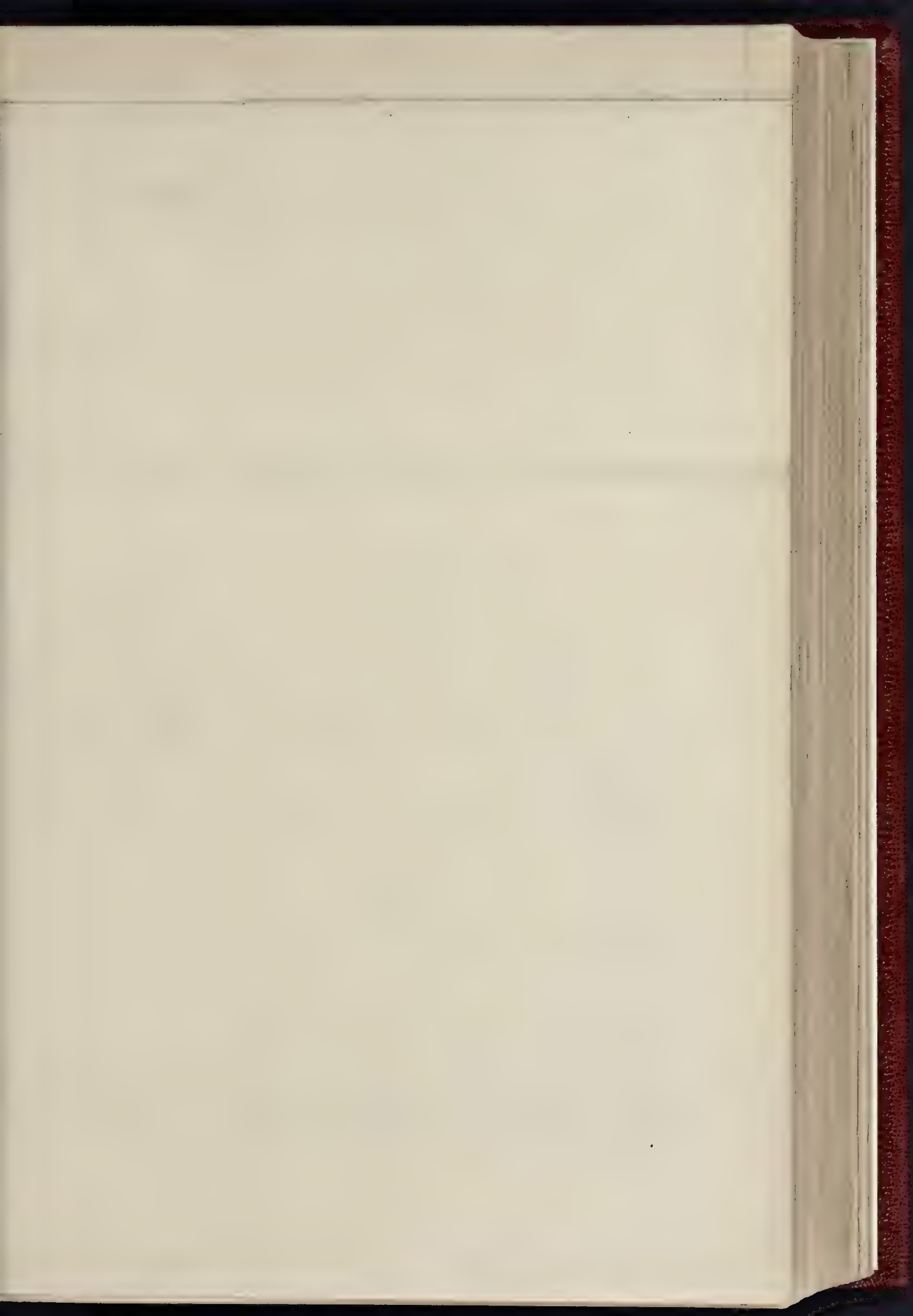


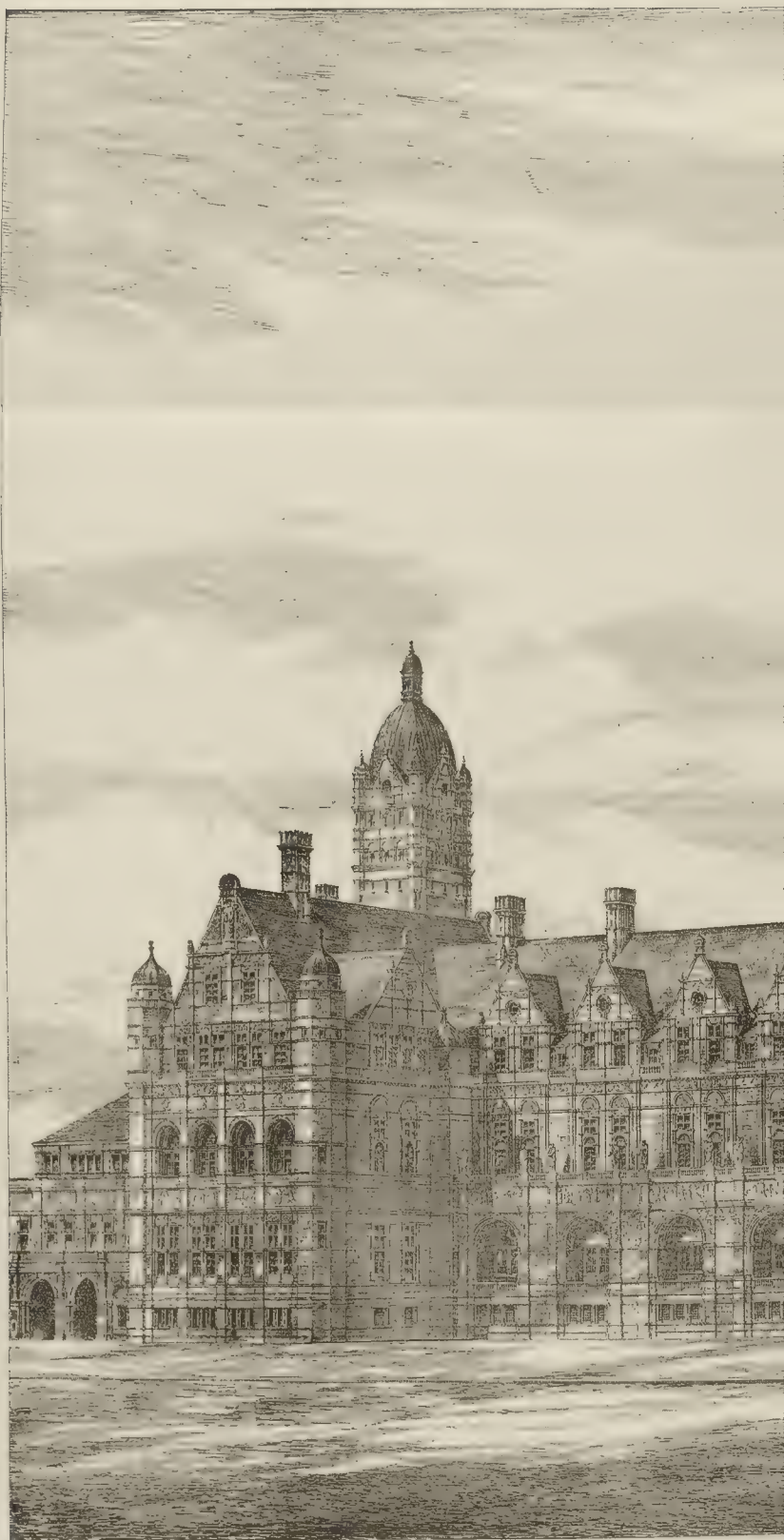


LICHFIELD CATHEDRAL, WEST FRONT. FROM A DRAWING BY MR. ARNOLD B. MUIRHEAD, A.R.D.A.









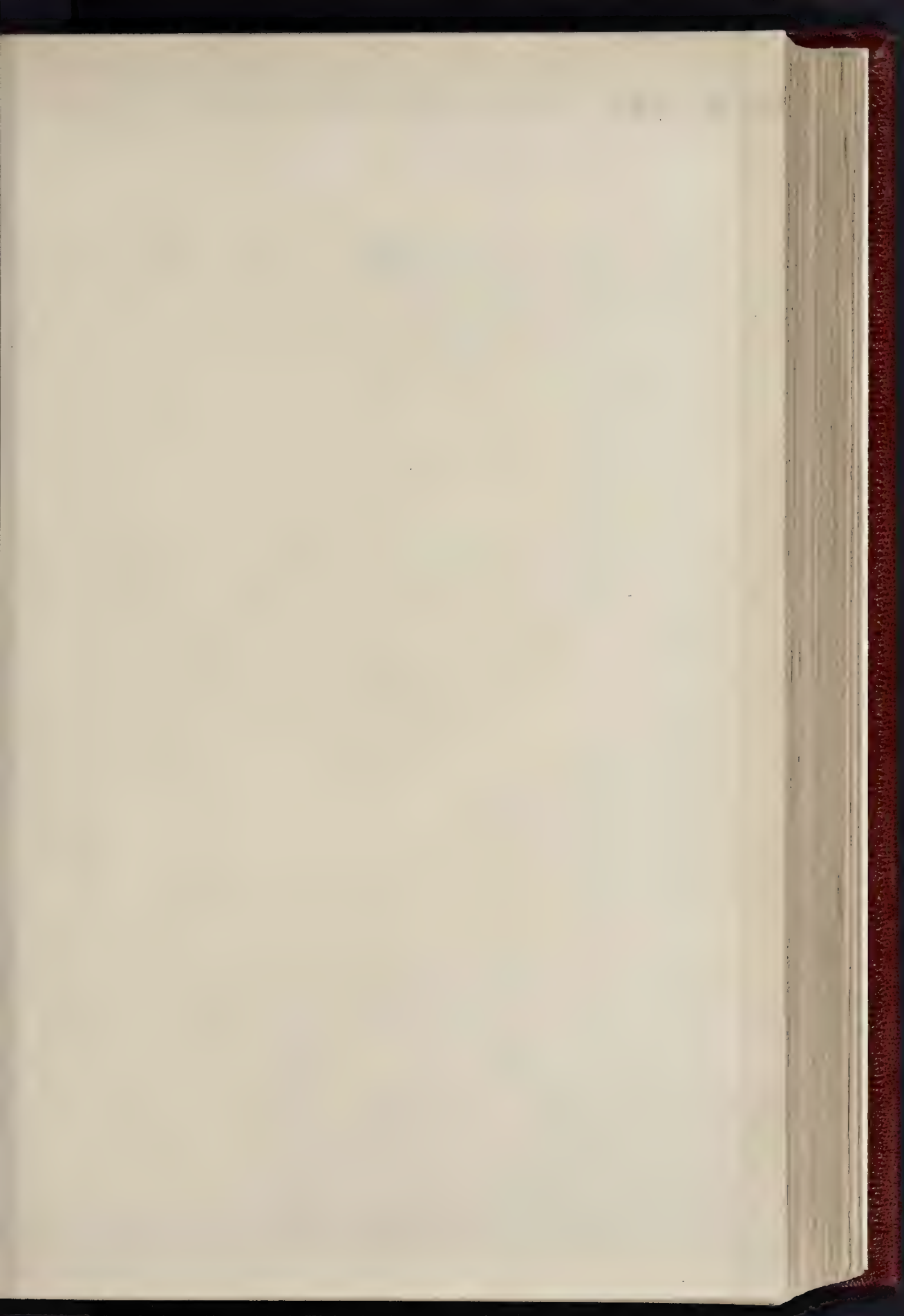




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# The Builder.

VOL. LVJ. No. 2267.

SATURDAY, JANUARY 13, 1899.

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| New Building for the Institute of Chartered Accountants.—Mr. J. Belcher, Architect .....                            | Four Single-Page Photo-Litho's. |
| Competition Design for the Ruthin Grammar School.—By Mr. T. Lewis Banks and Mr. T. L. Worthington, Architects ..... | Single-Page Ink-Photo.          |
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### Haddon Hall.



It is more than a century since Mr. Horace Walpole, on one of his "extremely agreeable tours," visited Haddon Hall, and wrote of it to his friend, George Montagu, as "an abandoned old castle in a romantic situation." To the compiler of Strawberry Hill the place seems to have appealed very little. He wastes no words on its beauties; he does not even give us to understand that he saw any. To him it is simply an abandoned old castle in a romantic situation, and, moreover, one "which never could have composed a tolerable dwelling."

To us, as well as to him, the same view might well occur, even as it had already occurred to the owners themselves,—with much force, indeed, as to lead them to abandon their ancient home. Nevertheless, in spite of Walpole's opinion, Haddon had served as a dwelling, tolerable or otherwise, for a good many centuries before it was deserted.

To stand in the chapel takes us back at once to the days of King Henry II., when Haddon passed from the dead William de Avenel to his daughter's husband, Richard de Vernon. Here stands some of the work which witnessed Richard's marriage, and there is the spot where his children were christened, and his children's children after him for four centuries. Haddon is essentially the Vernon's house. It was Richard de Vernon who received from John, Earl of Mortaigne, afterwards King John, a licence, still carefully preserved, to fortify his house of Haddon with a wall 12 ft. high, but without battlements. The house thus strengthened was by no means the Haddon of to-day. Perhaps something of it remains to us in the lower parts of some of the walls; but it was only in the course of years that Richard's descendants, piece by piece, raised the structure which passes us to-day by its varied outline and regular plan. They it was who gave it its two courts, who reared the lofty tower of the upper court accessible only to pedestrians, and the still loftier tower of the upper court, under which alone the sound of wheels has ever been heard. The Vernons it was who gave the chapel its present form, who filled the windows with glowing glass, and covered

its walls with the ancient stories of the Church. Theirs was the great hall, with its panelled screen, and theirs the huge kitchen, across the floor of which their servants have worn tracks in the stone. To them we owe the battlemented turrets which rise grey and slender through the noble trees, and impart to the place its unequalled charm of picturesqueness and romance,—a charm most justly prized in this age, from the daily life of which all stateliness and picturesqueness have departed. To the Vernons, again, we owe the delicate panels in the buttresses of the entrance-tower, wherein their alliances are set forth on many shields; and by Sir George, the last of the race, was erected the low pointed doorway (fig. 1), over which he carved a great shield of twelve quarterings, and on either side of it the initials of himself and his wife, and over it the proud but bootless prayer, "God save the Vernon." A proud wish! Not God save the king, but the Vernon, who, indeed, was king,—"King of the Peak." But it was a bootless prayer, for Sir George was the last male of his line, and Haddon passed with his daughter, Dorothy, into the hands of the Rutlands; and now,—it is "an abandoned old castle of the Rutlands."

But it is the Rutlands' not by mere possession alone. They have left their mark as well as the Vernons, though more in the way of embellishment than in actual extensive building. To them we owe the long gallery, with its noble bay-windows; by them were fashioned the gardens and the terraces, and the famous flight of steps. They clothed the walls of the long gallery with its beautiful panelling, and theirs is most of the woodwork throughout the place. Some of the windows still show the glass which they put in, and on many a spout we see their badge,—the peacock.

Let us now look round the place at leisure; and, moreover, instead of entering with the tourist of to-day, let us move up the hill to the left, along the north front, past the great projecting end of the kitchen (fig. 2), with its enormous chimney and its little windows to light the fireplace, over which a pleasant bay-window is formed for the room above by sloping the angle of the building. Let us turn the corner at the top by the Peveril Tower, and so let us enter where the wheeled vehicles entered of old,—by a road winding up the hillside from the Bakewell-road, and lying a little way below the newest road of all,—the railroad,—from which now and again arises a puff of white steam; a suggestive object in

the romantic background to the grey towers below. Entering from this direction, then, instead of up the irregular steps that lead to the lower gateway, we pass under a flat-pointed arch of the Vernons (fig. 3), and by the foot of the Peveril Tower to the upper courtyard. In front of us lies the banqueting-hall, with its pointed door and traceried window (fig. 4), speaking plainly of the days of Edward III., when men built in the style we now call the Decorated. To the right and left the lower stories proclaim themselves to be of somewhat the same period,—a little later, perhaps,—but still of the time of the Vernons. But the upper stories, the staircase-tower, with its square, mullioned windows, and the great bay-window (fig. 5), display the workmanship of a later hand, when the house had passed from the Vernons to the Rutlands. The walls themselves may be earlier, but the wrought features are of late in the sixteenth or early in the seventeenth century. In one of the lower rooms, entered through a pointed door, is the start of a winding staircase of the Vernons, which is now cut short and stopped abruptly by the floor of the ball-room or long gallery, which was the work of the Rutlands. With the ancient workmen it seems often to have been thus. They cleared away, whether in church or house, only as much of their predecessors' work as they found to be in the way, and left the old and the new in what we should call untidy juxtaposition, without trying to assimilate the two. And thus the Rutlands fashioned their fine new gallery among the old walls of the Vernons, without caring to pull down more than was just sufficient for the purpose. So, too, it was with the Vernons themselves. When they built the wing lying between the long gallery and the chapel, they completely enclosed an earlier wall, which divides the ground story into two long, narrow, and useless apartments. Projecting from the wall of the gallery in the upper court is the base of a large stack of chimneys, of which the slender shafts have disappeared (fig. 5), and on the top of it are fixed iron gratings to keep the birds from building in the cold flues. Truly, it is "an abandoned old castle of the Rutlands."

To pass from the upper to the lower courtyard we must traverse the "Screens," as the passage was called which the screen cuts off from the banqueting-hall. Leaving the great hall on the left and the buttery-hatch and kitchen doors on the right for future exploration, let us go out into the lower court.



Fig. 1.



Fig. 2.

Straight before us, extending the whole width of the court, is a flight of two or three steps, below which the ground slopes away in one direction to the chapel door, in another to the other entrance-tower, which lies yet six or seven steps lower. It is a curious necessity, this multiplicity of steps in the open court, but it arises from the position of the house on the hill-side, the "romantic situation" which pleased Horace Walpole. Standing as we do by the porch door, we see three distinct tracks in the court below, one from the gateway to the chapel, one from the chapel to the spot where we stand, and one from us to the gateway. They are eloquent tracks; not part of the house, as are the deep foot-prints on either side of the wicket-gate where one generally enters, and yet part of the history of the house; not worn by the inmates, as much of those other two footprints was, but by sight-seers in their daily round, by the thousands and thousands who come year after year to see the place because it is an old castle in a romantic situation, and who can see it all the better because it is abandoned.

To our left as we stand we see the bell-turret of the chapel (fig. 6), now long silent, and from it rises an emblem of our own age,—a lightning conductor. In this small group we read the changes of centuries, we view the impassable chasms that Time is ever imperceptibly opening. Why do the thousands and thousands come here year by year and wear those tracks on the stone court? Because here they can see variety, picturesqueness, and beauty in architecture which they will never see in their own homes. Some, perhaps, come for the sake of history, but most of them are seeking something strange, and what is stranger than beauty in the home of dwellers in great towns? This age can give them comfort (which they will hardly find at Haddon), and, with its passion for scientific research, will grant them glimpses of the fierce storms which sweep across the sun, or map for them the mountains which scar the lifeless face of the moon. It will guide the thunderbolt harmless to the ground, and even press the lightning into its service to deliver its messages. But it cares little about imparting beauty to the home of the common Englishman, and so he comes here to find it, and he departs with the idea



Fig. 3.

that beauty, like the domestic arrangements of the place, has long been out of date. And yet we are not altogether callous, we still preserve what we do not emulate; and so, against the empty turret which once had a voice calling the world to worship, the nineteenth century has reared its lightning conductor.

To the left of the silent turret and the chapel to which it is attached is a wing of the house that was formerly devoted to the immediate use of its lord and his lady,—the same wing which encloses the ancient wall already referred to. Their apartments were lighted by bay-windows looking over the garden, and also by the two bay-windows looking into the court; the flight of steps between these bays and the turret was built, it is said, for their convenience in attending chapel. Doubtless, it was an imposing sight

to see the lord and his lady descend the long flight in stately fashion and disappear with their retainers beneath the arch that led to the chapel: far more dignified than the descent of paterfamilias down the front stairs, adorned with his shining top hat, and engaged in drawing on his tight-fitting gloves. But he of the top hat would hardly exchange his warm and convenient house for the cold and straggling rooms of Haddon; nor, if he had his choice, would he desire a flight of steps to lead from the open courtyard straight into his bedroom; convenience he would expect, but hardly such convenience as that. Walpole was wrong in saying that Haddon could never have composed a tolerable dwelling, for it was not only tolerated, but embellished and loved for over five centuries. But the demands of its builders, like their stately ways and gorgeous apparel, are obsolete, and





Fig. 4.



Fig. 5.



Fig. 6.

the dirt of many years can dimly be deciphered "Margareta Pype"; but who was she? If we search the records, they will tell us that she was wife to the son of the donors of the east window. But to most people,—to most visitors, probably,—Margareta Pype is as unknown as if she had never existed. And yet in her day she presided over the great establishment; she was supreme in the dark kitchen and the high hall; she saw the great gargoyles, as coarse in their humour as Margareta's kindred in their manners; she saw the bell-turret, now silent, and she saw the chapel in all its splendour. But it had not then its present seats. These were added in later days, after the Rutlands came in, and they came in after the days of beautiful glass were over; when saints and angels and bishops and priests were held of small account, and even savouring of superstition. The Rutlands cared less for the building and a little more for themselves, and so they put up fine seats in the chancel, one on each side, and a tall pulpit for the minister in such close proximity to one of the pews that had that functionary been energetic in his expositions, the lord of the place might have found it best to edge away a little. But now the pews are sadly decayed, and the pulpit creaks dismally; the saints and angels, bishops and priests are in grievous confusion, and the paintings on the wall, almost faded from sight, are far outvied by the brilliant green left by the wet streaming through the casements.

Leaving the chapel, and returning towards the great hall, along one of the tourists' tracks, we have on our left a long wing of small rooms of no special interest, and, beyond them, the lower tower. In this tower are several rooms attractive to the sketcher, but not, perhaps, to the general public; they are panelled with seventeenth-century woodwork, and a few of the window-recesses have stone seats at the sides; but they lie out of the most convenient circular route, they are of less intrinsic importance than much of the house, and are not usually shown to visitors. We will, therefore, go straight across the courtyard to the porch of the great hall. To our right are the two bay-windows of my lord's own rooms (fig. 7),—rooms built, as already mentioned, over and on top of an earlier wall, which divides the ground story into two long waste-spaces, needing no more light than can find its way through narrow slits. This arrangement produces incidentally the excellent effect obtained from the solid bases of the bays and the corbelled chimney. On the main building, just at the corner, we see (fig. 7) the Gothic window of the dining-room (put in by the Vernons), and the square, transomed window of the drawing-room (the work of the Rutlands). Further along comes the great projection of the hall fire-place, with the stump of the chimney-shaft above it (fig. 8), and then the porch. All this work, with its pointed doorway, its traceried windows, and its coarse gargoyles, is of the fourteenth century, built in the days which the Black Prince has made famous. On entering we have the hall on our right and the servants' department on the left; the buttery door with its hatch, through which many a gallon has passed; and the long passage which leads direct to the kitchen. What would a modern *chef* say to this dark room, with its monstrous open fireplaces still hung with rusty iron hooks, its numerous and ill-fitting doors, and the post in the middle to prop the floor above? Here are great fixed dressers of solid oak 4 in. thick, and yet worn quite through with centuries of mincing; there a dark bunker to hold the fuel, and a seat in front contiguous to the great fire; yonder are dimly discernible some broken salting troughs. From the kitchen on one side you go into the larder, with rude appliances for hanging huge masses of meat; on another into the bake-house with its dressers, its stone ovens, and an opening convenient for passing bread into the kitchen. Beyond this are other chilly rooms with stone floors and channels cut in them to carry off the water. Everything

c

to us, as well as to Walpole, Haddon could indeed never make a tolerable dwelling.

As the chapel is the most ancient part of the fabric, and the most interesting in its historical continuity, so it is the most melancholy. The glass that portrayed the solemn incidents of sacred history, and the saintly forms of prophets and priests, is sadly mutilated; the inscription setting forth that the glass in the east window was placed there by Richard Vernon and Benedict his wife, in the year 1427, is palpably "restored"; kaleidoscopic scraps of mailed warriors, and flowing garments, and heraldic devices, and diapered backgrounds weary the brain in the attempt to discover what they once meant. Through

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Fig. 7.



Fig. 8.

indicates rude plenty, but our modern chef would shudder.

The great hall need not detain us: beyond a few pieces of antique furniture, there is little characteristic work except in the screen and the gallery. The screen is Gothic, of the Vernons. The gallery is seventeenth century, of the Rutlands,—a note prophetic of the final abandonment of the house. The Rutlands evidently found that the great hall, dividing, as it did, one half of the rooms from the other, was an intolerable barrier to free egress and regress. They, therefore, hesitated not to spoil the appearance of their hall by putting a wide gallery all along one side to give ready access from one set of bedrooms to another. The increased desire for household comfort which their successors experienced could no longer be satisfied by such expedients as this, and so they went. The house no longer composed a tolerable dwelling, and so it became—an abandoned old castle of the Rutlands. The great hall is figured in Nash's "Mansions," and so, too, is the dining-room. Here, again, we see the work of the King of the Peak. Round the top of the panelling goes a long succession of shields bearing the arms which he quartered. On one panel appear the same initials which we have already seen outside the lower tower, G. V.—M. V., and the date 1542, and the words, which speak volumes, "Monseigneur de Vernon." Over the fireplace is carved "Drede God and honor the Kyng," both the King of the land and the King of the Peak. In the quaint bay-window are more panels with heraldic devices, as well as two with effigies of a man and woman, said,—but with no great reason,—to represent Henry VII. and his queen; but by 1542 Henry VII. and his queen had long been dead, and Henry VIII. had disposed of five of his queens. No figure in all the history of Haddon stands out more clearly than this "Monseigneur." He was a great man, he knew it, and he wrote it up on his walls. And when he died he was buried with befitting splendour. He lies in Bake-well Church, on an altar-tomb that already has felt the touch of the Renaissance; he lies in all the pomp of heraldry between his two wives; and no one who looks upon him there would marvel at his being King of the Peak and Monseigneur de Vernon, nor that he should write up over his door, "God save the Vernon."

Over the dining-room is the drawing-room (the nomenclature is modern), of which we owe the ornamentation, at least, to the Rutlands. It is now hung with tapestry, as also are the two rooms beyond it, which have already been spoken of as being more particularly devoted to the use of my lord. In the drawing-room is a bay-window, immediately



Fig. 9.

over that in the dining-room, but the mullions and transoms have been removed (fig. 9), probably by some of the last of the Rutlands who lived here, for the sake of improving the view. Opposite the bay is a door leading on to the gallery, already mentioned as having been put up in order to connect the upper rooms of the two sides of the house.

On the other side of the landing by which we reached the drawing-room is the long gallery, or, as it is called in modern phraseology, the ball-room. This is essentially an Elizabethan apartment. Long galleries were the fashion in her days. Many houses were so built as to contain the longest gallery possible; and Sir John Manners, second son of the Earl of Rutland, when he came into possession in right of his wife, Dorothy Vernon, complied with the prevailing taste. He contrived a long and wide gallery; down

one side he put three bay-windows, the middle one being square and as large as a room, essentially an Elizabethan feature. The walls he clothed with fine inlaid panelling, rich with pilasters and arabesques, and in the frieze he put shields of arms and the badges of Manners and of Vernon. And thus he left it,—a stately room. Beyond the gallery are two more rooms, both rich with the work of the Rutlands; one with steps (called after Dorothy Vernon) leading on to the terrace, the other with another of those spacious bays which mark the times of Elizabeth and James. Beyond these rooms we come to the waste and dismal places in the Peveril Tower. Here, firmly fixed to the floor and the wall, is an instrument which, in the days of its life, served the purpose of stringing bows and cross-bows. This is the only relic that tells of strife, for,—fortunately for us,—the record





Fig. 10.



Fig. 11.

of Haddon is a record of peace, and even this warlike instrument may have been chiefly used in the perennial war carried on against the denizens of the forest. Beyond the Peveril Tower, and over the kitchens, are numbers of rooms of no great interest. Here and there is a beautiful casement-fastener, or some turned balusters to a staircase; but we need not linger in these cheerless rooms, where bits of tapestry, frameless pictures, and empty bookshelves only serve to make desolation more desolate.

Let us rather return to Dorothy Vernon's steps, and pass down them to the terrace. How many people have pictured Dorothy's romance to themselves on the very spot where it occurred? The stately ball-room; the quiet slipping away down the steps and along the terrace to the famous stone staircase which leads to the lower garden; the anxious descent of those beautiful steps, of which the narrow dimensions would inevitably lead to a fatal disaster unless they were trodden with deliberation and care; the furtive glance at the lighted windows; the holding of the breath as the house-door was passed and the room where her father had written himself up "Monseigneur de Vernon"; the long descent from the chapel corner to the river; the crossing of the narrow bridge; the

lover's arms and the successful escape. Who has not pictured these things to himself?—all in happy oblivion that Dorothy was a Vernon, and that the ball-room, and her own particular steps, and the beautiful terrace, and the stately staircase were all made by the Rutlands, and most likely by the very Sir John who carried her off, after he came into possession in right of the heiress he ran away with.

But the halo of romance is far too firmly fixed to Dorothy's brow to be shattered by such reflections, and we still pace the terrace, loving to think she fled along it, and still wonder how she reached the bottom of the stone staircase in safety; and still as we look on the noble front (figs. 10 and 11) we think of its windows lighting her to her lover, although we know that neither they nor the steps were then built, and may even shrewdly suspect that she was in her grave before they were begun.

But, no doubt, true lover as she was, she often watched what we, too, may see at this time of the year,—the brilliant star Venus shining over the hill towards Youlgreave. Houses may rise and fall; Vernons may be followed by Rutlands, and they may all leave their mark century by century, in every phase of architecture; they may be gathered into the

church, and there grandly lie, like the King of the Peak, or for ever kneel, like Dorothy and her husband, Sir John; the home of countless generations may become "an abandoned old castle"; but over Vernons and Rutlands, over us and our children, and our children's children, Venus will still shine.

#### RUSSIAN GRANITE:

WITH REFERENCE TO THE WEATHERING OF GRANITE IN ST. PETERSBURG.



AN interesting feature connected with the weathering of granite in large cities has just come under our notice. We know that this stone decays chiefly by the chemical dissolution of felspar, one of its essential constituents; but the different species of this mineral vary so very much in regard to their durability, that a close inquiry into the suitability of granite for building or engineering purposes must always be accompanied by an investigation into the nature of the species of this mineral. To determine these is by no means an easy task, involving, in the majority of instances, the preparation of exceedingly thin sections of the rock, for examination under the microscope. Or it can be done by isolating the felspar, and subjecting it to chemical analysis. The latter method, however, cannot deal satisfactorily with exceedingly minute crystals, which so often help to make up granites. If the felspar is fresh, the microscope enables one to determine the prominent species with precision. In many instances, unfortunately, the altered state of the rock does not permit of this being done.

The chief kinds of felspar occurring in granite are known as orthoclase and oligoclase, having the following average chemical composition:—

|                | Silica. | Alumina. | Potash. | Soda. | Lime. |
|----------------|---------|----------|---------|-------|-------|
| Orthoclase ... | 64.6    | 18.5     | 16.9    | —     | —     |
| Oligoclase ... | 63.7    | 23.55    | 1.2     | 8.11  | 2.05  |

The orthoclase frequently also has varying, but small, proportions of lime, iron, magnesia, and soda. From this we should theoretically assume, *ceteris paribus*, that those granites containing an abundance of oligoclase felspar are the worst weathering kinds, because of the presence of a greater proportion of soda and lime, at the expense of the potash; and, indeed, this is borne out to a certain extent in practice. But the practical demonstration has been more or less incomplete in all the cases that have hitherto come under our observation,—the granites containing either a superabundance of orthoclase with hardly any oligoclase, or *vice versa*; or other conditions were present rendering the comparison doubtful. We are now referring to those granites used extensively for building or engineering only. Thus in one instance we find a certain Cornish granite having an enormous quantity of orthoclase, weathering much more rapidly than another containing a considerable proportion of oligoclase. This seems paradoxical, but the most superficial examination shows, theoretically, why this is, the former rock having been profoundly modified by various alteration agents, either during the process of its formation, or subsequently; whilst the latter has only been very slightly altered, the mineral appearing to be quite fresh. On the other hand, we find that the latter stone is not quite so durable as certain Aberdeen granites in which the orthoclase is fresh. We have here, then, theoretically, a case showing that when the orthoclase and oligoclase are in a similar condition to each other, the granite containing the former is the more durable. We say "theoretically," because we have to assume that the weathering is due to the particular condition of the felspar. However close the assumption may approximate to what we believe to occur in nature, we are not warranted in definitely stating that it actually does occur. Our knowledge does not establish the point beyond the possibility of doubt. What we require, to settle the



matter, is to find a granite used for building or engineering having in itself the two felspars alluded to in fair abundance, in similar condition, and disposed in such a manner as will lead to their easy identification when weathered. And we have, fortunately, found such a granite.

About sixty-five miles north of St. Petersburg, near Viborg, on the Gulf of Finland, is a place called Pyterlaks, which has for many years supplied the Russian capital with granite. This is the stone to which we refer. It is a beautiful, coarse-grained red rock, known as "Kappakivi," or rotten-stone, a name full of meaning. We are informed by a Russian official geologist that, although the term is now generally applied to the whole stone without prejudice, it originally referred to the weathered portions only, being a quarry name of the same value as the "Burr" or "Barr" of the Scotch quarrymen. However this is, it may be convenient to retain the term "Kappakivi," using it in a general sense, for the material is certainly not of the most durable description. In composition it has the usual biotite mica and quartz, with orthoclase and oligoclase felspar. It is to the curious circumstance connected with the two last-mentioned minerals that we wish to draw especial attention. The large crystals of red orthoclase are surrounded by a concentric band of greenish oligoclase; the former, in fact, may be compared to the kernel of a nut, of which the latter is the shell. The oligoclase weathers very much more rapidly than the orthoclase, having the effect of producing a series of ring-like indentations on the surface of the stone, which, as the decay proceeds, is eaten deeper and deeper into it, until the whole of the oligoclasic shell disappears, leaving the kernel of orthoclase loose. This process, aided by many cracks in the stone, causes it to utterly decay in time; nor is the progress of disintegration at all arrested by the rigorous Russian climate. We have here, therefore, a clear case, showing the superiority, in respect of endurance, of the orthoclase over the oligoclase.

The "Kappakivi" is extensively worked for monuments; all the quays, the columns of the St. Isaac's Cathedral (which, by the way, are magnificent productions), and the monolithic column of Alexander I., are made of it.

Indeed, St. Petersburg may now fairly be called a "city of granite." The Imperial palaces, public buildings, and many private dwellings, are almost entirely built of this material, though many others are of stucco and plaster. Both banks of the Catherine and Fontanka canals, and the left bank of the Neva from the Gulf of Cronstadt to the Foundry, are skirted with high walls constructed of granite. The pedestal of the statue of Peter the Great is said to be one of the largest worked blocks in the world, containing, according to Professor O'Reilly, about 50 cubic yards. Speaking of this block, Sir Roderick Murchison says that it has been reduced to two-thirds of its original size, and that it was found buried in a bog between Cesterbeck and St. Petersburg.

We may also cite the extensively employed granite of Hangö, near the entrance of the Gulf of Finland on its northern shore. It is rose-coloured, having a fine grain, and is considered to be more solid and durable than that from Pyterlaks. A third kind met with, comes from Sordavala, on the northern shore of Lake Ladoga. It is a grey, medium-grained, "granito-gneiss." Both these rocks are worked up into monuments, kerbing, and building stones.

Very large granite works exist in the south of Russia, at Kremenchoug, in the Government of Poltava; whilst other places where the stone is found could be cited on the Dnieper, and in the Urals; but enough has been said to show that the country of the Tsar is not behindhand in producing this beautiful material; whilst we are also taught a lesson, which some people might take to heart, viz., that all granites are not durable, but require as careful selection, to do credit to the material, as do the more perishable freestones.

## NOTES.

**J**OURNALS, architectural or otherwise, which find the "Notes" in our columns convenient to copy from, will be good enough to acknowledge the source of their matter. This has not been done in the January number of a certain small monthly paper dealing with architectural subjects, which, in a paragraph on "The Architect's Province in Detail," reproduces matter from our "Notes" of December 29. The manner in which this is done is as characteristic of the stupidity as of the bad faith of the person responsible for it. We referred to, and partially quoted, a lecture by M. Roger Ballu, reported in the French paper entitled *L'Architecture*. Our contemporary, after giving the name of the French architect as "M. Roger Buller," proceeds to give what purports to be a quotation from his lecture, as reported in *L'Architecture*, translated into English. Unfortunately for this astute journalist, the passage as quoted is not in *L'Architecture* at all; what he has quoted is our own abbreviated summary in English of the general purport of a portion of it, which was not given as a quotation by us, and which is copied word for word from our pages without acknowledgment. In the same paragraph reference is made to a paper read by Mr. Crace at the Art Congress, and a quotation given from it, which quotation is also given in one of our "Notes" of December 29. Mr. Crace's paper has not been published anywhere, and we have ascertained from him that he did not send any copy of it to the journal in question, which appears to have made our "Notes" column a kind of happy hunting-ground. We hope this reference to the practice will be sufficient to prevent its recurrence.

**F**ROM Athens comes the important news that the Acropolis excavations have yielded an important fragment of the sculptures of the east frieze of the Parthenon, and,—to make the good luck complete,—a head in good preservation. Considering the generally defaced state of the Parthenon sculptures, the importance of the discovery can scarcely be over-estimated. Happily, there is no difficulty as to which torso the head is to be fitted on to, as a portion of a wing also remains, which at once marks out the figure as Iris. As the Acropolis Museum contains casts of the Parthenon marbles, we presume the head has already been fitted. Full particulars of its precise state of preservation are not yet known, but it is reported to be of great beauty. Its publication will be looked for with the greatest possible interest, and especially in England. We only hope it may not be unduly delayed. This will probably be the last "find" of great importance, as the precinct of Artemis Brauronia is already cleared, and little remains but the work of levelling up.

**W**E noticed last week the last Winkelmänn's Programm, but the report of the Festeire (we have no convenient English equivalent for either word or fact) delivered on the last Winkelmänn anniversary has only just reached us in the *Berliner Philologische Wochenschrift* for January 5. It was delivered by Professor Curtius, and he took for his subject a review of the chief lines in which archaeological method had made marked advance in the last ten years. Speaking generally, this advance is characterised in a three-fold manner. 1. By the recognition that the remains of ancient civilisation lie strata-wise one period above the other, so that archaeological method is largely analogous to that of geology. 2. The last ten years have yielded a far more accurate knowledge of the alphabet, and epigraphy has come to be recognised as the surest basis of chronology, being less dependent on individual power of perception than any questions of style. 3. Our knowledge of the material in which sculptors worked has been greatly enriched, and notably by the Acropolis—poros discoverers. Professor

Curtius is still the cunning craftsman of the art of speech he always was.

**I**N reference to an article in our last number, "To Lovers of Greek Art," Mr. G. A. Macmillan, the Hon. Secretary of the "British School at Athens," writes to explain that it is in direct connexion with the British School at Athens, not the Hellenic Society, that Mr. Schultz's work at Athens is being done. The subject of the illustration of Greek mouldings was at first brought up at the Hellenic Society, as stated in our article, but Mr. Schultz's opportune visit to Athens and offer to assist in preparing sections of mouldings was made as a student of the British School at Athens, which is now assisting him again with a grant of 75*l.* from its very scanty funds. Not being able to get direct assistance elsewhere, and unwilling to let the matter drop, they decided to strain a point, and make the above-named grant out of the year's income. It is to supplement this grant, which will hardly cover Mr. Schultz's expenses, if the work is to be thoroughly done, that we were asked to assist in making public the appeal aforesaid to architects and others interested in Greek art, with a view both of getting the present work of measuring and drawing the Greek mouldings done, and also of providing the nucleus of a fund for publication. As the subject was first discussed at the Hellenic Society, and the same gentleman is Hon. Secretary both for that Society and for the British School at Athens, we were not entirely clear as to the precise part taken by the two bodies until the receipt of Mr. Macmillan's letter, referred to above.

**T**HE Board of Trade Returns for 1888, just issued, show that during the past twelve months there has been an increase of £2,656,175 in the value of our wood and timber imports, the figures being:—

|                                                   | 1888.       | 1887.       |
|---------------------------------------------------|-------------|-------------|
| Hewn wood and timber...                           | £4,042,407  | £3,235,230  |
| Sawn or split, planed or dressed, wood and timber | 9,638,077   | 7,885,956   |
| Staves of all dimensions...                       | 590,112     | 563,763     |
| Mahogany.....                                     | 374,738     | 304,206     |
|                                                   | £14,645,334 | £11,989,159 |

The value of glass imported in 1888 (including window and German sheet and plate glass) was 700,921*l.*, against 656,794*l.* in 1887. Our principal exports of building material consisted chiefly in cement, of which we sent away 611,328 tons, of a value of 1,160,419*l.*, against 506,090 tons in 1887, valued at 982,776*l.*, this being an increase of 105,238 tons and 177,643*l.* Of plate-glass we only exported 4,348,716 square feet (value 261,013*l.*), against 4,697,142 square feet in 1887 (value 262,880*l.*). Painters' colours and materials were shipped off of a value of 1,447,750*l.*, against 1,347,684*l.* in the previous year. There must have been a large export of building stone, but the Board of Trade Returns do not supply information on that point. Probably whatever else was exported of building material is included under the vague heading, "Unenumerated," which reaches the respectable total, in 1888, of 9,348,725*l.*, against 8,123,551*l.* in 1887, and of which a small fraction comes within the description of building material. Iron and steel, and metals generally, entering now so largely into the building trade, the export figures for the whole year will be of interest. The total value of all metals, crude and manufactured (except machinery), exported in 1888 was 37,074,346*l.*, compared with 34,930,838*l.* in 1887. But by far the largest share in these metal exports is taken up by iron and steel, of which we sent away 3,966,984 tons, of the value of 26,372,755*l.*, last year, against 4,143,028 tons and 24,992,314*l.* in 1887. The smaller quantities exported and the higher value obtained for them in 1888, as compared with the results of 1887, plainly show the tendency of last year's trading, at least in the iron industry.

**T**HE correspondence about the insanitary state of Dublin Barracks, in the *Times*, has elicited an important letter from Sir Robert Rawlinson, urging that the evil



is much more likely to lie in the internal state of the barracks themselves than in anything irremediable in connexion with the site as considered apart from the building. He says:—

"The river Liffey may be purified into a pure stream without benefiting the Royal barracks in any appreciable degree. The entire of the external grounds forming the barrack area may be trenched, disinfected, and paved, without appreciably lowering the fever death-rate in the barracks, as the source of mischief is within the barracks and officers' quarters. And this arises from polluted subsoil, rotten timber in the floors, sodden and tainted basement walls, damp floors and walls, probably internal leaky drains, and what under such conditions is common, a plague of rats. As described in *Leviticus*, the barracks and officers' quarters are smitten with leprosy, and there is no effectual remedy but by removing the tainted material, even to the scraping all the plaster from the walls and consuming all that is burnable by fire. The sodden and rotten walls must be underpinned up to sound material, and entirely new floors be substituted for the old ones. The barrack grounds must be reseeded and drained, and subsequently thorough scavenging must be unceasing. Not less than twice each year barracks, stables, and other buildings should be lime-washed. To accomplish the works indicated means a large sum of money, but not the cost of new barracks. Will the War Department face the necessary expenditure?"

As far as one can speak, apart from an examination of the building and site, which we have not had an opportunity of making, we are disposed to think that Sir Robert Rawlinson's conclusion is the right one.

IN the *Builder* for Sept. 3, 1887, we described the system of treating sewage which was then installed by the International Water and Sewage Purification Company (Limited). The system was then being worked on ground, and with plant, engines, &c., which had been originally prepared for another system, and therefore did not represent the best or most economical working of the Sewage Purification Company's system. The company are now under a contract to treat the sewage for the Hendon Local Board on their system for seven years (for which period, also, they undertook the work at Acton), and it is intended to make the works at Hendon a model example of the working of the system. Mr. Chas. H. Beloe, M.Inst.C.E., is now appointed consulting engineer to the company, who claim that they can now offer a process producing economically and without nuisance a non-putrescible, odourless, and colourless effluent, and a sludge which can be used with advantage as manure, and which at Acton is now entirely taken off their hands at a price, which, if not remunerative (which it is now pretty well known that the treatment of sewage cannot be) offers a return of some importance towards recouping the outlay. The company have purchased a site in Wales for the procuring in the most economical manner the raw material, an argillaceous ironstone, for producing the filtering bed of magnetic carbon or "polarite" through which the effluent is passed in its final classification. The working of the perfected system at Hendon will be a matter of some interest, and we shall give a description of it when complete and ready for action, which it may be, we are told, in some two or three months.

CAPTAIN VINNING takes the opportunity of the interest excited about the recent unfortunate fire at Clouds to draw attention to the system in which he is interested, and which has been adopted by the Government at South Kensington Museum and elsewhere, of keeping on hand a constant water-pumping power, which can be immediately applied, without waiting for fire-engines, in the shape of tubes or cylinders of compressed air in connexion with a water-tank, and from which the air can be at any time admitted to the tank, so as to bring pressure on the water. We have had the details of this system before us for some time, and there is no doubt that the idea of having a pumping-power under immediate control at once, by the mere turning of a lever, for the provision of water to extinguish a fire, is a very taking one. But we

have some doubts whether such a system would find general acceptance. The experiments made with it were most successful, and, of course, there is not the least doubt that such a means of pumping water will answer perfectly well when the air-pressure is complete. But it is one thing to use this as an experiment or demonstration, shortly after filling the cylinders; it is another thing to trust to a compressed air pressure bottled up for an indefinite time for use at some moment which cannot be anticipated. We should be disposed to think it quite possible that in the course of a long period the air pressure would have imperceptibly filtered down, and be found to be much weakened at the moment when wanted. The installation of cylinders which would be impervious to leakage for an unlimited period would at all events be a serious expense in connexion with a private house, and we doubt if the system will be found suitable, except where there is a power at hand, as there often is in connexion with a public building, for recharging the cylinders at stated intervals.

THERE is no mention in the January edition of the Post-office Guide of the new postal arrangements with Australasia, to which we alluded on Dec. 29. This is probably in consequence of the authorities not having come to a decision until after the Guide was ready for distribution; as the first cheap mail for Australia, New Zealand, and Fiji was made up for the Orient liner *Austral*, due to leave on the 4th inst. The new service has had an unfortunate inauguration, for the Post-office officials were informed that up to the evening of the 7th the *Austral* had been unable to get out of the Thames. She was, however, liberated early the following morning. The delay was, of course, owing to the dense fog which prevailed during the early part of the week, and which brought all the shipping to a standstill; but it was certainly a rather bad start for the "long sea route."

WE may remind our readers that a register of patent agents is established by the new Act 51 & 52 Vict., chap. 50, which operates from the 1st of January current. The statute declares that, after July 1 next, no one shall describe himself, by advertisement or other means, as being a patent agent unless he is registered as a patent agent in pursuance of the Act. The Board of Trade will frame rules accordingly, with the proviso that any person who proves to the Board's satisfaction that, previously to the passing of the Act, he had *bona fide* practised as a patent agent, shall be entitled to be registered. Any one who knowingly contravenes this regulation becomes liable upon summary conviction to a fine not exceeding 20*l*. The Act, known as the Patents, Designs, and Trade Marks Act, 1888, defines a patent agent as one who is "exclusively an agent for obtaining patents in the United Kingdom." It was passed on December 24 last.

THE Prussian workman is by law obliged to insure his life, and a revision of the scale has recently been made and promulgated. As far as regards the building trade, we find that, according to Prussian experiences of the dangers to life and limb, the least dangerous callings in the schedule are those of the preparers of asphalt and cement floors; then follow in upward succession the painter and glazier, scene painter, and paperhanger. In the next more dangerous class are included the architect, contractor, clerk of works, stone carver, gas and water engineer, civil engineer, mason, bricklayer, quarry-man, plasterer, and the fixers and repairers of ventilators and outside blinds. More dangerous still are the following trades:—Smiths, carpenters, joiners, and burners of lime, bricks, and tiles; then come housebreakers, tilers, slaters, and fixers of lightning-conductors, telegraph and telephone wires, &c. The highest class is that of the man employed in steam saw-mills and the well-digger, whose life is rated at four times more liable to accident than he of the lowest class, the worker in asphalt.

WE learn that a committee is being formed for reviving, through the agency of the County Council, the right of public access into the parade-ground near to Finsbury-square during such seasons as it may not be needed for the requirements of the Royal London Militia and the Honourable Artillery Company. Situated between Chiswell-street and the old Corporation burial-ground that adjoins Bunhill-fields,—with entrance gates in Artillery-court, which must not be confounded with the Artillery-walk of Milton's time, and in City-road,—this extensive area was once part of Upper and Middle Moorfields, within the prebend of Holywell or Finsbury. It lies in the parish of St. Luke, as taken out (1732) of St. Giles, Cripplegate, without the freedom. By a charter, dated August 25, 1537, relied upon by Major Raikes, the Company's annalist, and to which reference is made in appendix I. to a report of 1844 by the deputy keeper of Public Records, King Henry VIII. incorporated the Company under style of the "Fraternity or Guild of St. George." Contrary to an often-repeated statement, the Company did not originate from the City Trained Bands who rendered signal service during the civil wars. As their title implies, they at first consisted of some of the London cross-bowmen and archers who resorted to the fields round about St. Mary Spital, in the days when Barlow, Duke of Shoreditch, and his mock compeers were in the ascendant. So similarly the Toxophilite Society, established at Leicester-fields in 1781, claim to represent the corps of "old Finsbury Archers," which had latterly formed a flank company of the Artillery Company. After successive migrations to Bloomsbury, Highbury, and Bayswater, that Society entered upon its present quarters in Inner Circle, Regent's Park, just fifty-four years ago. In 1622, the Artillery Company removed from their exercising ground by Tassel, or Tassel, close, Bishopsgate Without, to the New Artillery-yard, or garden, whereof they had obtained a lease, by Moorfields. They occasionally re-visited their quondam quarters at Tassel—close, which, however, mainly served the Tower gunners and the officers of ordnance for practice and proof-firing, as is chronicled by Stow and Pepys. The Company's lease, it appears, provided for the use of their exercising ground by the Civic Trained Bands. So, upon the re-organising, in 1795, of the London Militia, the latter regiment claimed admission. The Company resisted, and for five years with success. But *cedant arma togæ*; a court of law decided against them, and in May, 1800, the then West Regiment of London Militia marched in through the gate in Bunhill-row. Finsbury-square, famous for Lackington's "Temple of the Muses," was laid out, and the houses built, after the designs of Dance the younger in 1788-9; Royal-row, leading northwards, had been replaced by Dingley's City-road in 1761. The Company's Armoury House, to which additions have been subsequently made, was built in 1735.

SEVERAL proposals for providing additional open places of public recreation are at present pending before the Edinburgh Town Council. Preliminary arrangements have been made for the acquisition of the Craiglockhart Hills by the city. The estate of Craiglockhart, to the south-west of the city, was purchased by the Parochial Board about twenty years ago, and upon it was built a new workhouse upon the most improved principles. Since that time the suburb of Merchiston has extended till it has reached the base of the eastmost of the hills, an abrupt and finely-wooded eminence. From this the westmost of the two hills is separated by a valley, which it is also proposed to acquire for the use of the public. Although the site is somewhat isolated, it will probably, ere long, be surrounded by dwellings, and the tax upon the ratepayers of 200*l*. a year will not be great. Indeed, the annual rental will only be transferred from one set of public rates to another, and a public benefit be secured at a nominal cost. The more ex-



tensive range of the Braid Hills, to the south of the city, are also wanted for the use of the public, especially for the city golf clubs, which have a right to play that game upon Bruntsheld Links, which are now situated within the city and intersected by numerous footpaths across which the swiftly-propelled balls fly in a manner most dangerous to pedestrians. The price asked for this range of hills is 11,000*l.*; but, as the estate of which they form a part is under trust, it is necessary to procure the sanction of the Court of Session to the sale. Should the transaction be carried out, it is probable that the Town Council will place a suitable site at the disposal of Government for the erection thereon of a new royal observatory. The grounds of Powderhall, situated on the Water of Leith to the north-east of the city, part of which has been for many years used as a depot by the clearing department, are to be converted into a public recreation-ground. This will be a great boon to that part of the city. The low-lying ground at North Pitt-street has from year to year been assuming a more unsightly appearance, and the numerous temporary erections upon it are apt to prove a nuisance. The Town Council have been approached with the view of this ground being acquired and converted into an open space; but while it is admitted that it would be most desirable that this should be done, it is contended that the price asked is in excess of the benefit which would accrue to the public, who have the Arboretum and Botanic Garden close at hand as places of resort. To the north-west of Stockbridge, a space of ground has been leased as a public park; but the proprietor has now indicated his desire to resume possession with the view to laying it out in building-lots. An endeavour is to be made to acquire either this ground or some other in the immediate vicinity in perpetuity for a public park.

**T**HE Governors of Raine's Charity, St. George's-in-the-East, propose, with assent of the Charity Commissioners, under the new scheme, to sell the existing schools and master's lodgings, together with their site, for the sum of 1,350*l.* The ground, extending over about 5,480 ft. superficial, lies along the southern side of Charles-street, Old Gravel-lane. This charity school, in Fowden's, or Farthing's, Fields, Lower-town, was originally maintained, in part, during several years,—and was ultimately endowed in, we believe, 1736,—by Henry Raine, a wealthy brewer in the locality, for fifty boys and fifty girls. Moreover, Raine built and endowed an asylum for forty girls, to proceed thither from the school. From these latter he willed that there should be chosen by lot, in May and December of each year, two young women, twenty-two years old, for a dot of 100*l.* He stipulated that each successful candidate, whom we may regard for the occasion as *la rose* of St. George's-in-the-East, should have provided herself with a bridegroom from amongst the inhabitants of Wapping, Shadwell, or St. George's-in-the-East. Raine ordained that the wedding should be celebrated in the parish church; after which the whole party, including the charity children, were to go to the Vestry Hall, where, an ode in the founder's memory and praise having been sung, one hundred sovereigns, in a purse of our grandmothers' time were to be presented to the bride. This custom has survived to our own day. The parish church,—one of the few of Queen Anne's "fifty churches,"—was erected in 1715-23 from the designs of Nicholas Hawksmoor, acting, as is believed, in conjunction with James Gibbs, though more probably with John James, the parish having been taken out of St. Dunstan, Stepney. It cost 18,557*l.*, and was consecrated on July 19, 1729, for the then parish of Wapping-Stepney. The altar-piece, representing Christ in the garden of Gethsemane, was by Clarkson; Richard Bridge built the organ in 1738. In the churchyard was buried (1759), in fresh earth, Joseph Ames, author of "Typographical

Antiquities," who, beginning life as a planemaker, became a ship's-chandler in Wapping.

**I**N the German Imperial Budget for 1889-90, the sum of 2,620,000*l.* has been voted for building purposes, many of the items composing the amount being on account only. Of this, 1,075,000*l.* goes to military purposes, chiefly for barracks, the largest sum being 100,000*l.* for the barracks of the Gardes du Corps at Potsdam, near Berlin; and among the smaller ones, 68,000*l.* for a new garrison church at Strasburg. Buildings for the naval service will only reach 49,000*l.* Those for the post and telegraph service, on the other hand, are down for 190,000*l.*, and include Cologne, Aix-la-Chapelle, and Gotha.

**I**N a recent competition for a public fountain to be erected at Munich, the jury was composed of two architects, three sculptors, one painter, and no town councillor. This is as it should be.

**A** COLLECTION of sketches under the title "Our Navy," by Mr. Wyllie, is being exhibited at the rooms of the Fine Art Society, in Bond-street. They are in reality a set of sketches taken during the recent naval manœuvres, for the purpose of making which the artist had special facilities offered him by admission on board vessel belonging to one of the squadrons. They are mostly slight sketches, but of great spirit and interest. The manner in which the modern man-of-war goes through the water, piling it up before her in a great heap of foam as high as her bulwarks, is well shown in some of the sketches. There are some fine studies of the old class of ships also, and some very spirited sketches of work on board, in which figures are the prominent interest, especially "Marine Artillery Working Six-inch Gun." The collection is one which should be seen by those who wish to get a vivid idea of the real appearance of our modern ships of war at sea.

**A**T the Society of Fine Arts' Gallery there is what is called a "Champion Prize-Winners" exhibition of photographs; these being, we presume, photographs which have obtained prizes on various occasions. Many of them appear to be exceptionally excellent photographs, and there are some landscapes, such as the "Head of Derwentwater" (1), which attain an aerial softness and gradation of distance such as is seldom seen in photographs of landscape. We are surprised, however, as we have been in the case of many other photographic exhibitions, to see how little attention is paid by average photographers to architecture,—the class of subject which of all others comes out most successfully in photography. There are only two or three architectural subjects out of nearly 200. One of these is a very fine view of St. Paul's west front, taken by Mr. Bracebridge Hilditch "from a church spire"—we presume from the church on the left going up Ludgate-hill. This has the advantage of getting nearly the whole of the west front visible to the ground line, while at the same time getting the dome and towers from a high point of view, and without distortion. We have seen two other fine photographs of St. Paul's taken over the tops of the houses—one a professional, and the other an amateur one, both of which showed the dome and towers very finely, but both had the defect that the lower story of the nave was entirely cut off from view, giving the idea of a squat, one-story composition, with a disproportionately large dome over it. Mr. Hilditch has managed to avoid this by availing himself of the opening of Ludgate-hill, and the open space in front of the cathedral, and has produced the finest photograph of St. Paul's we have yet seen.

**T**HE Belgian Architectural Journal, *L'Emulation*, reprints the list of medals and honours offered by the Institute of British Architects for this year, with a description of the subjects given for the competition prizes

and studentships, remarking on the encouragement given in England to "Etudes Architecturales."

**A**MONG the names of architects and artists from other countries who are proposed to form part of the "Comité de Patronage" of the International Congress of Architects to be held at Paris from the 17th to the 22nd of June of this year, the following has been invited to represent England on the Committee:—Sir F. Leighton (President of the Royal Academy), Mr. Waterhouse (President of the Institute of Architects), Mr. Herbert D. Appleton (President of the Architectural Association), Mr. Arthur Cates (Vice-President of the Institute of Architects); Mr. Alexander Peebles (Architect to the City of London); Mr. George Aitchison, A.R.A., Mr. C. Purdon Clarke (Director of the Indian Museum, South Kensington), Mr. Charles Barry, Mr. R. Phéné Spiers, Mr. H. H. Statham (Editor of the *Builder*), and Mr. W. H. White (Secretary of the Institute of Architects). Among the members of the Committee of Organisation of the Congress are those of M. Bailly (President), MM. Ch. Garnier and Achille Hermant (Vice-Presidents), M. Ch. Lucas (Secretary), MM. Boeswillwald, Daly, Daumet, Alfred Normand, and Paul Sédille, all Honorary and Corresponding Members of the Institute of British Architects.

#### THE BURLINGTON HOUSE LOAN EXHIBITION.

The statements which appear to be carefully circulated every year in the daily papers, that "this year's Exhibition of Old Masters at Burlington House will be equal in interest to any of those which have preceded it," must be taken *cum grano*. The greatest wealth in English collections of pictures was so largely drawn upon in the earlier years of these exhibitions, that nothing like the same display of works of the highest interest can be made now without drawing again from the same sources from which the earlier exhibitions were drawn, which it is probably not easy to do; most owners of valuable pictures naturally feeling that to have lent them once is enough. It is a fact that a considerable number of the paintings now at Burlington House are of interest historically, or for the sake of the painter's name, rather than in any other sense. There are enough fine things in the rooms to make it a collection of remarkable and special interest; we only complain of the misrepresentation of saying that the exhibition is equal to any of its predecessors, which is not, and, indeed, could not, be the case; there is not material to keep them up on the scale and with the splendour with which they were started.

As usual in the recent years of these exhibitions, the Academy have aimed at providing special points of interest which may atone for the comparative weakness of other portions of the collection. Last year we had the room of bronzes and ivories, which, in fact, proved the most interesting portion of the exhibition, and we should have been very glad to have seen this class of work made a portion of each year's exhibition, instead of confining it to paintings, as is usual. We have not long since made the suggestion (in which one or two eminent R.A.'s, at all events, heartily concur) that in the annual exhibitions of modern work at the Royal Academy two rooms should be devoted to various branches of decorative art and workmanship, instead of devoting such a great space to pictures only, many of them of very mediocre interest; and it would save the way to this desirable end if the winter loan exhibitions were made the occasion for getting together ancient decorative art and art-workmanship, devoting one room to this class of work. That the public would feel interest in this kind of collection we have no doubt; people are always willing now to take an interest in examples of ancient art-workmanship, at all events; and they would, perhaps, thus be encouraged to expect something of the same kind in the summer exhibition of modern work, and to recognise that art belongs to such things as these as well as to pictures.

The "points" of the Loan Exhibition are a



collection of large and magnificent Rembrandts, which extend along the north wall of the large gallery, and a collection of the works of the late Mr. F. Holl, arranged in Galleries IV. and V. This includes some of the best of Mr. Holl's later portraits, among them those of Lord Dufferin (232) and Earl Spencer (198), which, in regard to vividness of characterisation and expression, may perhaps compare with any portraits that could be named, ancient or modern. These two seem to stand out as the finest portraits Mr. Holl ever painted. The collection of a number of his portraits, however, does not alter, but rather confirms, our impression that his position among portrait-painters, from the highest artistic point of view, has been somewhat over-rated, perhaps naturally in the regret felt for his early and unexpected death. His energy was wonderful, and he succeeded always in giving a vivid representation of the personality of his sitters; but he painted too much and too fast for the highest attainment, and in his collected portraits there is an evident mannerism; a system of working upon a fixed programme, so to speak; which was almost inevitable in regard to the number of important portraits which he produced every year,—and most certainly the poetry of colour was not his strong point; most of his portraits were to be quite as striking in black and white as in colour. The "Lord Wolsley" (229) is, perhaps, an exception. Some of Mr. Holl's earlier subject-paintings are exhibited here; they are interesting, though they do not prove that he was not right to turn mainly to portrait-painting. The most successful of them is a very early work, "The Ordeal" (193), painted in 1863, which represents two visitors, husband and wife, in the painter's studio, examining a picture which has been painted for them, the painter and his wife looking on. The coarse-looking man, evidently a *nouveau riche*, poking his eyes-glassed face close to the canvas, is a capital bit of character, evidently painted *con amore*.

Of the Rembrandts, the Earl of Ilchester's "Portrait of the Painter" (157) is a work which positively fascinates the spectator by its almost ferocious force. It looks as if the artist had been determined to leave such a likeness of himself as should strike posterity with awe. It looks almost over life-size, an immense square, very dirty countenance shown full-face, above a half-length in full robes (a translation of the painting-gown, probably, into pictorial drapery), with a large, dimly-seen head-dress, which adds to the sinister power of the whole figure. One could fancy Beethoven painting his portrait in that way, if he could have painted. Sir Richard Wallace's "Portrait of a Young Man" (155), near it, is a curious contrast in execution, and suggests the idea that it has been repainted; it is a much earlier work, however. The same owner's large painting of "The Burgomaster Palekan and his Boy" (156), painted about 1632, shows, however, a much more restrained and respectable kind of face-painting, whereas the "Portrait of the Painter" is dated 1658; there seems to be a lifetime between the two works in an artistic sense. The bright and expressive face of the child in the Palekan painting is noticeable. From Sir Richard Wallace's collection we have also the large and dramatic composition of "The Unmerciful Servant," about ten years earlier than the portrait; a very grand work, in which the "lord" looks also as if he were a portrait of Rembrandt himself. The Queen's splendid "Portrait of a Lady" (160), a full-face three-quarter length, is not indeed beautiful; the face is thin, *faded*, and uninteresting; but it is a wonderful piece of painting in its combination of realistic effect, especially in the painting of the hair and of the multitudinous detail of the lace, with breadth and softness of texture.

The east end of the room is occupied by three or four large Rubens's, the centre place being filled by his noble half-length portrait of the "Earl of Arundel" (169), clad in armour, a picture quite Titianesque both in its colour-effect and in the look of chivalric and patrician dignity imparted to the figure. The Queen's picture of "The Shipbuilder" (167), is appropriately placed next to the line of Rembrandts, for there is something in the stern, square face and vigour of the principal head, which suggests a connexion with Rembrandt. The Rubens at the other side, the "Marriage of Mars and Venus" (70), lent by Mr. Colnaghi, is either unfinished (though there is no hint of this in the catalogue), or the painter

has been unsuccessful in attempting to treat the nude figure of Venus in shadow. The figure looks not so much shadowed as bloodless, and this is so unlike Rubens in general that we feel convinced the picture is unfinished, and should have been so described in the catalogue.

Among the other pictures in the large gallery is a curious Hogarth "Portrait Group" (143), more interesting historically than artistically; a fine Constable, "View on the Stour" (177); a landscape with figures by Gainsborough (179), mannered in the landscape, and much faded in colour, but remarkable for the beautiful grouping and character of the figures in the foreground; and a painting of "The Wave," by Turner (181), not very like a wave, with all reverence to Turner.

In the First Gallery the most noticeable things are two paintings by the late C. R. Leslie, which are masterpieces in their way, and in delicacy of conception and execution far beyond some of those, such as "Sancho Panza and the Duchess," by which he is more popularly famous. These are a small painting, crowded with figures, of the scene of the reading of the will in "Roderick Random" (33), in which every figure is a study; and a larger work, representing the scene in the "Vicar of Wakefield" where the two town "ladies" are expatiating to the accompaniment of Mr. Burchell's "Fudge!" Burchell is a little too youthful-looking, but the other characters are drawn to perfection,—the lively Olivia; Farmer Flamborough, fat, goodnatured, and stolid, and his two daughters, "haunting with red top-knots"; and it is remarkable with what delicacy and reserve Leslie has indicated the character of Lady Blarney and Miss Skeggs. This is the more brought out by comparison with another "Vicar of Wakefield" picture by MacIise, the "Tumt the Slipper" scene (45), hung as a pendant to Leslie's. MacIise has been more bold in his portrayal of the town women, who are entering at the door (and are on a larger scale than any of the figures in the room); they are so palpably women of bad character that they could hardly have deceived even simple Dr. Primrose; but the rest of the painting is hard and vulgar indeed in comparison with Leslie's. In regard to the latter, one cannot help thinking, who is there now who could paint such a scene with such insight into character and such refinement of execution? There is more intellect required for that kind of creation than for "decorative painting" with no human element in it, whatever the decorative artist may think.

It is curious to see how these reputations of a generation back are affected by the re-exhibition of their works. Leslie's is one that will stand the test, and, indeed, is rather raised by it; MacIise's is a reputation that is gone, it is no use to produce his pictures now. Augustus Egg is another recent English painter who is represented in this exhibition. He shapes far better than MacIise; his "Peter the Great seeing the Future Empress for the First Time" (23) is a very good piece of painting and of character too; but "The Stricken Deer" (26) is too absurd. William Dyce's small picture of "Jacob and Rachel," often engraved (27), stands the test well; it is purely conventional painting, but the head of Rachel is no contemptible echo of Raphael, in its beauty and purity of design and expression. Near this are three beautiful examples (30, 31, 32) on a small scale of the art of J. F. Lewis, a painter who was to Eastern life what Mr. Tadema is to Roman life. These are works that will keep their value unimpaired by time, which, as already observed, cannot be said of some other names of a generation or two past whose works come up again here. Etty's "Coral Finders" (29) is a piece of clap-trap that people will scarcely look at now; it must be said, however, that his little picture of "The Bathers" (28), of which there is a larger and inferior replica at South Kensington, vulgar as it is in sentiment (or, perhaps, rather in its total want of sentiment), is a most masterly piece of painting of the nude, and as such, perhaps, could hardly be surpassed. Bonington's "On the Coast of Picardy" (14) is a charming landscape in its way, but has that indefinable air of being "composed" which belongs to the landscapes of his school. The works by William Collins hardly keep their place. His "Doubtful Weather" (22), which was engraved in the *Art Journal* of old days, tells far better in the engraving than as a painting; the old fisherman is a very characteristic figure, but when one looks at the conventional

water and conventional boat (the latter with scarcely a bit of boat-iness about it), one feels what a gap there is between Collins and Hook. Turner's "Quillebeuf" (49) is a fine thing, awfully cracked and battered, unfortunately. The finest landscape in the room is the small one by Linnell, "The Purchased Flock" (48), a solemn little mountain landscape with a beautifully aerial sky behind it, and a flock of sheep driven off in the foreground, the treatment of which reminds us, more than Linnell's pictures usually do, of the fact that Linnell was the friend and admirer of William Blake.

The second room contains, as usual, the Dutch pictures that have been lent, but they are a great descent in interest and quality from previous years. The best are Jan Steen's portrait of himself (77), lent by Lord Northbrook, and showing as disreputable a boor as in a portrait group of the painter and his family exhibited here in a former year; and his picture called "The Doctor" (80), also lent by Lord Northbrook. But this room contains an interesting collection of works by Watteau and Lancret, from Sir Richard Wallace's collection, among which "The Music Party" (97) may be singled out as one of the most brilliant and effective pictures Watteau ever painted, though not one of the most refined. The finest example of the peculiar grace of Watteau's fashionable groups posed amid trees and lawns is the "Rendezvous de Chasse" (102), a charming work of its class, which has been not infrequently exhibited. Near it is an exceptionally good specimen of Greuze, "Heloise" (103).

The water-colour room is again devoted to Turner, in two groups of drawings, one half of the room being devoted to miscellaneous finished drawings of various dates, and the other half to the extraordinary collection of Rhine sketches, now belonging to Mr. Ayseough Fawkes, which are said,—and there seems no reason to doubt it,—to have represented just a fortnight's work. They were done on originally white paper, stained grey in a dish full of the required tint, so as to allow of scraping out lights for quicker work. As hasty sketches, they form a remarkable collection indeed, worthy of the fame of Turner. Among the finished drawings there are a good many of the latest period, showing wonderful luminous effects, such as "Heidelberg" (17) and the "Lake of Nemi" (21), which, as representing nature, are unreal and impossible; but it may fairly be answered that the effect would have been glorious if the real scenes could have been seen lighted and coloured in that way. The earlier drawings are, however, to our judgment, the finer works. Among them may be specially named "Cader Idris" (10), painted in 1800; "Falls of the Clyde," 1802 (12), and "Edinburgh," 1802 (14). This last is a very grand view from the end of the city opposite to Arthur's Seat, showing the Castle on the right in the middle distance, and the Calton Hill and Arthur's Seat in the distance; Arthur's seat being unceremoniously turned round, and placed with the precipitous side on the left of the spectator, and the long slope going off to the right, in contradiction to the actual facts of its position, because it suited Turner's composition—a curious example of the autocratic way of manipulating scenes to suit his pictures, which is so often illustrated in the works of the great landscape-painter, who has been asserted by Ruskin to have been as remarkable for his topographical accuracy as for his poetic and imaginative power.

**Admissions to the Architectural School, Royal Academy.**—In reference to the list of admissions to the Architectural School of the Royal Academy, which we printed in our last [p. 11], Mr. Joseph G. Oakley writes pointing out that we printed his name "J. G. Oakley," instead of Oakley. So we did, but the mistake was not ours. We printed the list as we received it.

**Monument to Garibaldi.**—The committee for the erection of a monument to Garibaldi at Milan has selected the design of Signor Ettore Ximenes. It consists of a high pedestal raised on steps, and having on either side groups representing Revolution and Freedom. The General, on the top, is on horseback. The artist was assisted in the architectural details of his design by Signor Augusto Guidini, of Milan, and the cost is estimated at 200,000 lire, equal to about 7,300*l*.



### Illustrations.

#### STATUE OF THE QUEEN AT WINCHESTER.

**W**E give illustrations of three different aspects of this remarkable example of modern sculpture, by Mr. Alfred Gilbert, a replica of which was exhibited in the Royal Academy this year, on which we commented at some length at the time.

The work is bronze on a granite pedestal, and, as will be seen by the illustrations, it is emphatically an all-round work, in which thought and design are bestowed on the back as well as on the front view, every detail having interest and meaning. The treatment of the drapery of the principal figure is remarkably bold and grand in style; the whole work may be said to mark a new departure in modern monumental sculpture.

Mr. Gilbert wishes us to say that he has been assisted in the treatment of the pedestal and the architectural details of the throne by Mr. J. H. Ince.

While expressing our admiration of the work, we regret to have to record, with no little indignation, the disgraceful treatment to which it has been subjected, apparently for some reasons connected with local political feeling, at the hands of the enlightened populace of Winchester. The work has been wantonly damaged in various ways since its erection, and the beautiful little figure of Victory, on the globe held in the hand of the figure, has actually been forcibly torn away. It is a pity so fine a work was not put up in some place where it would have been appreciated, instead of being sent among barbarians.

#### NEW BUILDING FOR THE INSTITUTE OF CHARTERED ACCOUNTANTS.

We give this week plans, elevations, and sections of the design for this building, by Mr. John Belcher, which was selected in a limited competition.

The following extract from the report sent in with the drawings will explain the architect's intentions:—

"The complications and difficulties which invariably arise from a disregard of 'ancient lights,' &c., in the City of London make the condition imposed upon the competitors in Clause 8 a most important one. The author has complied with this requirement by keeping the height of the west wall within the 10 ft. above the existing parapet. He has also kept down that portion of the building opposite some very valuable 'lights' on the south front in Great Swan-alley to subvert the present angle of light. The narrowness of Cross-key-court also makes it imperative to respect the ancient lights therein. These have been considered, and are shown on the plans and sections.

An important advantage in respecting neighbouring ancient lights is that the Institute will be enabled to insist upon the respect of all the existing rights of the buildings now on the site.

The obligations as to rights of light the author has endeavoured to turn to account in the disposition of the several parts of the building.

For example, the area necessary for respecting the light in the narrow passage of Cross-key-court has been utilised for the staircase of the Institute, and, by setting this back on the upper floor, a maximum of light is provided to the staircase and passages in the centre of the building, a light which cannot be destroyed when buildings are erected on the present vacant ground on the east of Cross-key-court.

The ancient lights have also determined the position of the hall, which is lighted, not only on all sides, but has in addition three large domes, so that a valuable top light is obtained for the necessary examinations. Indeed, the lighting of the several departments has been made the guiding principle throughout.

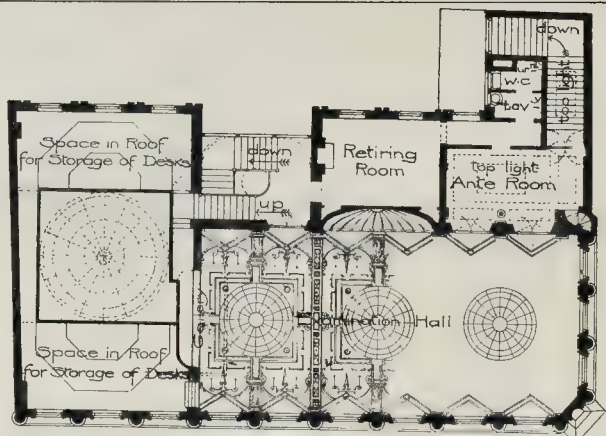
The author has endeavoured, in the design of the elevations and principal rooms, to express a proper stateliness and dignity befitting a public institution. Solidity and gravity are secured by the attached colonnade and rich overhanging cornice. Frivolous gables have been avoided, as more suitable to domestic and School Board work. It has been sought to avoid the sameness of the usual Classical elevations by some novelty of treatment and variety of detail.

The hall is marked externally by the columns, between which a space is arranged for a suitable sculpture frieze, representing the Commerce and Industries of England and Wales.

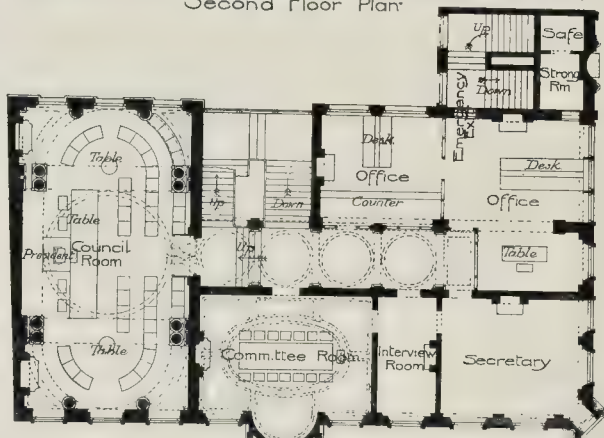
The entrance to the Institute is so placed as to be near the library and offices, and where carriages can drive up and set down conveniently.

The public entrance and staircase is at the south-east corner, and serves for the offices, &c.

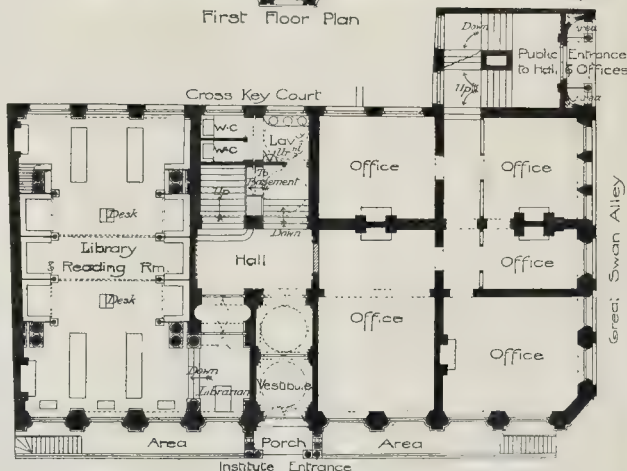
In order to obtain the necessary height and right



Second Floor Plan



First Floor Plan



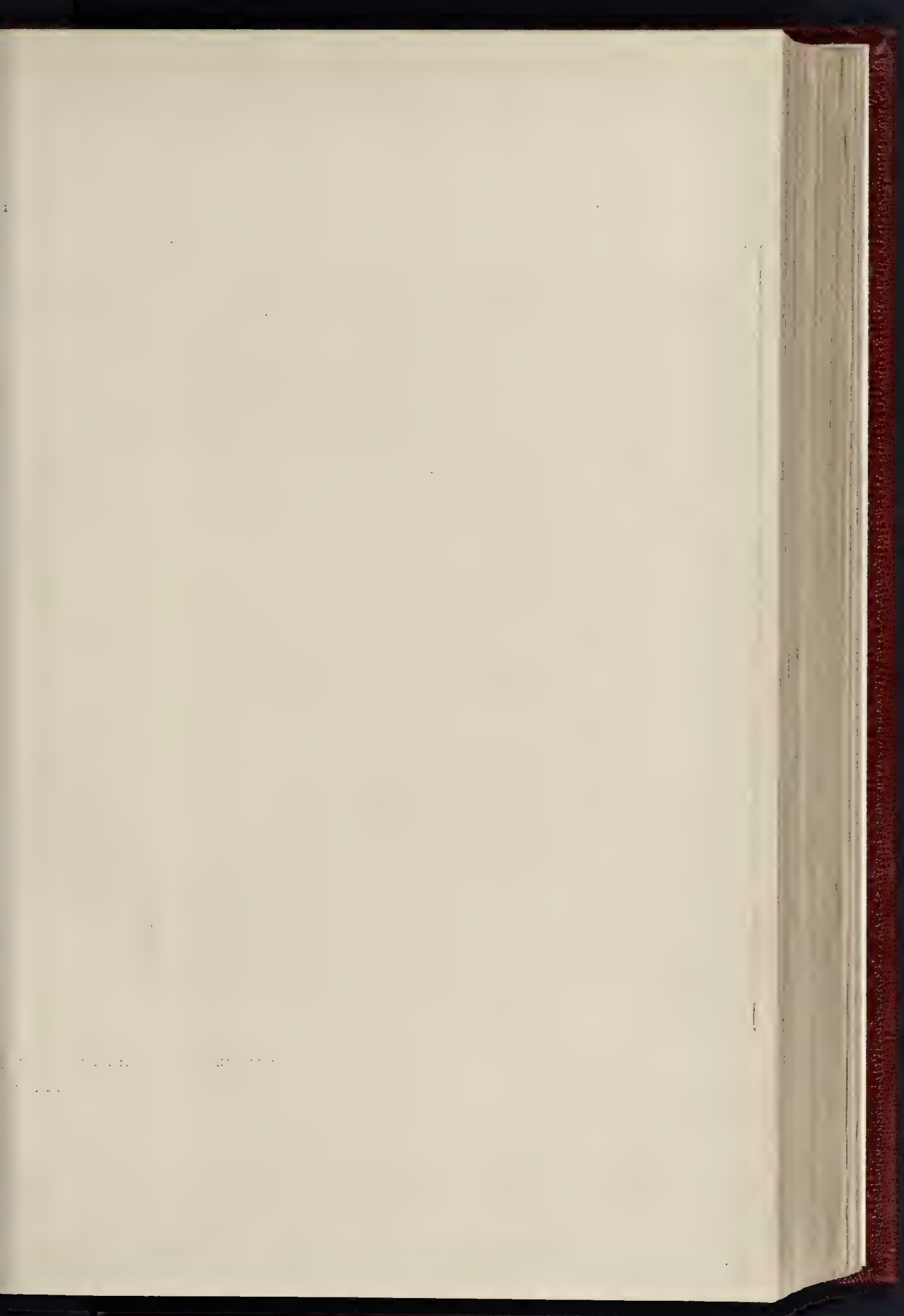
Ground Floor Plan

Scale of 10 20 30 40 50 feet  
New Building for the Institute of Chartered Accountants.—Plans.

proportions for the library and council-chamber, these have been placed on the north end of site, with the further advantage of securing the quiet and retirement for such rooms in the heart of the City.

The offices of the Institute are placed on the first floor, and have been so disposed as to be convenient for working; the committee-room being next the council-chamber, the waiting-room between it and the secretary's-room, which is in a central position



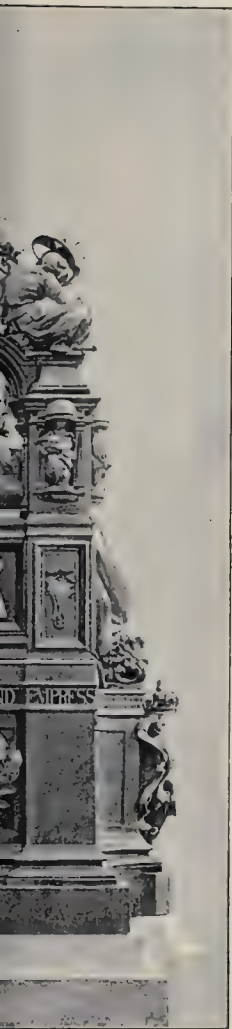




STATUE OF HER MAJESTY THE Q

Mr. ALFRED





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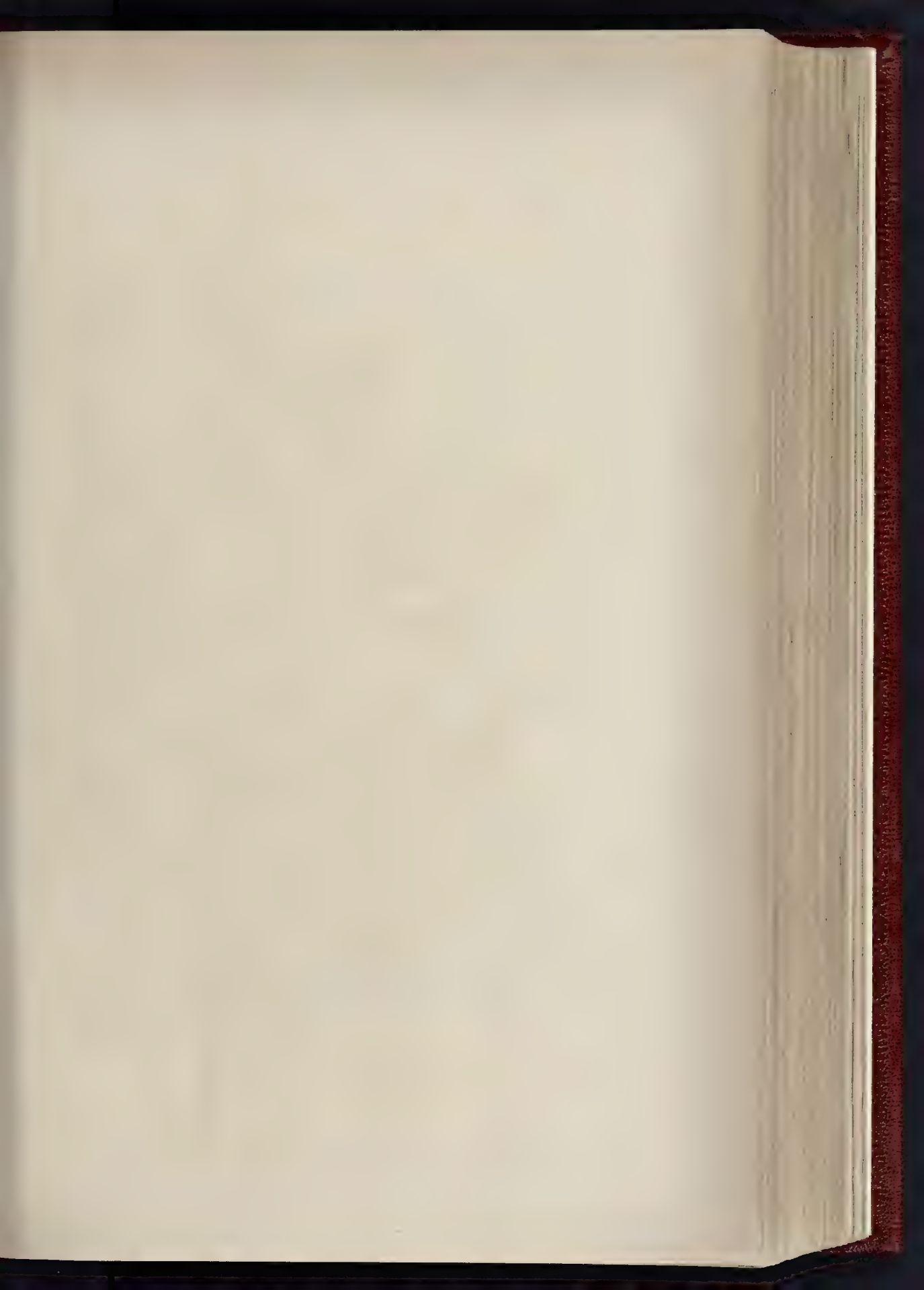




THE BUILDER, JANUARY 12, 1889.





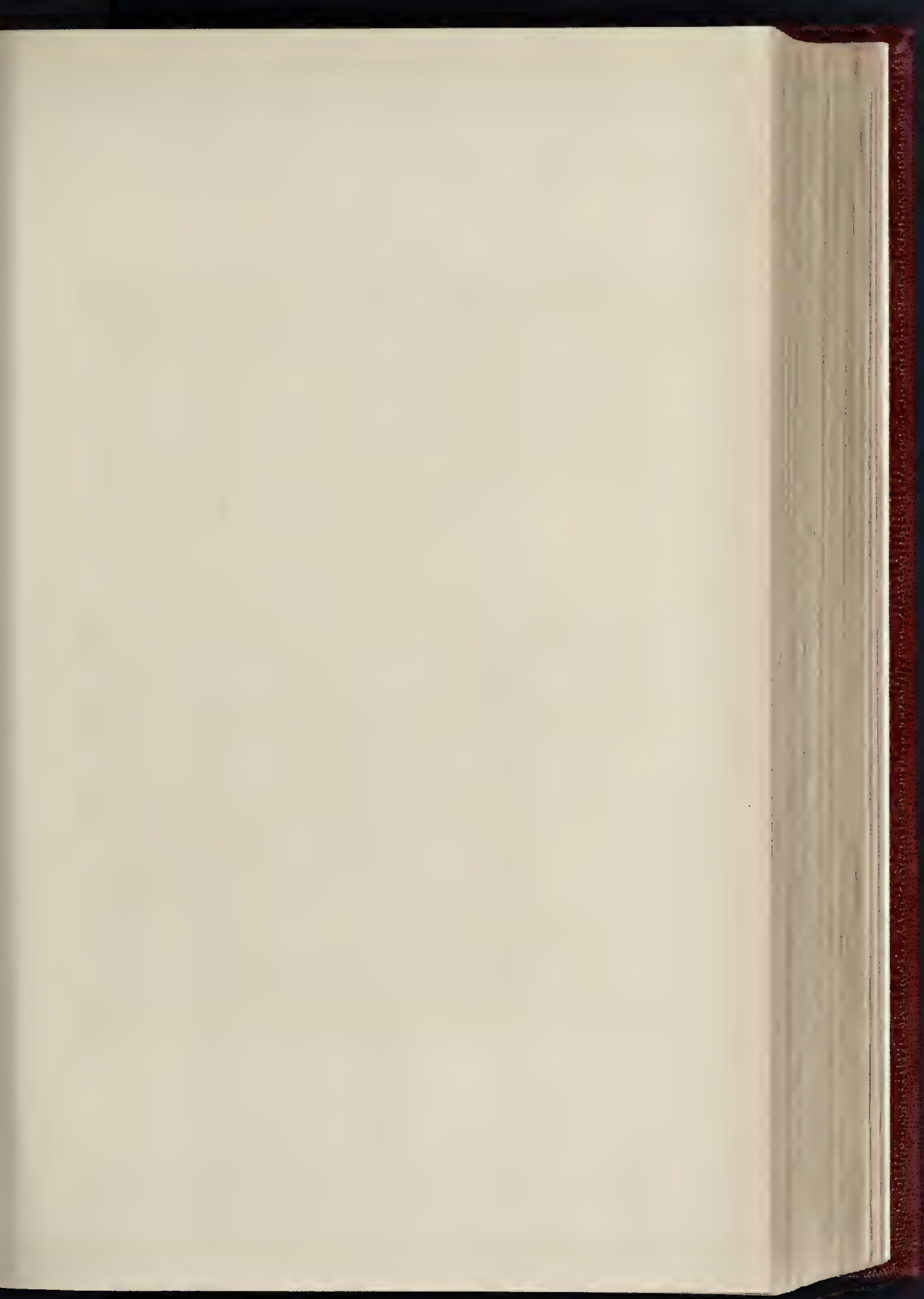


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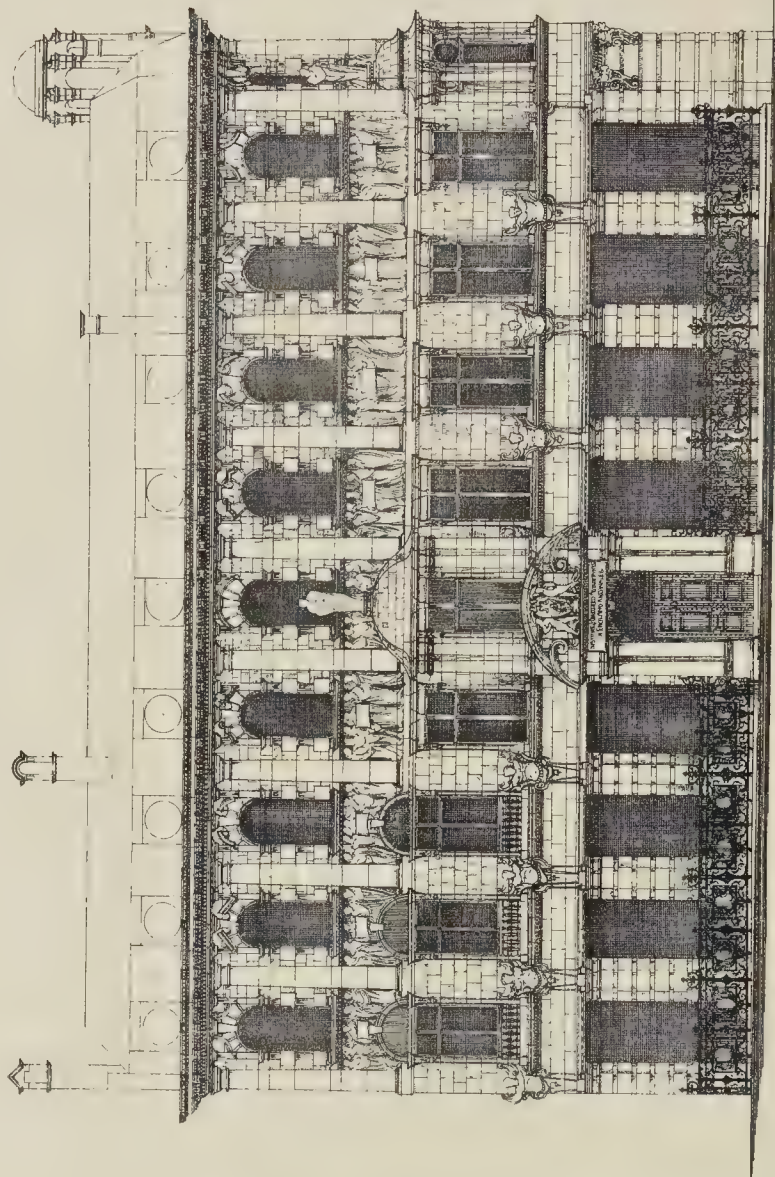
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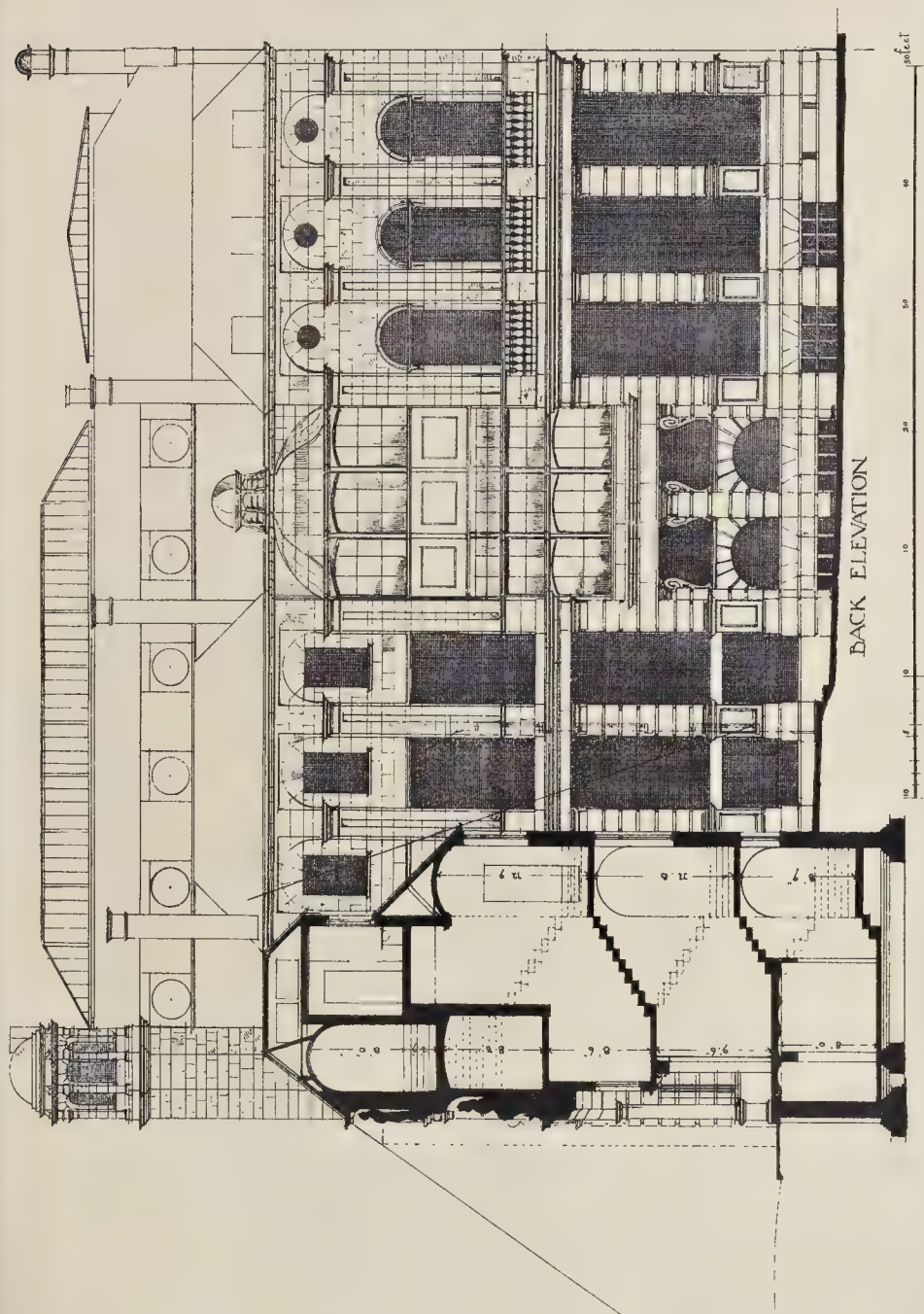


FRONT ELEVATION



NEW BUILDING FOR THE INSTITUTE OF CHARTERED ACCOUNTANTS.—MR. J. BELCHER, F.R.I.B.A., ARCHITECT.  
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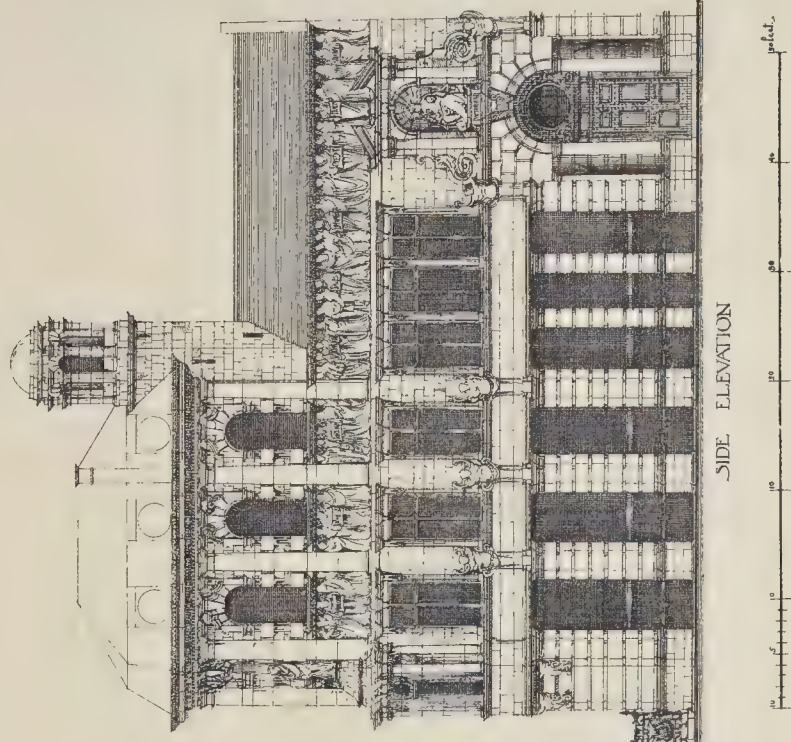
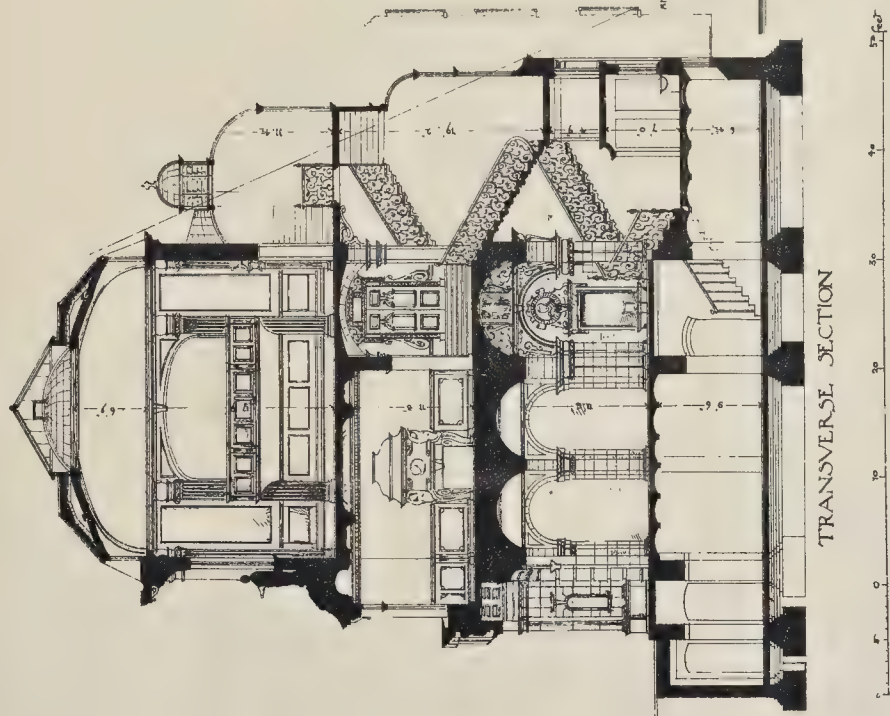




NEW BUILDING FOR THE INSTITUTE OF CHARTERED ACCOUNTANTS.—MR. J. BELCHER, F.R.I.B.A., ARCHT.







NEW BUILDING FOR THE INSTITUTE OF CHARTERED ACCOUNTANTS.—MR. J. BELCHER, F.R.I.B.A., ARCHT.







NEW BUILDING, 26 & 27, COCKSPUR STREET, S.W.—MR. THOMAS BARNES-WILLIAMS, F.R.I.B.A., ARCHITECT.







Plan of Competition Design for Ruthin Grammar School.—By Messrs. T. Lewis Banks and T. Locke Worthington.

at the corner and next to the clerk's offices and strong-room.

The staircase from this floor continues to the hall above, where the retiring-room is placed, so as to serve either staircase, and enable the hall to be let separately when desired.

The main fronts are intended to be Portland stone; white-glazed bricks for areas and lavatories, basement passages, &c. The fireproof construction generally is intended to be that on Messrs. Lindsay & Co.'s principle, including roofs, &c."

#### COMPETITION DESIGN FOR RUTHIN GRAMMAR SCHOOL.

This design for the Ruthin Grammar School, North Wales, was one of the "placed" designs in a recent competition. The architects are Mr. T. Lewis Banks and Mr. T. Locke Worthington, of 23, Queen Anne's-gate, Westminster, S.W.

The proposed buildings include a headmaster's residence, with accommodation for forty boarders, and eighty day scholars; class-rooms, laboratory for instruction in chemistry, swimming-bath, laundry, and the usual accessories of a first-grade school.

The central school entrance gives admission to the ante-hall, to the right and left of which are respectively the dining-room and school-room. Communication with the playground is obtained in the rear by two separate doors, and separate cloak-rooms and lavatories are provided for the day scholars and boarders.

An extra entrance from the quadrangle is provided for the swimming-bath and chemical laboratory; one also to be used by the sick-room, adjoining the isolation staircase.

The headmaster's house is placed at the corner adjoining the main road on the Ruthin side.

The chemistry-room is placed away from the main block, with an isolation corridor.

The bath is accessible from the quadrangle or the main building.

The dormitories are arranged with wide corridors. Two on the right hand of the staircase have cubicles, containing a washstand and dressing-table. A bath-room and night

w.c. are provided for each dormitory. The third dormitory, having no cubicles, has a lavatory provided, and is intended for the younger boys.

The master's rooms are placed so as to supervise the dormitories.

The sick-room, convalescent-room, and nurses' room are situate at the extreme end of the wing. They are isolated by cross ventilation and a closed door. A separate staircase is provided.

The arrangement of the buildings on the site, and the proposed position of the cricket-ground, &c., are shown by a plan in the corner of the view.

T. L. W.

#### MR. STANFORD'S NEW PREMISES, COCKSPUR-STREET.

This building has recently been erected for Mr. Edward Stanford, publisher and map-seller, and Government Agent for the Ordnance Survey.

The materials of the front are chiefly red bricks and terra-cotta, the columns on the ground-floor being monoliths of Cornish granite, with plinths of Peterhead.

The ground-floor is principally occupied by the shop and map-room,—the latter a room 50 ft. long, entirely devoted to the sale of Ordnance and other maps. On the first floor are the counting-houses, geographers' and publishing rooms, and the remaining floors are used in connexion with the various departments of the business.

The shop-front is of mahogany ebouissé, the internal joinery of the shop and the floors of same are executed in wainscot, and the principal staircase in pitch-pine.

There are two hydraulic lifts, one travelling the whole height of the building, and the other to the pavement-level.

The building is heated throughout by hot water, and electric wires are laid to various parts of the premises, as it is proposed to use the electric light in the future.

The architect is Mr. T. Barnes-Williams, and the builders are Messrs. Higgs & Hill. The terra-cotta was supplied by Messrs. Doulton & Co.

#### LONDON STREET ARCHITECTURE AS IT IS, AND AS IT MIGHT BE.\*

It had been my intention to have prepared diagrams to illustrate more clearly some of the matters I am submitting to your consideration this evening, but I subsequently abandoned the idea, believing that it would serve no very good end; for we are so surrounded by instances and by cases, in point that must be well known to all, that simple reference to them will be sufficient when wishing to illustrate any of the remarks requiring it.

In dealing this evening with the subject of my paper, I have ventured to assume that most of you present possess a real and lively interest in the architectural welfare of our great Metropolis, for I cannot conceive a subject which should more keenly interest the members of the London Architectural Association than the condition and welfare of our London streets; nor do I think that the influence of the Association could be better exerted than in actively supporting any movement having the improvement of the appearance of those streets in view. I feel conscious that the subject is a far too important one to be properly dealt with in a single short paper, which I have intentionally made brief because I feel that there may be many in the room whose opinion we would gladly have upon a few suggestions which I shall presently make, and would wish to allow sufficient time for their proper discussion. The subject divides itself into three heads, namely:—1. Is the artistic standard reached by recent buildings generally satisfactory? 2. If not, what are some of the principal causes of the deficiency? 3. The possibility of remedying such deficiency, and the nature of such possible remedies.

First, then, is the artistic standard reached by recent buildings generally satisfactory?

Before proceeding farther it is advisable to more precisely define and localise the term which forms the title of my paper,—London street architecture.

\* A paper by Mr. Francis E. Masey, read before the Architectural Association, on the 4th inst.



A glance at a map shows that for critical purposes the question may be considered from two separate standpoints, the first dealing simply with the heart of the City, and the second including the surrounding and far-reaching area of houses which largely contribute to entitle our city to the flattering prefix of "Great."

The nucleus of the Metropolis, so to speak, contains most of that which to us is historically and architecturally interesting. This central portion may be generally defined as bounded by the New Road and Clerkenwell on the north, the river on the south, Aldgate on the east, and Hyde-park and Westminster on the west and south-west.

Beyond these imaginary boundaries, it is true, a greater London lies, but it is largely the London of stupid stucco, of dull, respectable "brick boxes with slate lids," consisting in the south and eastern portions of acres upon acres of poor, dingy streets and small, squalid, black tenements, which are the homes of the great London poor; and then, farther on still, commences that great suburban world, stretching like a girdle around the grimy city, districts of houses, certainly wonderful if they are not beautiful, and bearing eloquent testimony to the activity, if not to the morality, of the speculative builder. Many of them are almost towns in themselves, and would require a separate paper to do them justice.

The glories of the Queen Anne villas, and of those of Gothic style, the semi-detached species with "venetian blinds and electric bells," as the wily advertisement hath it, and the still smaller, but equally pretentious, "terraces," each bearing imposing names in inverse ratio to the importance of the dwelling; all these have yet to be separately considered, and need not now occupy our attention.

It is the smaller City, which I have already defined, which may now suffice for our consideration, for within its limits falls nearly all that it should be our anxiety to conserve, to improve, and to guard from wanton spoliation. Having thus somewhat focussed our attention, the thing which must strike one most forcibly is the activity in rebuilding which has been steadily increasing during the past few years, and whose spread becomes daily more marked. This activity, there is reason to believe, has by no means reached its climax, and, in fact, there seems every probability that the next twenty years may see central London almost entirely rebuilt.

Before speculating as to what may be done in the future in the way of improvement upon the present condition of things, let us briefly review what has been already done, and see whether the result on the whole may be said to be an improvement upon that whose place it takes.

In considering this question, it is impossible to take a pessimistic view. Let us take only the result of the last ten years, and we shall find, after weighing the good with the bad in the balance, improvements with jobbery, fine buildings and those which are not fine,—I believe, in thus weighing, that the progress will be found to far outbalance the abuses, and that in the standard of artistic excellence there has been a most distinctly forward march.

It is a most regrettable fact, however (as I believe), that the balance thrown into the scale of improvement does not altogether represent a raising of the average standard, but rather points to the great superiority of a comparatively small number of buildings, which are as much above the desired average as the larger number of buildings are beneath that which under proper direction might, I believe, be attained. Let us, then, see what the past ten years has given us.

First in importance should be placed Shaftesbury-avenue and Charing Cross-road, two broad and well-made streets, connecting some of the most important quarters of London, carved through a nest of unsavoury slums.

These undertakings alone are two immense gains to London, considering the difficulties created by defective municipal government, and the obstacles presented by prescriptive and other rights. How much more effectual the improvements might have been made is, perhaps, a matter of easy speculation, and one which may be considered later.

Of almost equal importance are the improvements at the end of Regent-street and at Hyde-park Corner, improvements which those who remember the previous condition of things can well appreciate; besides these there are the

widening of Gray's Inn-lane and many other minor operations.

Then as to buildings, taking public ones first, what city in the world can boast of two finer erections in their way than the Law Courts and the Natural History Museum? Both have been completed within the last decade, which has also seen commenced the Imperial Institute at Kensington and the New Central Police Offices on the Thames Embankment. These are additions to the city of which we may be well proud, and in buildings born of private enterprise we are still richer. To catalogue even the principal ones would be tedious and unnecessary; suffice it to mention a few leading specimens, such as the Alliance Assurance Company's offices in Pall Mall, the Prudential offices in Holborn, Whitehall Court and the National Liberal Club, the Constitutional Club, and the façade of the Victoria Hotel opposite, Messrs. Phillips's premises in Oxford-street, and many others must occur to one.

The mansions of Chelsea and of Harrington and Collingham-gardens, although lying outside our limit, should be mentioned as brilliant exceptions to a very dull general rule.

But although these buildings are in leading thoroughfares, there is, nevertheless, a great deal of honest, faithful work to be seen standing modestly in back or unfrequented streets, and in odd corners where we least expect them.

In dark City lanes, where the narrow roadway remains choked throughout the day with heavy traffic, and where along the still narrower pavement struggle and push scores and hundreds of anxious and busy men,—in many such lanes there rises some solitary specimen of earnest and thoughtful work standing unadmired, and apparently unheeded, except by the valourous connoisseur who takes delight in discovering such specimens, and who for the labour of so doing is richly rewarded.

As an example, there is one little building in Warwick-lane, end of Newgate-street, which is in its way a perfect gem, yet so buried away that, although but a few yards from the main thoroughfare, not one in ten thousand who go daily from west to east, and from east to west, knows, perhaps, of its existence, or would travel one step out of his way to see it if he did.

This I mention as an illustration which occurred to me, and no doubt scores of others might be found.

Besides these must be remembered many fine churches, which are, perhaps, the most hopeful sign of all, though these scarcely can be considered as coming within our present scope.

Besides the recent works of recognised masters there are numerous achievements by a younger school of men now growing up among us, whose work is full of interest and promise for the future.

I have already stated my belief that the recent marked improvement in London architecture points not so much to a real increase of average merit as to the existence of a comparatively small group of men, who, it is probable, would have shed an equal lustre upon any other profession in which they had engaged.

The works of such only make more apparent the feeble mediocrity which characterises the style of too many recent productions.

If one takes an average London house of the last century or early part of the present one, and puts beside it the large majority of those erections which are fast superseding it, the main difference seems to be that the former was, in its dull, monotonous way, negatively beautiful, whilst the latter in many cases is positively ugly.

The unsightliness of this class of building seems to be becoming daily more obtrusive and pernicious.

Side by side with some stately building often may be seen one of the vulgar productions to which I allude, its front sometimes exhibiting such vagaries and absurdities as to draw a smile from the most unarchitectural observer.

One could recall many instances where the effect of a fine building has been hopelessly injured by an ugly and pretentious neighbour. There can be to a London architect few things more exasperating than to see the effect of a piece of work, in producing which he has spent time and thought, almost ruined in this manner.

Of course there is a large class of competent and educated men who occupy an honourable position midway between the "stars," if I may so call them, and the jobbers in brick and stone, against whom I would wage a crusade.

If, however, one may judge from observation, this middle class is being injured by a number of incompetents, who, seeing the professional gate wide open, crowd eagerly in and take the bread from the mouths of qualified practitioners.

I am inclined to believe that until the professional field is more properly fenced and preserved these moral trespassers (for they deserve no less strong a term) will steadily increase, to the detriment of our interests and of our professional reputation. There is scarcely a street now that does not possess one or two buildings of this class, and unless something be done, I believe that matters will not improve.

Having thus endeavoured to draw attention to a state of things which, for the artistic welfare of London, is, I think you will agree, very unsatisfactory, I now venture to suggest a remedy, and propose briefly considering the principal conditions which have helped to influence the development of our modern streets architecture. In doing so, I feel compelled to take that very familiar illustration, Paris, as showing how different the influences have been which have produced such equally different results.

By far the most powerful influence to our detriment is the national indifference to architecture. It is true the architect has suffered only in company with the other arts, from want of public appreciation; but it is, of all the arts, I believe, the one most sensitive to it.

The silver streak, which has given us in the race of nations so many advantages, has had this drawback, that it has interrupted and weakened that art-influence radiating from Italy, of which our Continental neighbours have reaped a fuller advantage. This cannot be more fully seen than in comparing London with Paris or any other large Continental city, where, in the magnificent open spaces, in the arrangement of the public buildings, and in the lofty, straight streets, may be seen the still lingering influence of Imperial Rome. But if Paris be a legitimate descendant of the Eternal City, what reason of her appearing at a disadvantage in comparison with Paris will, with present facilities of communication, soon cease to exist, so that, given sufficient time and with wise laws, a really imperial city is by no means an idle dream.

After this general condition, I place a more particular and equally important one, the atmospheric influences of London. Here, again, we are heavily handicapped in comparison with Paris. Our architect has to reckon with a moist and sooty atmosphere, which goes far to damp his ardour, and to spoil the effects of his labours to produce.

As regards this evil, although the possibility of modifying it has been clearly demonstrated, yet it is, I fear, vain to hope for any legislative action which would materially improve matters. It is not the wisest thing to do to accept this situation, and honestly endeavour to make the best of it, by judicious choice of material?

Next in importance as an affecting influence are the bye-laws regulating buildings, which are at present administered by the Board of Works and its representatives. These regulations are another ingredient in the pill which the London practitioner has to swallow, but it is, perhaps, a wholesome dose.

For those who shelter themselves behind provisions, I would point to Paris, where, in spite of (or, should I say, because of) laws in many ways far more severe than ours there have been produced streets which in architectural grandeur have no rival.

Mr. Francis Hooper's exhaustive and useful paper, read recently before the R.I.B.A., upon the municipal control in Paris, as relating to buildings, enables us to clearly understand the system of administration, and helps to illuminate many defects in our own system.

In conjunction with this matter should be mentioned the laws relating to ancient lights, which the President of the R.I.B.A. rightly calls "unjust and oppressive." This law doubtless is a harassing one, and sometimes seriously interferes with the possibility of obtaining an imposing façade. Still, it need not affect the quality of an architect's work, although it may sometimes restrict its scope.

I have thus endeavoured to trace some of the leading influences upon our street architecture, and now, most personal of all, is the education of the architect himself. This is national, Romantic as opposed to Classical. The same free independence of handling which makes his country-houses the most delightful in the



world also makes his streets comparatively unsuccessful. The continual striving after an independent and striking treatment, which is so praiseworthy in the one case, only produces an inharmonious and disjointed effect in the other. What can be more distressing than a row of recently-erected buildings of high elevation and narrow frontage, where, in spite of conditions framed purposely to secure uniformity, the architect has endeavoured to make his front "entirely his own"? The effect of disjointed cornices, strings, windows, and other features, which, in Classic architecture at least, depend so much for their successful use upon uniformity, is often painful in the extreme; and in this connexion Paris, again, is by comparison decidedly at an advantage.

As to the general style of architecture in Paris,—i.e., the style which predominates,—whether it is altogether beautiful or not is an open question. There are some very fine buildings in that style, and that form of Classic seems well adapted to modern structures.

The idea that they are not pretty or picturesque cannot be discussed. The needs of a great city demand something solid and uniform, and I think that in Paris the best has been done with a difficult problem,—that is, the question of uniformity and order in the streets.

Having now briefly examined the above conditions of development, let us see how far they are capable of being modified so as to produce, if possible, a more successful result.

Now, as regards the first reason, its existence has been quite lately proclaimed, and the indictment proved with logic and eloquence by Sir Frederic Leighton himself, to whose now celebrated speech I need hardly allude. But if we have to wait until the public taste has sufficiently improved to bring an influence to bear in raising the standard of our national architecture, we shall have to wait a very long while.

We must not hope for, or trust to, any support from the public. The larger number do not, I honestly believe, even know what an architect is! I have often been asked to define his profession and work, by people who would certainly consider themselves, as the term goes, "highly educated." Why, quite lately, to my knowledge, the principal of a large college in the neighbourhood of London wrote to its architect, who is a man of high reputation, asking him to undertake some small plumbing repairs, being evidently under the impression that it was part of his duties to perform the useful work in question! This is one instance of ignorance out of scores that might be named. A public which uses the word "artist" simply as a synonymous word for painter,—a public which has looked on with indifference whilst one of our most precious Abbeys has been ruthlessly mutilated,—which has been twenty-five years making up its mind to renew the Regent-street lamp-posts,—which planted the Temple-bar Memorial opposite Street's Law Courts, and in one of the narrowest parts of a crowded thoroughfare, and which now calmly contemplates removing the Church of St. Mary-le-Strand for exactly opposite reasons,—which has suffered the Burlington House Arcade to moulder neglected by the Thames at Battersea,—which has allowed Temple-bar to be removed from London to the park of a private individual, almost without protest,—what can we expect from it?

It is the same public which rushed in its thousands to see Tom Thumb, whilst poor Haydon's pictures remained in the same building unvisited.

Still, I firmly believe that good taste is growing, though slowly, but it will never do for us to wait for it.

Nor do I think there is any reason to suppose that, even in the palmiest days of English art, there ever existed a discriminating or cultivated popular taste such as has been dreamed of by socialistic and artistic reformers.

I believe that the culture must come from the architects themselves, and that the real way for us younger men to help to regain for our profession its proud position as head of all the kindred arts, is by resolutely closing up our ranks against impostors, and by raising the standard of education amongst ourselves.

But before enlarging upon this matter, let us pass to atmospheric influence. That this does largely, and must always to a certain extent, handicap the architect, may be taken as certain. But does he always honestly try to meet it? In order to grapple successfully we have had placed in our hands two splendid materials, terra-cotta and tile, in the successful use of

which there is an almost unlimited field for happy display in design and in colour. It is true we have almost passed the reign of stucco, but we are still under the sway of delicately-tinted and carved Mansfield stone, and equally perishable Bath. That an architect should continue to use these most inappropriate of materials, when he has such greatly superior ones at his hand, is to me a mystery.

The masterly use of terra-cotta by Mr. A. Waterhouse, Messrs. George and Peto, and Mr. Colcutt, must by now have dissipated all objections to its use, both artistic and practical; and for London, I firmly believe that it is the material of the future. The operation of the laws of prescriptive rights, I have already said, need not be considered in the restricted scope of this paper.

Neither, for the same reason, do I propose to consider the operation of the Metropolitan Buildings Act. The Board which administers it is soon coming to an end, and a new régime is to take its place. Since the delinquencies of subordinate officials,—recently investigated,—it has become fashionable to criticise the expiring Board and its acts, but I do think it should be remembered how substantial and practical the improvements effected by the Board have been, and in the face of how many difficulties they have been accomplished. The public indifference,—almost hostility,—the complication of prescriptive and other rights, and the representative nature of the Board, have all to be taken into consideration as serious obstacles, which have on the whole been fairly successfully overcome. It must be remembered that any discredit attached to the Board must necessarily reflect on the ratepayers, as its constitution is strictly representative. Whether the Council, which will take its place, will do better remains to be seen. Out of its prospective constitution there already peeps the cloven hoof of political party. If this element should predominate, all hope of a better state of things may be at once abandoned. I confess that I believe the more "popular" that body is, the less chance there is of any improvement taking place. It is rather from the large owners of house property in London, with autocratic powers, such as the present Duke of Westminster, that any great structural improvements are to be hoped for. It does not seem to be sufficiently recognised, when a new building is projected, that there are other rights to be considered besides the purely selfish ones of the owner of the property. I maintain that the public has a certain and clear right to stipulate that the building to be erected, if not to be an ornament, shall at any rate not be a disfigurement to the neighbourhood in which it stands, and I believe the violation of the principle is becoming daily more marked, and if the most interesting parts of the city are to be saved from hopeless disfigurement, preventive steps ought to be taken at once.

To effect this, I contend that there should be an official, or officials, whose sanction of the architectural character of the elevation of any proposed erection it should be necessary to obtain, just as a similar test is at present applied to ensure their constructive efficiency.

The standard of merit aimed at need not at first be high, and the labours of such an official, were he an architect of standing, would not, I think, prevent him pursuing his own work. For in most of the cases I can think of, the ugliness almost entirely lies in pure excrescences, which judiciously pruned off, the building would, at any rate, pass muster as comparatively harmless.

The examining official might be a fellow of the R.I.B.A., and should be appointed to act in connexion with each district surveyor.

In cases of dispute there could be an Appeal Court, consisting of the President of the R.A., the President of the R.I.B.A., and one other architect, perhaps also an Academician.

This suggestion may be crude in its details, but I believe that the necessity of some control over our street architecture is becoming rapidly recognised.

Should the R.I.B.A. take the initiative in the matter, I feel sure that the A.A. would closely and loyally support that body, remembering their responsibilities as trustees for posterity, and as dutiful citizens. Now for the last grievance on my list of grumbles,—the incompetent practitioner. I believe the only way to keep him out of our midst is by raising our own professional standard. At the present time it is distressing to see many able men who have gone through a right laborious and expensive

architectural education doing next to nothing, whilst the quondam builders' clerks, or other happy irresponsibles run up houses and shops, warehouses and mansions, perhaps through being the lucky possessors of influential relatives in the City, or a successful auctioneering brother in the West-end. Whilst this anomaly exists, it must considerably discourage culture for its own sake; and exist I believe it will until the incompetent element is kept out. That any system of mere registration will remove this mischief I do not conceive. The first step must be higher education of the younger members, combined by-and-by with a compulsory test examination. We have already taken one important step towards an improvement in the R.I.B.A. Associate Examinations. The constantly-increasing attendance at them is a happy augury for the future, and every man who possesses sufficient knowledge, and who has the courage to face the tests, ought, I think, to lose no time in submitting himself to them.

In his recent address at Liverpool, Sir F. Leighton's text, as remedy for existing evils, was education. In his address to the Royal Institute of British Architects the distinguished President said what we wanted was education, and our own good President, in his opening lecture, preached very much from the same text.

The education of the younger members is the particular province and privilege of the Architectural Association, and it is by encouraging it by every means in their power that members will indirectly but most surely be able to influence and improve the future standard of London street architecture.

[A report of the discussion is held over for want of space.]

#### ARCHITECTURAL SOCIETIES.

*The Architectural Association.*—The sixth meeting of this Association for the present session was held on Friday, the 4th inst., in the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair. Mr. T. E. Pryce (Hon. Sec.) announced the arrangements for the Cates Prize, which will be open to any member of the Association. The successful candidate will be required to visit Paris during the forthcoming Exhibition, which he will have to study and report upon. The conditions are embodied in rules which are to be sent to all members of the Association. The Chairman stated that the agreement for the affiliation of the Birmingham Association had now been formally settled, and in order to meet Mr. Leverton's views, it was proposed that the agreement should be exhibited in the reading-room, and that the rules should be considered at the next Ordinary Meeting of the Association. Mr. Francis Masey then read a paper entitled, "London Street Architecture, as it is, and as it might be," which we print on another page. A report of the discussion is in type, but is unavoidably held over until next week.

*Leeds and Yorkshire Architectural Society.*—"Art Metal Work" was the subject of a lecture delivered on Monday evening to the members of the Leeds and Yorkshire Architectural Society by Mr. J. Starkie Gardner, of London. The President of the Society (Mr. Henry Perkin) was in the chair.

The lecturer at the antiquarian part of the subject, comparing the conditions under which the Roman and Greek iron work was produced from rough blocks in shape and size with those of the present day. In the Middle Ages the smith began to beat out these blocks under tilt hammers by water-power, thereby saving himself very considerable labour. Somewhere about the time of Elizabeth rolling and sitting mills were established, and iron was put on the market in the form of sheets and nailrod, and thus the smith's labour was still further lessened. In contrasting modern work with old, it was necessary that the conditions under which they were produced should be borne in mind. Much modern work, he pointed out, was not hammered at all, but was supplied almost as it came from the mills, and thus it lacked that diversity which constituted the special charm of manual work. Smithing was a fine art, and theoretically the smith ought to make his designs as well as execute the work. He (the lecturer) had sought to encourage workmen to make designs; whenever a man had shown any promise he had left him as much as possible to work out his design. The result had



been some very pretty filigree-looking work, but nothing that was of much use, and he did not think the time would come when the smith could be left to make his own designs. That, in his opinion, would always be the work of the architect, or of someone he might delegate. Designers were required with a thorough ground-work in all the particular styles of art in use, and not in one style, which might be considered the best, but which was not in use. The designer who understood the craft for which he designed would be able to save often quite half the cost, and the client would not see the smallest difference. A vote of thanks was accorded to the lecturer at the close.

**Manchester Architectural Association.**—The fifth ordinary meeting of this Association for the present session was held on Tuesday last. Previous to the business of the meeting, the following resolution, moved by the President (Mr. A. H. Davies Colley, A.R.I.B.A.) and seconded by Mr. J. D. Mould, A.R.I.B.A., Hon. Secretary, was carried unanimously, viz.: "That this Association heartily congratulates Mr. Henry Ernest Stelfox, A.R.I.B.A. (one of the officers) on his success in winning the Aspitel prize, given to the candidate who obtains the highest number of marks in the Examination in Architecture of the Royal Institute of British Architects, out of the total number of candidates from the whole of the United Kingdom and Colonies in one year." A paper was then read by Mr. F. Bennett Smith entitled: "A Visit to the Buttermere Slate Quarries," in the course of which he said:—The Buttermere Slate Quarries, which are worked by a company, with Mr. B. Johns as secretary, are situated in Honister and Yew Craggs, on either side of the pass descending into Buttermere. The superiority of the green slates obtained in these quarries is due to the fineness of the metal, and the facility with which it can be worked. There are twelve levels or tunnels in all, which give employment to about 100 men. The highest level is 1,190 ft. above the level of the foot of the Craggs, and 2,128 above sea-level. Great extensions have been made within the last few years. And it is now estimated that 3,000 tons of slate are sent into the market annually. Preparations are now being made by which the slate-metal can be cut into blocks made useful for building purposes, instead of stone. It is easy to work, it will stand an enormous strain, greater than many building stones, and its colour is certainly advantageous and preferable to many stones. The slates, which are well known, have been used in all parts of Great Britain and Ireland for the roofs of many of our most important public and private buildings. A vote of thanks to Mr. Smith for his interesting paper was carried unanimously.

#### OBITUARY.

**Mr. J. O. Halliwell-Phillips, F.R.S., F.S.A.**—We regret to have to announce the death of this well-known antiquary and Shakspearian commentator, which occurred on the 3rd inst. Mr. Halliwell-Phillips was in his sixty-ninth year.

**Mr. E. N. Clifton, F.R.I.B.A.**—We bear with regret of the death of Mr. Edward Norton Clifton, the well-known architect and surveyor, which took place on the 8th inst., at his residence, 113, Harley-street. Mr. Clifton was in his seventy-second year. He was elected a Fellow of the Institute of Architects in 1880, and a Fellow of the Surveyors' Institution in 1868. We are asked to mention that the funeral will take place this Saturday, the 12th inst., at Finchley Cemetery, at 1.30. A service will be held previously at St. James's Church, Westmoreland-street, Marylebone, at 12 o'clock.

**Mr. William Hill, F.R.I.B.A.**—The *Leeds Mercury* of Tuesday last says,—"We regret to notice the death of Mr. William Hill, Fellow of the Royal Institute of British Architects, who during the past thirty-seven years has held a leading position amongst the architects of this town. He was educated at the West Riding Proprietary School, Wakefield, and after leaving school he was articled to Messrs. Perkin & Backhouse, architects. He commenced practice in Leeds in 1851, since which time he has carried out several important works—viz., Bolton Town Hall, Yeasdon Town Hall; Public Hall and Mechanics' Institute, Barnsley; Leeds Dispensary, Leeds Poor-Law Offices, Holbeck Workhouse, Hunslet Workhouse and Schools, Rotherham Market, Rannoor College, Sheffield; Firths Almshouses, Sheffield; mansions at

Rannoor and in the neighbourhood of Leeds, several corn exchanges, upwards of 100 chapels and schools in different parts of England (including the Methodist New Connexion Chapel in Woodhouse-lane, Leeds), and many other works of a similar character. At the time of his death he was engaged upon the erection of the new Town Hall at Portsmouth, estimated to cost upwards of 100,000*l.* He died at his residence, The Heath, Adel, on Saturday morning, aged sixty-one years.—Last evening, on the occasion of a lecture delivered before the members of the Leeds and Yorkshire Architectural Society, the President (Mr. Henry Perkin) referred to the death of Mr. Hill, who was an esteemed member of the institution. The deceased gentleman, he said, was also a Fellow of the R.I.B.A., and the oldest practising member of the profession, he believed, in Leeds. Mr. Hill was the first pupil articled to his (the President's) late father and his partner, Mr. Backhouse. He had been some time in practice before he made his mark, but he eventually acquired a very large connexion, and erected many public buildings. The Town Hall of Portsmouth, now in course of erection, was designed by him, and it was to be hoped that that work would be brought to a successful termination by his son, who had been in partnership with him. They would all deeply sympathise with Mrs. Hill and the other members of the family. He moved that a vote of condolence be forwarded to them, and he should be glad if members of the society would join him in attending the funeral of the deceased on Wednesday afternoon.—It was agreed that the vote of condolence should be sent, Mr. Danby seconding the motion."

**Mr. James Gordon.**—We regret to hear of the death of Mr. James Gordon, architect, who for two years past has been in partnership with Mr. Hippolyte J. Blanc, George-street, Edinburgh. His death was the result of a chill caught on Christmas Day, and he died at Mr. Blanc's house on the 4th inst. The *Scotsman* says:—"Mr. Gordon, who, it appears, was just on the eve of being married, was one of the most promising architects in the city. His death will be heard of with unfeigned regret by all members of the profession, not only in Edinburgh but in Scotland; for Mr. Gordon, though only about thirty-four years of age, was fast rising to a foremost place among architects of the day, and was believed to have a splendid future before him. He served his apprenticeship under Dr. Rowand Anderson, whom he afterwards assisted in many important works—notably the new University Buildings. About eight or ten years ago he received an appointment in Mr. Blanc's office, and about two years ago was taken into partnership." The funeral took place on Saturday last. At half-past one o'clock a large company assembled at the residence of Mr. Blanc, where funeral services were conducted in the dining and drawing rooms by the Rev. Mr. Imrie, the deceased's pastor; the Rev. Dr. MacGregor, St. Cuthbert's; and the Rev. Mr. Webster, Cramond Parish Church. Shortly after two o'clock the funeral procession, consisting of the funeral car and upwards of twenty carriages, started on its way to the place of burial at Warriston Cemetery. The pall-bearers were Mr. Gordon, brother of the deceased; Mr. W. Gordon, uncle; Mr. Blanc, Messrs. Grant, Mortimer, Young, Watt, and W. Gordon, cousin.

#### COMPETITIONS.

**The New Pier, Dover.**—Mr. J. Wolfe Barry, M.Inst.C.E., has been appointed to act as assessor of the designs which have been invited for the new pier, with pavilion, at Dover. A company propose to construct a pier, 300 yards long, in Dover Bay. Premiums of 100*l.*, 50*l.*, and 25*l.* will be given for the best three sets of plans.

**Board Schools, Carlisle.**—Designs were recently invited for a new set of schools about to be erected on a site in Ashley-street, Caldewgate. It was unanimously decided, at a meeting of the School Board held on Wednesday afternoon, to adopt these under motto "Sweetness, Comfort, and Light," the author being Mr. T. Taylor Scott, of Carlisle; Mr. Geo. Dale Oliver, of the same city, receiving the second premium.

**An Art Exhibition in Rome.**—Roman journals announce that an art exhibition will be opened in that city in February next, comprising ceramic, glass, and similar kinds of objects d'art.

#### TEMPORARY BUILDINGS.

At the Clerkenwell Police-court, on the 4th inst., the following cases came before Mr. Horace Smith:—

**District Surveyor of South Islington v. Bishop and Marsden.**—This summons was taken out under Section 13 of the Metropolitan Amendment Act of 1882 for erecting a building of a temporary character without first obtaining a licence from the Metropolitan Board. Mr. H. Lovegrove showed that he had given the defendants ample time and notice to alter the building so as to make it regular, or to obtain the licence, and the magistrate decided in his favour, inflicting a nominal fine and costs.

The same District Surveyor summoned Mr. Andra for making additions to a building, and Mr. Baddeley for erecting a cart-shed, in both cases without giving notice, and the magistrate imposed a small fine and costs.

#### THE ABBEY OF ST. ANDREW, HEXHAM.

SIR,—I am sensible of the great honour done me by the appearance of so lengthy and so learned a review of my monograph on Hexham Abbey, in your issue of December 29, 1888. While thanking you for this honour, I would ask permission to make one or two comments on the article in question, trusting that you will understand me when I say that I do not ask this favour in any spirit of criticism, but because I am sensible of the fact that, however careful a reviewer may be, in such cases as this want of local knowledge often causes errors to creep in unobserved, which it would be unfair to your readers for me to pass altogether unnoticed.

P. 461, third column. The two chambers (not "one") in the crypt with triangular roofs or vaults, are scarcely passages, but chambers at the ends of the passages; evidently for the purpose of relieving the pressure of a crowd in these passages. Views of one of them are given on plate 39A.

P. 462, first column. Prior Richard of Hexham was no monk, but a Regular Canon of the order of St. Augustine, to which order Hexham Priory belonged. It is only called an abbey by custom and by tradition, as there can be little doubt that St. Wilfrid's foundation was for Benedictine monks. The church in its Mediaeval life was that of an Austin Canons priory.

Brixworth Church is about 156 ft. in length, taking the outside measurements of the first building. There is not a fragment of Norman work about the abbey. The reasons for this are fully explained in chapter iii. The two small cushion capitals were found on the site of St. Mary's Church, and were carried into the abbey church by me in order that they might be preserved.

P. 462, second column, and first paragraph, p. 463. The story of the east end is a curious one, and at the same time a most pitiable one. There have been five east windows since the choir was built, c. 1180. The first would be a series of lancets, judging by the lines of similar churches in the Border country. A "Perpendicular" window followed, probably c. 1425. This is shown in the "Monasticon" view of 1661, and in Buck's view, dated July, 1728. Between 1728 and 1815 this window was replaced with one of bastard Gothic character, as shown on the interior view on plate 7. I am in error in ascribing this window to the repairs of 1725-6, as stated on p. 49; it must have been inserted after Buck's drawing was made. This third window was replaced in 1828 by a copy of it, somewhat altered, under Mr. Dobson. The present east wall was erected under Mr. Dobson, 1858-60. It cannot be said to have been designed by him, however, as the whole composition is merely a parody on the east end of Whitby Abbey. Mr. Dobson's treatment of the east end of the church was unfortunate and mistaken. His great ability, which amounted almost to genius, as a designer, and as the architect of large public buildings, is generally admitted, but of Mediaeval architecture he cannot have known but little, and cared much less, on the destructions at Hexham would not have occurred. His extensive practice probably prevented his giving sufficient attention to the alterations of churches under his care. We can only look back and deplore the ravaging of the rich stores of Mediaeval art, once to be seen at Hexham, and regret the concatenation of circumstances which precipitated the work and prevented its postponement for another quarter



of a century. The range of eastern chapels, though originally but poorly built, could easily have been repaired, had the work been done in time. The photograph on plate 7 was taken after they had been uncovered seventeen years, by the removal of the modern cottages built against and into the chapels. This long exposure without any repair whatever hastened their decay, and their dilapidated appearance, coupled with Mr. Dobson's desire to remove his ugly east window, sealed their doom. The loss is a terrible one, both from an æsthetic and a utilitarian point of view. Their outline and character gave to the exterior view of the church that complicated and varied appearance which is one of the chief charms of our monastic and cathedral churches. Internally they served to lengthen the perspective of the choir; as a view of the east windows of the chapels was obtained through the arches, which had been pierced through the lower portion of the east wall, and the chief defect of the choir (its shortness) was in some measure compensated for. This arrangement of chapels placed Hexham on the same list as St. Mary Overy, Christchurch, Abbey, Dore, Ramsey, and other churches. From such good company it has been rudely snatched by being robbed of its only later structural addition, and of the nine traceried windows of which it could boast in 1858 not one remains. The mutilation is felt most keenly to-day, as the church is much too small for the congregation, or for any decent ritual arrangements at the east end. The whole congregation is crammed into the choir and its aisles. There is no possible means of adding to this space, short of pulling down the walls or shifting the rood-screen. The eastern chapels gave an additional length of 25 ft. to the church, which space could easily have been utilised for the altar and its surroundings. These now take up one bay of the choir. Thus, accommodation for at least 100 persons has been lost, and no gain of any kind whatsoever can be set off against the loss.

Any monograph on Hexham Abbey would have been notoriously imperfect did it omit delineations of these eastern chapels, and show in as complete a manner as possible all the medieval ritual arrangements of the choir. I, therefore, chose to show the church as it was in 1858, rather than as it is in 1888. My friend, Mr. R. J. Johnson, of Newcastle, had, most fortunately, made drawings of Hexham Abbey, including the eastern chapels, before the former year. The whole of these he most generously placed at my disposal, along with Mr. Dobson's drawings made for the alterations. These latter I have used in drawing plate 37.

The course I chose to adopt added very greatly to my labours but also to the value of the book, as the eastern chapels are now rescued from the oblivion to which Mr. Dobson thought he had consigned them, and his own bad work and sinister motives are placed on record. I do not think the present east end worth a plate, as in these days of photographs any one can obtain a representation of it for a trifle, and I could no more bring myself to measure it than I could Wyatt's additions to the nave at Hereford, or the hideous erection that now closes in one end of the nave at St. Albans Abbey.

CHARLES C. HODGES.

Sels House, Hexham,  
January 3, 1889.

#### AN ORGANIST ON THE PLACING OF CHURCH ORGANS.

SIR.—Apropos of Mr. Belcher's excellent paper at the recent meeting of the R.I.B.A., will you kindly afford space for a few remarks from an organist? Although I believe that it is the intense craving for impossible architectural uniformity which has led to the destruction of the majority of the few noble examples of English case-work left to us by the Rebellion, or erected shortly after it, yet I venture to ask, whether in the too-frequent event of compulsory economy in the erection or restoration of a church and organ, the architect might not adopt a *via media* between the rigid insistence upon some pet hobby or expensive design, and the despairing abandonment of the case to the organ-builder,—sometimes an artist, sometimes only a joiner? It is incredible to me that any church should sanction the hideous four-post monstrosities affected by one or two noted organ firms. May I ask whether architects are, as a body, aware of the great facilities in designing afforded by the recent

light-wind with small tubes)? By its aid pipes perfecting of the pneumatic tubular action (on can be grouped and displayed in a manner impossible with tracker-action and conveyancing tubes, to say nothing of the enormous advantage of detaching the console so that the performer can hear the full effect of his playing, can face in any direction, can hear his choir even better than if sitting beneath a bracketed organ, and can be placed in such a position as to communicate with the clergy and singers, to the avoidance of many awkward "hitches." It is truly delightful to hear so many eminent architects condemning the organ-chamber, that arch enemy of purity, power, and permanence in organ tone; but in cases of a chamber being an absolute necessity, I feel convinced, as the designer or restorer of many important instruments, that one point of egress of sound is infinitely preferable to the conventional two, especially when they are blocked in by case and pipes in the usual manner, and several experiments have assured me of the truth of this. There can be little doubt that organs contained in a west-end tower produce a fine effect, but in these cases there is, as I have advanced, but one egression of sound. Moreover, the roof of the chamber is generally high-pitched, never sloping the wrong way, as in the case of the lean-to order of chancel chamber, whilst the height from the floor adds to the general effect by permitting the sound-waves to re-sort themselves along the roof before reaching the ears of those below. This position is, however, rendered almost impracticable by the revival of early English ritual, unless the west-end organ be assisted by one placed near the choirists. It is impossible for an organist seated at the west end of the church to satisfactorily accompany an east-end choir and an intermediate congregation, though an organist seated at the east end could control the choir, and consequently the congregation. In spite of the supposed objection from a ritualistic point of view, I do not think it would be difficult to persuade the clergy of the advantages of an organ bracketed over the altar (in the absence of an east window); the case and pipes, if artistically treated, would form an exquisite decoration, and if this position,—and that of Ratisbon Cathedral amongst others,—were adopted, decorated shutters, to be seen with so many Spanish organs, would, when opened, present the appearance of the two wings of a Triptych. The whole question is one of expense. In a large church there can be little doubt that a powerful organ at the west end, combined with an ample accompaniment organ at the east (divided on screen or as *reredos*), and both controlled by a performer seated immediately behind precentor and choir, would solve most of the ritual and acoustic difficulties we have to face. May I say that from experience I am assured that the rood-loft position is of great advantage to organ tone, but that the organ should not interpose betwixt choir and congregation; that *organ tone is now entirely independent of distance between key and pipe*,\* and that a properly-constructed hydraulic engine makes no noise whatever if provided with an automatic governor, costing only a shilling or two. I venture to think that it is not so much the large churches and cathedral organs that require consideration, but the smaller buildings, where space and means are comparatively limited. As a case in point, an architect of some reputation allowed me for an organ the following approximate measurements:—Chancel aisle, length east to west about 30 ft., depth N. to S. about 10 ft.; height, 8 ft., rising to 12 ft. or 14 ft. The only places for egress of sound were three narrow slits, and there was no provision whatever for the performer, even if any organ could have been got into the space (?) provided. As a natural result, there were extensive structural alterations.

The organ question must be one of great difficulty to an architect; yet the instrument is one which, apart from artistic considerations, is all-important from a commercial point of view, because the organ has an undoubted influence upon the offertory. I submit, therefore, that the requirements of the organ should have greater and earlier consideration from architects of small or moderate-sized churches,—that it should never be placed in a chamber, unless as a separate instrument at the west end; that ample room should be afforded, not only for the collective tone, but also for the

\* This we have already pointed out; the italics are our own.—ED.

speaking of individual pipes; that the console should be detached from the organ whenever possible,—the player being seated close to the clergy and choirists, and that, if not, the organist should be partially under the pipes, so as to hear his choir; as also that, whilst the organist or the builder should have full control over the "lay-out" of the instrument, the scheme should be submitted to the architect, who would be responsible for the case and general appearance. With many apologies for trespassing at this length upon your valuable space,

ERNEST LAKE.

All SS. and St. Columba Churches,  
Notting Hill, Jan. 3, 1889.

#### LICHFIELD CATHEDRAL.

SIR,—A friend has sent me a copy of the *Builder* of this day's date, calling my attention to the really artistic sketch of Lichfield Cathedral contained in it, and also to some remarks in the notice which explains that sketch.

You say that "in the re-restoration in stone,"—which is not "proceeding," but is actually finished,—of the west front, "so far as we can understand, no architect has been employed." The writer of this remark can have been at very little pains to inquire, for any one connected with the cathedral could have told him that some twenty-five years ago careful photographs were taken, under the close direction of Sir Gilbert Scott, of the only portion remaining of the original work, much decayed indeed, but still to be traced, on the east side of the north-west tower; that these photographs served as the guide and the *motif* of the entire west front renewal; that the drawings for the whole were prepared by Sir Gilbert Scott; and that, after his death, his son, Mr. John Oldrid Scott, furnished a clerk of the works, and superintended the whole enterprise from first to last.

If you doubt the correctness of my statement, I can only say I have been connected with the cathedral for more than thirty years, and know very well what I am writing about.

Further, you state that "apparently the new figures have been placed, in most cases, with but little regard to any comprehensive system." In answer to this, I may say that, except so far as the position of the Saxon and Norman kings, which run across the front, goes, we were absolutely without any guide as to the scheme, order, or design which the other figures no doubt once represented, or what persons those figures represented. But we elaborated a scheme with no little care to the best of our power. That scheme has a purpose and an intention, too long and too minute to state here; and, with one or two exceptions, arising out of circumstances which occurred as the work went on, it was faithfully adhered to, and tells its own story to those who will be at the pains to study it.—Yours faithfully, JOHN G. LONSDALE, Canon Residentiary, Lichfield Cathedral.

The Close, Lichfield, Jan. 5, 1889.

\* \* Mr. Oldrid Scott has also written to us, expressing very natural surprise at the fact of our ignoring him. The remarks alluded to were not written by the artist who visited Lichfield to make the drawing. Our impression that no architect had been employed was mainly due, in the first instance, to Canon Lonsdale himself. The last time the present Editor of this Journal visited Lichfield, he was taken over the cathedral by Canon Lonsdale, who spoke of the whole work as if it were being carried out under his own direction, compared it with what his relative, Lord Grimthorpe, was doing at St. Albans, and never mentioned or alluded to any architect in any way. A published "Guide to the Cathedral and the New Sculpture," which we have since seen, and which is dedicated "by permission" to the Dean of Lichfield, and apparently published with the sanction, at least, of the clerical authorities, gives an account of all that has been done, entirely ignoring the names of either Sir Gilbert Scott or Mr. J. G. Scott, and giving the whole credit of the treatment of the front to the Dean. If the clergy and others in connexion with a cathedral choose to ignore their architect altogether in speech and in print, and give him no credit for his advice and assistance, it is not surprising that the unsuspicious visitor should imagine that they mean to take all the credit themselves. We are glad to find that it is not so.

#### ST. JULIEN LE PAUVRE, PARIS.

SIR.—Hearing through your columns that the magnificent Transitional Church of St. Julien le Pauvre is to be cleared away to form a new street (and possibly to share the fate of other buildings in forming the macadam for it), it has occurred to me that it might be bought wholesale and re-built, stone for stone, either for the use of the English in Paris or elsewhere, or as a private chapel for some wealthy man. It is such a pure and lovely example,



that to let it perish or be secularised for want of interest would be little less than a deliberate sin. I spent many hours in getting leave to see, finding it, and enjoying it when found, but even then (in the summer of 1886) my guide grew angry because I refused to keep my hat on!

The late Sir Gilbert Scott said of it:—"The choir and its aisles form a perfect work on a very small scale in the Transitional style, with Byzantineque foliage."

E. SWINFEN HARRIS, F.R.I.B.A.

#### CHURCH-BUILDING NEWS.

**Crawley Down (Sussex).**—The church at Crawley Down, Sussex, has been enlarged by the addition of a south aisle, and the south porch has been rebuilt. Mr. A. J. Style was the architect, and Mr. Peters, of Horsham, was the builder.

**Effingham.**—The parish church of St. Lawrence, Effingham, Surrey, was re-opened on the 20th ult., after restoration. According to the local papers, the church had for several generations been allowed to continue in a very unsatisfactory state. The chancel has been partially rebuilt and restored by the execution of the following work:—The walls that were unsound have been taken down and increased in height, and a large three-light window inserted therein. At the east gable a new parapet-wall has been built up and coped with Bath stone, having a carved cross at the apex. The roof has been raised about 3 ft., and in so doing traces of decoration were discovered on the walls, but the colours were too far gone for the subject to be ascertained. The old oak rafters have been restored and lined with oak boarding formed into panels, being moulded with shields, with intersections left for future enrichment. The floor has been paved with Minton's tiles, with stone steps rising from the nave to the altar. The reredos is entirely new, and consists of a canopied arcading in Caen stone, very elaborately carved and panelled, the tracery being richly gilt in relief. Under the canopy is a central full-length figure of Our Lord, supported on either side by the four Marys, all these figures being sculptured in alabaster. The reredos and surroundings have been executed at the cost of the late Mr. J. M. Teesdale, of the Lodge, Effingham. The new chancel arch was the gift of Colonel Bayly. The whole of the nave has been rebuilt, and the tower is new. It is constructed with Bath stone, and faced with flint work. It is in the Perpendicular style, and has an embattled parapet, large west window, and arch opening into the nave. The south aisle is an addition to the chancel, and consists of a lean-to erection, the old south wall having been taken down and rebuilt in four handsome arches, supported by circular columns of Forest of Dean stone, having caps and bases of moulded Bath stone. An old "stoup" discovered in the wall of the nave has been replaced. The vestry and organ-chamber is new, and constructed in the same style as the other portions of the church. The vestry has been erected at the cost of Mr. W. Trotter, in memory of the late Rev. Mr. Malthus, for many years vicar. The transept is by far the most ancient part of the church, and is of unusually large proportions for so small a church. The south-end contains the chapel of St. Nicholas, and is built in the Early English style, with two lancet-headed windows on the south and west side. In clearing off the plaster a piscina was discovered in the south wall near the altar. This has been slightly repaired, and remains in its original position. The whole of the body of the church is seated with massive English oak benches. All the tablets, memorial-brasses, old tiles, &c., have been refixed on the wall of the tower. The memorial slab (originally in the pavement of the chancel) to the memory of Walter de Goddinges, has been retained near the chancel arch. The tower has been erected by the late Mr. J. M. Teesdale, in memory of his late uncle, the Rev. H. Robinson. The whole of the work has been carried out from the drawings and under the superintendence of Mr. W. J. Shearburn, architect, Dorking, by Messrs. Patney Bros., builders, of the same town.

**Gloucester.**—The new reredos for St. Mary de Crypt parish church, Gloucester, will shortly be placed in position, and it is hoped will be completed by Thursday, Jan. 31, on which day the Bishop of Manchester (Dr. Moorhouse) has promised to preach. The reredos, which is of stone, has been designed by Mr. F. S. Waller,

architect, Gloucester, and executed by Mr. Frith, of that city. The three central panels of coloured mosaics have been designed by Mr. N. H. J. Westlake, and executed by Messrs. Salvati & Co., at Venice.

**Kilmington.**—The tower and belfry of Kilmington Church, which has been under restoration for the past five months, was recently re-opened by the Bishop of Colchester, acting for the Bishop of St. Albans, who was prevented by ill-health from attending. According to the *Herts Mercury*, the work has consisted of a thorough restoration of the tower, externally and internally, and the foundations, where necessary, have been laid in cement. Almost all the external stone-work of the door and windows, mouldings, and string-courses have been replaced, the stone used being the Beer-stone from Devonshire. The battlements have been almost entirely rebuilt; the plaster which had been placed over the ancient rubble work has been taken off, and the flint left bare and pointed where necessary. The south buttress has been entirely rebuilt. Internally, the cracks from settlements have been filled up with liquid cement, and the weak places strengthened by the insertion of Yorkshire bonders, and the staircase has been fitted with new steps where needed. Several ancient windows have been opened out, and the tower-floor cleaned and the walls discoloured. The tower is a very good specimen of plain work, such as was done in the early part of the fifteenth century, built in flint and Totternhoe stone, and in the restoration the ancient features have been most carefully preserved, and where possible the old stone work has been retained. The belfry has also undergone complete repair. The woodwork has been in part renewed, and the stocks and ironwork of the bell-hangings refitted. The bells, which had not been rung as a peal for nearly thirty years, have been made serviceable again, and are now regularly rung. The whole works have been carried out by Mr. Thompson, builder, Peterborough, [Mr. J. O. Scott being the architect. The cost of the restoration of the tower has been about 600*l.*, but there is an additional expense for the belfry repairs.

#### The Student's Column.

##### TOWN DRAINAGE. II.—LOCAL AUTHORITIES.

THE first filip, as it were, was given to sanitary works by the passing of the Towns Improvement Clauses Act in 1847. Special Acts of Parliament had previously been obtained by certain towns for various purposes, including drainage and sewerage, and the principal clauses of these special Acts, which closely resembled each other, were embodied with others in a general Act; so that hereafter a special Act was applied for by any town, it was sufficient to describe briefly the object, and to incorporate the general Act of 1847. To facilitate the adoption of this Act, and to provide means whereby town drainage and other sanitary works might be carried out by local authorities, another Act was passed in the following year,—the Public Health Act, 1848. Under that Act Local Boards of Health were first established. At the same time, a General Board of Health, consisting of three persons nominated by the Crown, was formed to superintend the execution of the Act, and when the inhabitants of a town desired to adopt its provisions, and constitute for themselves a Local Board for the management of the streets and for the construction of drainage works, water works, and other town improvements, they applied to the General Board, in terms set forth in the Act, to institute an inquiry with the object of making the town a Local Board district. Such inquiries were made by inspectors appointed by the General Board, and when a boundary of the district had been agreed upon, and other things established, the Act was adopted. Much of the cost of obtaining a special Act of Parliament was thus rendered unnecessary by adopting the general Act of 1848, the General Board of Health being empowered by the Act to make such provisional orders as would enable Local Boards to carry out the intentions of the Act, the subsequent assent of Parliament being obtained by the General Board; and lawyers and others were thus deprived of a good deal of Parliamentary practice, which to them was anything

but pleasant. This General Board was appointed first for five years, and at the end of that term it was appointed for another five years, but on the expiration of the second term it was not reappointed. During the second term, and partly, perhaps, during the latter part of the first, there arose against it two forms of opposition,—one local, the other professional. Local Boards were required, as now, to appoint a surveyor, but, being duly appointed, they could not displace him without laying all the circumstances before the General Board and obtaining consent. With regard to the name of the office,—that of "surveyor,"—it was not in itself a wrong one, and, therefore, those who framed the Act had that excuse or justification for adopting it, but it led to many wrong impressions of the nature of the work the surveyor would have to do, and it must have been entered in the Act without due consideration. "Surveyor of roads," already made, is proper enough, but the construction of drainage works is a different thing. Truly, it may be said that it was expected that civil engineers would be called in to advise the sanitary authorities and to design such works as were required, but if that was so, the expectation was not generally fulfilled. The name "surveyor" being used in the Act compelled Local Boards and other sanitary authorities to adopt it in advertising that they desired to make such an appointment, and the consequence was that all sorts of surveyors,—road surveyors, land surveyors, and others,—became candidates for the office. Civil engineers rather held back, in many cases, from placing themselves alongside these, and architects certainly could not be expected to offer themselves. It was probably not taken into account that those who were to become members of the Local Boards about to be formed had had little or no experience of such things as the surveyor would have to do, and, further, that the work to be done was not altogether a voluntary work on the part of Local Boards. It was in some measure forced upon them, not solely by the General Board of Health, but partly by the evident necessity of remedying the bad sanitary conditions which surrounded them, and which they naturally desired to do at the least expense; and this consideration held great sway in their deliberations.

They were an elected body, and looked forward to their re-election chiefly through the means of economy; and, unfortunately, that which has since proved to be the true economy, viz., the construction of sound and scientifically designed works, was not understood by the majority of members of Local Boards, or by Town Corporations in many cases; indeed, these last were often worse in this respect than the newly-created Local Boards, for the first members of these did make an attempt to carry out the Act to the spirit in which it was framed to them; and Local Boards insisted upon being properly advised by professional men, in some cases by appointing civil engineers to the office of surveyor, and in others by calling in civil engineers for the occasion, the works so designed being carried out by the permanent "surveyors." But those members of Boards who followed this line of policy, as being most likely to lead to true economy in the long run, did not long retain their seats. At future elections,—not always the next one, perhaps,—the fear of expense in doing those things the benefit of which they did not understand, led many to offer themselves for election for the sole purpose of preventing money being spent upon anything whatever. There was a clause in the Act to the effect that wherever the rate of mortality had been for seven years 23 or more per thousand of the population per annum on the average of the seven years, the General Board were empowered to appoint an engineering inspector to visit the place and report upon what was desirable to be done, whether in drainage, or water supply, or otherwise. But unless the rate of mortality was as stated, the initiative rested with the Local Board, or the Corporation, as the case might be. Where a Corporation had a special Act this clause did not apply, but in other cases it was put in force, and was very obnoxious to the local authorities, and, through their influence, to the inhabitants generally. It was not, however, in all cases of excessive mortality that the General Board exercised the powers given by the Act. Amicable correspondence was no doubt sufficient in most cases to convince Local Boards of the desirability of



doing what had been so long neglected. Still, the obnoxious provision of the Act remained, that the surveyor could not be removed without the consent of the General Board, which was looked upon as too great an interference with the will of the Local Board. A surveyor sometimes enticed upon his duties with a complete knowledge of what was wanted, and with a determination to carry it out, requiring no instructions or assistance from the General Board. Under these circumstances a Local Board could and did carry out their own work in a proper and economical manner, so that the medical officer was able to report, after a few years' time, that the town was much more healthy than it had ever been since registrations of mortality had been made. But, in the meantime, the so-called economical members of the Board could probably find opportunities of complaint against the surveyor, threatening his removal, whereupon the saving clause of the Act may have come in usefully, enabling him to retain his office long enough to see, along with everybody else, the result of his work. But more frequently the surveyor has been only too ready to resign his office under a Board he could not but consider ungrateful, disclaiming any appeal to an authority outside his own. Nevertheless, the protecting clause remained for those who liked to take advantage of it, and during the second five years' term of appointment of the General Board there arose great opposition to that Board's continuance, from the two sources named—the local and the professional. It was opposed by many civil engineers, who deemed it to be an interference with their rights, that in the case of town drainage, water supply, and other municipal works, their plans should be subject to the inspection and approval of the superintending inspectors, who were appointed by the Board under the powers of the Act of 1848. There was nothing to prevent an inspector being appointed from the Corps of Royal Engineers. No doubt some of those who were appointed were qualified for the duty, and the plans of civil engineers were generally approved almost as a matter of course, but in a few cases it was not so; judgment seemed to be lost by the rise of passion, on one or both sides, and the plans were not formally approved. Thus the local feeling on the one part and the professional feeling on the other were combined, too strong to enable the General Board of Health to maintain its position, and a great commotion in the country was the result. All this arose because at that time the members of Local Boards had not had sufficient experience in their position, and acted upon a dread of what might be, rather than upon what they had had any experience of; and, secondly, because civil engineers were not consulted in the first instance in the framing of the Act; that is to say, there was an inclination to consult others than those of that profession. But, looking at the whole proceedings, it may be said that if the General Board of Health had continued in existence to the present time, and, with its experience, had modified the somewhat arbitrary demeanour which perhaps may be justly attributed to it, a great deal of expense would have been saved to inhabitants of towns in the prevention of premature deaths, sickness, and pauperism.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

1,442, Flushing Water-closets, &c. W. Baird.

Instead of using mechanical connexion between the seat and the flushing-valve in the class of closets wherein a movement of the seat operates the flushing-valve, fluid pressure is employed by this patentee, and the pistons, being actuated by the movement of the seat, control the flush of water.

1,612, Fireplaces. W. Foulis.

The bottom bars of the grate which is the subject of this patent are removable, and below these a fire-brick chamber is constructed, extending down to the floor-line. A door is fitted to admit air, and a close-fitting door is also fitted on the front of the grate, closing up the front bars. Air is thus admitted gently, and slow combustion results; but, when the doors are removed and the bars replaced, the arrangement is similar to that of an ordinary fireplace. The portion of air entering to the fire from below is partially heated in passing through the brick chamber and assists combustion.

1,717, Preventing Down-draughts. P. Clark.

This invention consists in hot-air flues formed in fire-bricks, and back and sides of stove; also a hollow portable cone placed in the top of the stove

and a smoke-consuming chamber placed on the top of the fire-back.

2,641, Artificial Stone. W. E. Constable and J. Joseph.

According to this invention, limestone rock and Portland cement are treated with sulphuric acid, and blocks are moulded in wooden receptacles lined with steel.

2,955, Sewer Pipe. A. H. Ford, and E. G. Wright.

A series of louvers or blades are arranged by the inventor, either on the interior or exterior of the convex part of the pipe, so as to form a continuous disjointed air passage or channel along it. The ends are provided with an inlet and outlet, the current of air being induced by a downcast pipe in conjunction with an upcast pipe or shaft, travelling along an air passage, attracting the ascending gases, and carrying them off at suitable apertures.

13,162, Automatic Closets. A. Kersten.

In order to separate the solid and liquid matters, and to prevent servants from throwing waste and blocking up the soil-pipe, elaborate mechanical arrangements are described by this patentee for effecting the purposes designed.

## NEW APPLICATIONS FOR PATENTS.

Dec. 21.—18,667, G. Birkenhead, Retaining Door Knobs on their Spindles.—18,678, F. Jones, Preventing the Emission of Smoke from Chimneys, &c.—18,705, H. Condy, White Lead.—18,706, E. Edwards, Waterproof Roofing Material.

Dec. 22.—18,736, W. Horn, Fireproof Iron Buildings.—18,771, W. Millar and Others, Fireproof Building Construction.

Dec. 24.—18,810, H. Faulkner, Imitation of Polished Marbles, Granites, Glazed Tiles, &c.—18,811, S. Hazeland, Wood-planing Machines.—18,834, J. Wilkinson, Window Fastener.

Dec. 27.—18,865, T. Dryford, Water-closets.—18,866, T. Teyford, Lavatory Basins, Fittings, &c.—18,883, J. MacNaughton, Window Sashes.—18,893, C. Geen, Air-inlet Ventilators.—18,896, F. Hunsinger, Roofing Tile.—18,912, A. de Villapigue, Levelling Apparatus.

Dec. 28.—18,935, J. Thorpe, Door-handles.—18,944, E. Johns, Lavatory Wash-basins, &c.—18,976, G. Fry, Heating and Ventilating Green-houses, &c.

Dec. 29.—18,986, W. Taylor, Perforated Case and Roller Ventilator.—19,010, G. Sharpe and F. Turner, Cement for Plaster, &c.

Dec. 31.—19,037, T. Fraser, Exhaust Ventilator or Chimney-pot.—19,064, T. Cantwell and R. Randall, Flooring.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

15,503, W. Cussans, Bolt or Fastener for Doors, Windows, &c.—15,725, S. Worsencroft, Cows or Ventilators.—16,087, R. Bluck, Bricks, Tiles, Pipes, &c.—16,262, P. Naisie, Manufacture of Portland Cement, &c.—16,650, H. Atkinson, Raising, Lowering, Retaining, and Counter-balancing Windows, &c.—16,687, J. Burn, Sash-fastener.—16,704, A. Mattison, Ceiling-hook.—16,884, A. Del Guerra and D. Stefano, Securing Doors.—17,049, T. Mattock, Plumbers' Shave-hooks.—17,570, J. Carpenter, Reversible Sliding-sash Windows.—17,796, W. Roberts, Hanging Window-sashes.—17,970, W. Lindsey, Window-sashes.

## COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

1,819, E. Lucas, T-squares.—1,978, W. Joy, Manufacture of Cement.—2,708, A. Stevens, Securing Scaffolding.—2,839, W. Steil, Water-closets.—3,354, T. Thomson, Compositions for Wall-decoration, &c.—4,672, J. Troop, Ventilator.—5,399, R. Stone, Paint.—17,186, W. Maguire, Water-closet Basins, &c.

**Estate Exchange Report.**—The *Estate Exchange Register* says that the auction sales of property reported to the 31st ult. realised the sum of 4,393,160*l.*, besides 54,580*l.* realised by private contract sales reported in last month. The total of sales reported from January 1 to December 31 was 4,447,840*l.* as against 4,453,878*l.* in 1885, 4,120,044*l.* in 1886, and 3,989,099*l.* in 1887.

**Indian Section of the French Exhibition.**—A special committee has been appointed for taking direction and charge of the Indian Department of the British Section at the Paris Exhibition. The committee have approved of the plan of the Palace for the exhibition of the Indian exhibits. The building will contain twenty shops or stalls, each about 10 ft. square, which are to be let to Indian exhibitors. In the front of the building a verandah will be utilised for the sale of Indian teas. The committee have received a number of applications from intending exhibitors. The charges to be made to exhibitors and to the purveyors of tea have been calculated on such a scale as barely to cover the actual cost of erecting and maintaining the palace.—*Indian Engineer.*

## MEETINGS.

MONDAY, JANUARY 14.

Royal Institute of British Architects.—Special General Meeting for the Award of Studentships, Medals, and other Prizes. 8 p.m.

Surveyors' Institution.—Adjourned Discussion on Mr. A. D. Wells's paper on "The Prospects of an Agricultural Revival." 8 p.m.

Artists' Exchange.—Meeting of the Committee. 3 p.m. (Auction Mart).

TUESDAY, JANUARY 15.

Institution of Civil Engineers.—Further discussion on Mr. E. Worthington's paper on "The Compound Principle as applied to Locomotives." 8 p.m.

Statistical Society.—7.45 p.m.

Carpenters' Company.—Dinner, 5.30 p.m.

WEDNESDAY, JANUARY 16.

Society of Arts.—Colonel Hoiler, on "The Channel Tunnel." 8 p.m.

British Archaeological Association.—(1) Major H. A. Joseph on "The Subscription for Building St. Antholin's Steeple." (2) The Rev. S. M. Mayhew, F.S.A. (Scott.), on "North Catfiness and Orkney." 8 p.m.

Royal Meteorological Society.—Annual General Meeting, when the Report of the Council will be read, the Election of Officers for the ensuing year will take place, and an Address will be delivered by the President (Dr. W. Marcet, F.R.S.) on "Fogs." 7.15 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual Meeting. 8.30 p.m.

Inventors' Institute.—Mr. F. M. H. Jones on "Silicate Cotton as a Fire-proofing Material." 8 p.m.

THURSDAY, JANUARY 17.

Society for the Encouragement of the Fine Arts.—The First Conversazione will be held in the Galleries of the Royal Institute of Painters in Water Colours. 8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 18.

Architectural Association.—Mr. E. Radford on "The Support and the Architecture of Equipoise." 7.30 p.m.

## Miscellaneous.

**Strasbourg.**—On the Kaiserplatz, a large space which divides the old city of Strasbourg from the new quarter, a new Imperial Palace has just been completed, from the designs of Herr Eggert. It is a three-storey building, measuring 222 feet by 157 feet, in severe Italian Renaissance, and is constructed entirely in stone and iron. The façades are in grey sandstone, quarried in the Vosges mountains, and the roofs are covered with red tiles. The cost, including the site, was 133,000*l.*

**Pro-Cathedral, Kensington.**—We hear that a ladies' committee has been formed, under the Duchess of Newcastle's presidency, for raising a fund in aid of paying off a debt of 11,000*l.* in connexion with this church. It is hoped to present the fabric, free from debt, to Cardinal Manning, on June 8 next, that day being the twenty-fifth anniversary of his episcopate at Westminster. The Pro-Cathedral was built after the designs of the late George Goldie, architect.

**Further Extension of the Hamburg Harbour Works.**—It has already been found, says the *Börsenhalles*, that the great harbour works opened last autumn (of which a description was given recently in these columns), do not suffice for the traffic. Consequently plans have been prepared for the construction of another harbour on the other side of the Elbe, the cost being estimated at 150,000*l.* The work is to be begun at once.

**Drainage Extension Scheme, West Ham.**

—The Corporation of the County-Borough of West Ham, at their meeting on Tuesday last, adopted the scheme of drainage extension, including new pumping-engines, submitted by Mr. Lewis Angell, M.Inst.C.E., at an estimated cost, in its entirety, of about 100,000*l.* The more pressing sections of the work will be first undertaken.

**New Museum at Naples.**—Naples journals announce that the well-known art collector, the Prince di Satriano, has presented to the city of Naples the whole of his famous collections of arms, carved *objets d'art*, porcelain, miniatures, tapestry, &c. The collections, together with a fine library, are located in the Palazzo Como, and are open twice a week to the public.

**New Barracks at Warley, Essex.**—Operations have been begun on Warley Common for an extensive enlargement of the barracks, including two magazines, to store twenty-five tons of powder apiece. The War Office have also bought several acres of ground between Epping and Ongar for the accommodation of, it is said, 5,000 men.

**An Expensive Cathedral Roofing.**—The Swedish Government has decided upon re-roofing entirely with new copper the ancient Cathedral of Upsala, now in course of restoration, the cost of which is estimated at about 10,000*l.* Up to the present some 25,000*l.* have been expended in restoring other parts of this edifice.



**Ventilation of Public Buildings.**—Fainting attacks have long been of familiar occurrence in popular churches and other places of public meeting. A variety of causes are active in bringing about these troublesome ailments. As chief among these, and quite distinct from any personal predisposition, we would only mention two,—overheating and impurity of atmosphere. Both are to a great extent preventable; but we may say that, though some success has been gained in the way of prevention, very much remains to be done before we can expect to find the air in our larger assembly-rooms nearly pure enough to satisfy the needs of a large audience. When we think of the duration of some gatherings, and picture the sea of human figures which occupy all available floor space, and crowd into flanking galleries, we are inclined to ask, not why it is that faints occur, but why they are not more common. The breathing air allowed each individual is roughly represented by a cubical column, having the area of his seat and a very limited space around it for its section, and ascending to the ceiling. Into this reservoir each individual emits breath every few seconds, and in it shares the unavoidable exhalations of his neighbours, while its upper layers are contaminated by the impure carbonaceous products of lighted gas. Add to this that, in changing the air, the rate of ingress and egress must be limited by precautions for the prevention of draughts, and we cannot but see that in many such cases efficient ventilation is almost, if not quite, impossible. Happily public meetings are not always thus overcrowded, but experience amply proves that in those which are less fully attended the same evils are present in a less degree. The introduction of the electric light has brought some relief, and the purifying action of artificial ventilation, as represented by the fan system and the heated exit flue, is constant, though slow. Still, it cannot be denied that much imperfection is evident in most systems of ventilation. This fact, if a stimulus to fresh effort, also embodies a useful protest against the overcrowding and the long continuance of many public gatherings, whether for amusement or for graver purposes.—*The Lancet.*

**Society of Arts.**—The following arrangements have been made for the Wednesday evening meetings of the Society of Arts after Christmas. On January 16, a paper will be read by Colonel Hoizer, on the "Channel Tunnel," on the 23rd one by Professor George Forbes, on "Electric Meters for Central Stations," and on the 30th one by Mr. Conrad Beck, on the "Construction of Photographic Lenses." Papers for which dates have not yet been fixed will also be read on the "Status of the County Council," by Mr. G. L. Gomme; on the "North Bridge," by Mr. B. Baker; on "Salt," by Mr. F. L. Simmonds; on the "Manufacture of Aluminium," by Mr. William Anderson; on "Secondary Batteries," by Mr. Preece; on "Automatic Selling Machines," by Mr. J. G. Lorrain; on "Arc Lamps and their Mechanism," by Professor Silvanus Thompson; on the "Irish Lace Industry," by Mr. Alan Cole; and on the "Use of Spirit as an Agent in Prime Movers," by Mr. A. F. Yarrow.

**The English Iron Trade.**—The English iron market has opened strong in the new year. Although there has been a momentary lull, prices continue firm, as they could not be otherwise with the favourable prospect before the iron trade. Pig-iron is enjoying a fair inquiry. The Glasgow warrant-market has been dull this week; but Scotch makers' iron does not appear to have been much affected. Pig-iron is somewhat weaker in the North of England, owing to the unexpected increase in stocks. A hardening tendency is showing itself in the Lancashire pig-iron trade, and there is firmness also in Staffordshire. Hematite pig is quieter, but firm at 45s., f.o.b. There is an upward tendency in prices of finished iron, works being busy and the demand brisk. Scotch makers of bars have advanced them 5s. a ton. Tin-plates are quieter, but manufacturers are holding out for higher prices. Steel is growing firmer, and advances of 2s. 6d. a ton for billets and wire-rods are reported. Rails are also stiffer, 4½ being more easily obtainable lately. Both shipbuilders and engineers are beginning the new year well.—*Iron.*

**Colbath Fields.**—Her Majesty's Office of Works has invited tenders for the erection of new buildings, with the adaptation of existing premises, in Mount Pleasant, for the superintending engineer of telegraphs. Tenders must be deposited by noon on the 15th inst.

**British Archaeological Association.**—At the meeting of this Association on the 2nd inst., Mr. B. Winstone, F.S.A., in the chair, it was reported by Mr. Loftus Brook, F.S.A., that an extension of the North British Railway was contemplated near Lanark, and that the lines of deviation of the deposited plans included an important part of the wall of Antoninus, near Bonnybridge. A resolution was proposed by Mr. J. W. Grover, F.S.A., and duly carried, to the effect that a strenuous effort should be made to avert the danger in which the wall was placed. Mr. J. T. Irvine exhibited a collection of drawings of ancient remains recently found near Peterborough, among which were portions of stone interlaced work from the tower of Helpstone Church, now in the vicarage gardens, and part of a cross-shaft, also of interlaced patterns, now lying in a mason's yard, having been used as pitching to a public road at Caistor. A paper was then read by Messrs. Peters, the historians of Llanecston, on the remains of the ancient priory of that town, which have been recently found in making an extension of the railway. These works revealed the foundations of the day-room. Further excavations for the gasworks have laid bare a large portion of the east end of the Priory Church. The foundations of the presbytery, 56 ft. long and 19 ft. wide, and also those of two side chapels, each 15 ft. long and 11 ft. 6 in. wide, have been exposed to view, also several graves and encaustic tiles. A paper on the representation of a Roman house on one of the remarkable Roman mosaic pavements, recently placed on the staircase of the British Museum, was then read by Mr. De Gray Birch, F.S.A. The pavement is one of the fine series brought from Carthage by Dr. Davies. A third paper by Mr. Swainson Cowper was then read. It described a curious moated enclosure at Acton, on the road to Willesden. It consists of an irregular parallelogram surrounded by a broad, shallow ditch, there being no visible means of crossing the latter. It is situated in a field known as the moated meadow.

**New Vestry Stables at Fulham.**—Last week, Mr. Walter, chairman of the Carriage Committee of the Fulham Vestry, laid the foundation-stone of new vestry stables in the Munster-road, Fulham, the erection of which has just been commenced. The stables will provide accommodation for forty-four horses, and a drinking-fountain will likewise be provided for the use of the men. The stables will cost £5,000. Mr. Norrington, the Vestry surveyor, is the architect, and the builders are Messrs. Flew & Co. In the course of the proceedings, incidentally speaking of the progress which Fulham had made during the last two years, when the old Fulham District Board of Works, which included Hammersmith, was dissolved, Mr. Walter stated that sixty new streets had been taken over since New Year's Day last year, and that within that period the population had enormously increased.

**Building in Sheffield in 1888.** Mr. W. C. Fenton, Building Surveyor, has presented to the Highway Committee his sixth annual report of the work done in connexion with the Plans and Buildings Department in 1888. Plans have been approved for the erection of 1,098 houses and 120 other buildings (including 39 buildings of the works and warehouse class and 33 stable buildings), as compared with 928 houses and 139 other buildings (including 30 of the works and 30 of the stable class of buildings), being an increase of 170 houses and a decrease of 19 other buildings on the previous year. The number of houses certified as completed and fit for human habitation is 806, as compared with 928 in the previous year, and 725 in 1886. The number of other buildings completed is 91 (including 21 stable buildings and 29 of the works class) as compared with 98 in the previous year (including 19 stable buildings and 27 of the works class).—*Sheffield Telegraph.*

**Raffety, Thornton, & Co., Limited.**—We are informed that the directors of this company will, at the general meeting of shareholders on the 29th inst., recommend the payment of a dividend at the rate of 7 per cent. per annum (free of income-tax) for the half-year ended December 31, 1888, making 7 per cent. for the year; and that they will also recommend the payment of a bonus of 1 per cent., writing 2,500*l.* off goodwill account, and carrying forward 1,514*l.*

**The Royal Archaeological Institute.** We hear, has fixed on Norwich as the centre of its annual excursion, next August.

**Experiments in Joining Sewers and House-Drains.**—In presence of a large company of civil engineers and surveyors, some interesting experiments were made at Chiswick on Tuesday last, in the laying of sewers and house-drains with the Archer joint, a new invention, the object of which is to make sewers and house-drains permanently air and watertight,—a condition which it is often difficult to obtain in the case of the common pipe. This new joint (which was described and illustrated in the *Builder* for July 14 last, p. 32) consists of a grooved socket and a projecting spigot, with inside and outside flanges, which, when the spigot is driven home, meet the inner and outer walls of the socket, and form a chamber inside the joint. The face of the flanges of the spigot-end are dressed with a roll of clay, so that the chamber holds the liquid cement poured into it through the holes in the outer wall of the socket. The cement, setting hard, forms a water-tight joint. At Chiswick, a perpendicular column of 9-in. pipes, about 9 ft. high, connected with a horizontal length of 11 ft. of pipes, supported at the ends only, was filled with water, and though the horizontal pipes were weighted with about four hundredweight of bricks, the joints remained watertight and intact. For the purpose of showing the interior of the joint, some of the pipes were smashed, and many of the surveyors present carried away the stoneware sections or pieces of the joint, showing the spigot thoroughly keyed and fixed on all sides by the hard cement. 4-in. pipes for house connections were shown successfully under considerable pressure. The contractor who is laying the pipes on Mr. Pullman's estate, Grove-park, stated to the engineers assembled that the men were laying the Archer-jointed sewers more cheaply and quickly than the common pipes when the latter were jointed with tar-gasketing and cement. The experiments seemed to be considered highly satisfactory, and many of the surveyors expressed their intention of using them in their own districts.

**The Hospital Saturday Fund.**—The Lord Mayor has consented to preside at a meeting to be held at the Mansion House, on the 29th inst., in support of the proposed penny-a-week collection in aid of this Fund, when the co-operation of employers of labour will be earnestly invited, and the claims of the London medical charities strongly urged upon all who can influence the scheme. It is proposed to establish a Local Committee in every Parliamentary district in connexion with the Hospital Saturday movement for the purposes of the above penny-a-week collection. Mr. A. C. F. Coote, in a circular which we have received relating to this subject, says that 100,000*l.* roughly represents the annual deficit of the London hospitals. "Five hundred thousand pence per week represents 108,000*l.* per annum. London contains some five million inhabitants. If one in ten of these regularly contributed 1d. a week our London hospitals would be out of debt."

**Treat to Workmen in Kendal.**—On Thursday evening, the 3rd inst., Mr. G. E. Moses gave a tea to all the workmen that have been engaged on the new Victoria-road, from the lower part of Highgate to the upper portion of Beater Banks, and to the workmen who have been employed on the new corner shop and dwelling-house at the junction of the New-street with Highgate. Each man had a ticket given him to admit self and wife. About 200 sat down to table. Messrs. Webster, Son, & Banks were the engineers for the new street, and under their superintendence the works have been carried out by local men. The architect of the shop and dwelling-house is Mr. John Stalker, of Kendal, the works having been carried out by local contractors.

**A well-known London Builder's Will.**—The will of the late Mr. William Brass, late of Old-street, St. Luke's, the well-known builder, who died in January last, was proved the week before last, by Mr. W. B. Robert Brass, the executor, the value of the personal estate exceeding 162,000*l.* The deceased bequeaths 250*l.* to each of his executors, 100*l.* to each of his clerks, and 50*l.* to his secretary. His younger sons are to have the option of joining in the business. The residue of his real and personal estate he leaves to all his children in equal shares.

**Value of Property in Stockholm.**—From statistics just issued it appears that the tax-value of house property in the city of Stockholm was 2,700,000*l.*, as against 1,500,000*l.* ten years ago.



**The Wood Trade in 1888.**—Messrs. Foy, Morgan, & Co.'s annual wood report, 1888, says:—"The past year has shown better results for the wood trade than have been able to chronicle for a long time. Bad debts have been few, and although London has not felt the improvement in trade to the same extent as the Northern ports, prices have steadily advanced throughout the year. The stocks, though fully sufficient for all probable demands, are firmly held. The free-on-board prices now current are practically a guarantee that early shipments will not reduce spot quotations; but, on the contrary, if importers are to make any profit, the prices of goods here must have an upward tendency. Freight has been one of the remarkable surprises of the year. They opened quite reasonably, but with only a small number of vessels offering, and steadily rose throughout the summer in sympathy with freights all over the world, attaining their highest during October and November, since when they have been a little easier. The Dock stocks seem at first sight heavy in comparison with those of 1887, but, with the prospect of an improving trade throughout the country and a more hopeful feeling generally, holders should have no cause for fear results. It is pretty evident also that unless the trade are willing to face the present f.o.b. prices for the earlier shipments they will have to fall back upon the landed stocks or give a profit to those who have already bought. Auctions have been the means of passing into consumption, as in 1887, only a moderate quantity of goods, but dealers have this year largely availed themselves of this method of clearing their cargoes. The imports from Russia have been fully up to the average, although the consignments have been somewhat smaller than of late years. Archangel goods have specially sold well; thirds from this port have been eagerly sought after, the quality being very satisfactory. Whitewood, in sympathy with spruce, has been very firm, and has sold well. The stock is not large, and demand good and improving. The import from Sweden again shows more batten sizes, and the stock, though larger than the previous year, is by no means beyond the capacity of consumers. Prices have improved steadily since the early arrivals, and, although third deals have been difficult of sale here, fourths and fifths have been in good demand; the requirements of the Colonies, however, for the better class of goods have greatly assisted the home market. The heavy lines of planed deals have gone into consumption wonderfully well. The quality and condition of the shipments have been very satisfactory, and the higher qualities have, as a rule, been stowed under sheds."

**Sales of Property in 1888.**—At the London Auction Mart, during the year just closed, there has been a decided improvement in the number and extent of transactions in real property. Throughout the whole year this improvement has been very marked; but, perhaps, even more so in the last three or four months. We find, on referring to our reports, that property to the value of 4,447,840*l.* was sold at the Mart last year, representing an increase of 458,741*l.* on the previous year, 1887, and within only 6,088*l.* of the sales in 1885, which was considered a favourable year as regards the Property Market. As the sales at the Mart, in Tokenhouse-yard, may be taken as a fair criterion of the sales throughout the country, the transactions in real estate in the year just closed must be taken as denoting a revival of public confidence in the land and property market.—*Estates Gazette.*

**A New Cemetery for Willesden.**—The Local Board of Willesden are about to form a new cemetery, for which they have already purchased land in the neighbourhood. The estimated cost of the cemetery is 20,000*l.*, and the Board have obtained the sanction of the Local Government Board for borrowing this sum.

| TIMBER (continued).                          |     | £ s. d. | £ s. d. |
|----------------------------------------------|-----|---------|---------|
| Deals, Finland, 2nd and 1st std.             | 100 | 0       | 10      |
| Riga " 4th and 3rd.                          | 7   | 0       | 8       |
| St. Petersburg, 1st yellow                   | 10  | 0       | 10      |
| " 2nd "                                      | 8   | 0       | 10      |
| " white                                      | 8   | 0       | 10      |
| Swedish                                      | 7   | 10      | 16      |
| White Pine, 1st                              | 8   | 10      | 0       |
| Canada, Pine, 1st                            | 18  | 0       | 26      |
| " 2nd                                        | 11  | 0       | 17      |
| " 3rd, &c.                                   | 7   | 10      | 0       |
| " Spruce, 1st                                | 7   | 0       | 0       |
| " 3rd and 2nd                                | 7   | 0       | 0       |
| New Brunswick, &c.                           | 6   | 15      | 0       |
| Butternuts, all kinds                        | 6   | 10      | 0       |
| Flooring Boards, sq., 1 in., prepared, First | 0   | 11      | 0       |
| Second                                       | 0   | 8       | 0       |
| Other qualities                              | 0   | 8       | 0       |
| Cedar, Cuba, foot                            | 0   | 2       | 0       |
| Honduras, &c.                                | 0   | 3       | 0       |
| Australian                                   | 0   | 3       | 0       |
| Mahogany, Cuba                               | 0   | 4       | 0       |
| St. Domingo, cargo average                   | 0   | 4       | 0       |
| Mexican                                      | 0   | 4       | 0       |
| Mahogany, Tobacco, cargo average             | 0   | 4       | 0       |
| Honduras                                     | 0   | 4       | 0       |
| Box, Turkey                                  | 0   | 12      | 0       |
| Rose, Rio                                    | 13  | 0       | 19      |
| Bahia                                        | 13  | 0       | 18      |
| Saia, St. Domingo                            | 0   | 6       | 1       |
| Porto Rico                                   | 0   | 9       | 0       |
| Walnut, Italian                              | 0   | 4       | 0       |

| METALS.                    |     | £ s. d. | £ s. d. |
|----------------------------|-----|---------|---------|
| Iron—Bar, Welsh, in London | ton | 4       | 17      |
| " at works in Wales        | ton | 4       | 15      |
| " Staffordshire, in London | ton | 6       | 15      |
| Copper—                    |     |         |         |
| British, cake and ingot    | ton | 79      | 0       |
| Best selected              | ton | 79      | 0       |
| Sheets, strong             | ton | 83      | 0       |
| Chili, bars                | ton | 77      | 0       |
| Yellow Metal               | lb. | 0       | 9       |
| LEAD—                      |     |         |         |
| Sheet, English             | ton | 14      | 10      |
| Strait                     | ton | 18      | 12      |
| Sluice, special            | ton | 18      | 12      |
| Ordinary brands            | ton | 18      | 10      |
| TIN—                       |     |         |         |
| Strait                     | ton | 99      | 10      |
| Australian                 | ton | 99      | 10      |
| English Ingots             | ton | 101     | 10      |
| ZINC—English sheet         | ton | 21      | 0       |
| OILS.                      |     |         |         |
| Linseed                    | ton | 18      | 7       |
| Cocanut, Coochin           | ton | 28      | 0       |
| Ceylon                     | ton | 27      | 0       |
| Palm, Lagos                | ton | 28      | 10      |
| Rapeseed, English pale     | ton | 31      | 15      |
| " brown                    | ton | 30      | 5       |
| Cottonseed, refined        | ton | 25      | 0       |
| Tallow and Oleum           | ton | 19      | 0       |
| Lubricating, U.S.          | ton | 5       | 0       |
| Tar—g. refined             | ton | 7       | 0       |
| Archangel                  | ton | 1       | 1       |

## COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

### COMPETITIONS.

| Nature of Work.                                       | By whom Required.            | Premium.                     | Designs to be delivered. | Page. |
|-------------------------------------------------------|------------------------------|------------------------------|--------------------------|-------|
| Laying-out Estate for Building Purposes               | Tile House Estate, Tonbridge | 4 <i>l.</i> and 20 <i>l.</i> | Feb. 17th                | xi.   |
| Improvements & Extension of Pier, Southampton Harbour | Southampton Harb'r Bd        | 100 Guineas                  | Not stated.              | ii.   |

### CONTRACTS.

| Nature of Work, or Materials.                               | By whom required.                               | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------------------------------|-------------------------------------------------|-----------------------------------|--------------------------|-------|
| Swimming Baths                                              | Royal Leamington Spa Corporation                | W. de Normandie                   | Jan. 14th                | xi.   |
| Slop Carts                                                  | Tottenham Local Board                           | J. E. Worth                       | Jan. 15th                | xii.  |
| Wood Paving Repairs, Sowerage Works, &c.                    | St. Margaret & St. John (Westminster) Vestry    | G. R. W. Wheeler                  | do.                      | ii.   |
| Works and Materials                                         | Wendworth Rd. of Wks                            | Official                          | do.                      | ii.   |
| Four Corrugated Iron Warehouses                             | Milford Dock Co.                                | do.                               | Jan. 16th                | xii.  |
| Iron Buildings                                              | Hackney Union                                   | do.                               | do.                      | xiii. |
| New Carriage Shed, Manchester                               | L. & N. W. Ry. Co.                              | do.                               | do.                      | ii.   |
| Making-up and Paving Road                                   | St. Mary (Battersea) Vestry                     | J. T. Filditch                    | do.                      | xiii. |
| Works and Materials                                         | do.                                             | do.                               | Jan. 22nd                | xiii. |
| Roadmaking Works                                            | Lewisham Rd. of Wks                             | Official                          | do.                      | xi.   |
| Pump Grinders and Delivery Pipes                            | Richmond Main Sewage Board                      | J. C. Melliss                     | do.                      | xi.   |
| Making-up Roads, &c.                                        | Feltham, &c., Loc. Bd.                          | P. Oldfield                       | Jan. 23rd                | ii.   |
| Dunze Hall, Kitchen, &c. Fulham Workhouse                   | St. George's Union                              | H. Saxon Shell                    | do.                      | xiii. |
| Breaz, &c.                                                  | St. Mary-above Vestry                           | Official                          | Jan. 24th                | xi.   |
| Horses and Slop Carts                                       | do.                                             | do.                               | do.                      | xi.   |
| Road and Street Watering                                    | do.                                             | do.                               | do.                      | xi.   |
| Road Materials & Royal F. & K. Pipes and Irregular Castings | Com. of H. M. Wks. & Calcutta Corp. Water Works | J. Quirk & Son                    | Jan. 25th                | xi.   |
| Post Office, North Shields                                  | Com. of H. M. Works                             | Official                          | do.                      | xiii. |
| Furnace, with Boiler, Engine, and Machinery                 | Corsewall Local Board                           | T. de Courcy Meade                | Jan. 26th                | ii.   |
| Waterworks Extension                                        | Warwick Town Council                            | E. M. Richards                    | Feb. 9th                 | xii.  |

### PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised.   | Salary.     | Applications to be in. | Page. |
|------------------------|-----------------------|-------------|------------------------|-------|
| Surveyor               | Shanghai Mun. Council | 3,600 taels | Jan. 28th              | xiii. |

### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BOURNEMOUTH.**—For alterations and additions to Pine Cottage, Warborne, Messrs. Kemp-Welch & Co., architects and surveyors.—

S. Minty..... £119 16 0

W. Jones & Son (accepted)..... 75 0 0

**BOURNEMOUTH.**—For alterations to the London Hotel, for Mr. J. B. Walden, Messrs. Kemp-Welch & Co., architects, &c.—

F. Hoare & Son..... £108 10 0

F. Walden..... 99 10 0

Jenkins & Son (accepted)..... 79 0 0

**COBBHAM (Survey).**—For the erection of a house at Fairmile, Cobham, Surrey (Loversall), for Mr. W. A. Dawson, Mr. William C. Banks, architect, 38A, Gracechurch-street, E.C. 4.—

Wood, Cobham..... £1,690 0 0

Newland, Cobham..... 1,500 0 0

Munday, Wimbledon (accepted)..... 1,198 0 0

**CLAPTON.**—For new laundry and alterations. Mr. J. E. Still, 50, Finsbury-square, E.C. 4, architect.—

Hook, Clapton..... £218 12 0

Withers, Clapton..... 207 5 0

Ford & Kirrage, Upper Holloway..... 190 10 0

**COVENTRY.**—For alterations and warehouses for Dalton, Barton, & Co., Coventry. Mr. E. J. Funnell, architect.—

Mayo..... £4,398 0 0

Worwood..... 4,233 0 0

Haywood..... 4,090 0 0

Hill (accepted)..... 3,890 0 0

**ENFIELD.**—For alterations to the stables at Little Park, for the Enfield Local Board. Mr. A. Kitteringham, surveyor.—

Fairhead, Enfield..... £287 0 0

Littlefield, Enfield..... 285 0 0

Pavey, Winchmore Hill..... 273 0 0

Sayers, Enfield (accepted)..... 257 10 0

**FELTHAM.**—For reinstating farm buildings and rebuilding barns, &c., for Mr. C. P. Shells, Messrs. J. E. Rouch & Co., Surveyors, 7, Queen Victoria-street, E.C. 4.—

S. Hunt, Chiswick..... £285 0 0

J. Walker, Poplar..... 845 0 0

Smith & Sons, Norwood (accepted)..... 297 0 0

**LONDON.**—For the erection of the new Pelican Club, Gerrard-street, W., for Mr. A. F. Wells, proprietor. Mr. Walter Emden, architect, 105, Strand. Quantities by Messrs. Evans & Deacon, 1, Adolphe-street, W.—

W. Brass & Son..... £5,620 0 0

H. Knight..... 5,613 0 0

J. T. Chappell..... 5,583 0 0

W. Johnson..... 5,580 0 0

Foster & Dicksee..... 5,255 0 0

Kirk & Randall..... 5,200 0 0

Holliday & Greenwood..... 5,140 0 0

Prestige & Co..... 5,100 0 0

R. G. Huttley..... 5,043 0 0

E. & H. F. Higgs..... 4,970 0 0

J. Smith & Sons..... 4,967 0 0

J. Allen & Sons..... 4,888 0 0

J. O. Richardson..... 4,820 0 0

G. Stephenson (accepted)..... 4,678 0 0

**LONDON.**—For the erection of coachhouses and stables over, &c., Scawell-street, Hackney-road, E., for Mr. T. Cook.

J. Ivory (accepted)..... £750 0 0

[No competition.]

### PRICES CURRENT OF MATERIALS.

| TIMBER.           |           | £ s. d. | £ s. d. |
|-------------------|-----------|---------|---------|
| Greenheart, B.G.  | ton       | 6       | 10      |
| Teak, E.I.        | ton       | 0       | 14      |
| Sequoia, U.S.     | foot cube | 0       | 3       |
| Asi, Canada       | load      | 3       | 10      |
| Birch             | ton       | 3       | 10      |
| Rim               | ton       | 4       | 0       |
| Fr. Dantico, &c.  | ton       | 2       | 0       |
| Oak               | ton       | 2       | 0       |
| Canada            | ton       | 5       | 10      |
| Pine, Canada red  | ton       | 3       | 5       |
| Lath, Dantico     | ton       | 3       | 10      |
| St. Petersburg    | ton       | 6       | 0       |
| Walnut, Riga, &c. | log       | 2       | 15      |
| " Odessa, crown   | ton       | 2       | 15      |

LONDON.—For the erection of stables at Farm-lane, Waltham-green, for the London Road Car Company. Mr. Peter Dollar, Architect.—

|                        |         |   |   |
|------------------------|---------|---|---|
| Dove Bros.             | £12,175 | 0 | 0 |
| Rider & Son            | 11,395  | 0 | 0 |
| Higgs & Hill           | 11,140  | 0 | 0 |
| Smith                  | 10,854  | 0 | 0 |
| Prisman & Fotheringham | 10,851  | 0 | 0 |
| Toms                   | 10,588  | 0 | 0 |
| Freestige & Co.        | 10,269  | 0 | 0 |
| Chappell               | 10,169  | 0 | 0 |

LONDON.—For the erection of stables at King's-road, Chelsea, for the Improved Cab Company. Mr. Peter Dollar, Architect.—

|                        |        |   |   |
|------------------------|--------|---|---|
| Lawrence               | £7,023 | 0 | 0 |
| Prisman & Fotheringham | 6,867  | 0 | 0 |
| Toms                   | 6,883  | 0 | 0 |
| Smith                  | 6,735  | 0 | 0 |
| Flew & Co.             | 6,773  | 0 | 0 |
| Holliday & Greenwood   | 6,749  | 0 | 0 |
| Harris & Wardrop       | 6,579  | 0 | 0 |
| Freestige & Co.        | 6,468  | 0 | 0 |
| J. T. Chappell         | 6,288  | 0 | 0 |

LONDON.—For pulling down and re-erecting the shop and premises, No. 135, Tottenham Court-road, W., for Mr. C. S. Davis. Mr. John Hudson, architect, 80, Loman-street, E.—

|                                                |        |   |   |
|------------------------------------------------|--------|---|---|
| T. Little, Whitechapel                         | £1,777 | 0 | 0 |
| J. Bentley, Waltham Abbey                      | 1,737  | 0 | 0 |
| W. Gladding, Whitechapel                       | 1,598  | 0 | 0 |
| Baton & Co., Whitechapel                       | 1,529  | 0 | 0 |
| Canning & Mullins, Newington, S.W.             | 1,559  | 0 | 0 |
| Con-ell Bros., Bethnal Green                   | 1,493  | 0 | 0 |
| J. H. Thompson, Newington Green, N. (accepted) | 1,490  | 0 | 0 |

LONDON.—For alterations and repairs to the house and premises, No. 87, High-street, Whitechapel, E., for the George-yard School trustees. Mr. John Hudson, architect, 80, Loman-street, E.—

|                                     |      |   |   |
|-------------------------------------|------|---|---|
| T. Little, Whitechapel              | £237 | 0 | 0 |
| J. Sparks, Tower-hill               | 742  | 0 | 0 |
| F. & F. J. Wood, Mile-end           | 723  | 0 | 0 |
| W. Gladding, Whitechapel            | 642  | 0 | 0 |
| Baton & Co., Whitechapel (accepted) | 549  | 0 | 0 |

LONDON.—For alterations and additions to No. 6, Finsbury-circus, for the Central Railway Company (Limited). Mr. Alfred Strong, architect, 7, Adelphi-chambers, W.C. Quantities by Messrs. Parr & Sons, New Broad-street House, E.C.—

|                       |       |   |   |
|-----------------------|-------|---|---|
| Celle & Son           | £2965 | 0 | 0 |
| T. Nye                | 965   | 0 | 0 |
| Adamson & Son         | 933   | 0 | 0 |
| W. H. Lascelles & Co. | 910   | 0 | 0 |
| J. Woodward & Co.     | 850   | 0 | 0 |

LONDON.—For alterations to No. 7, Finsbury-circus, for the Buenos Ayres Great Southern Railway Company (Limited). Mr. A. Strong, architect, 7, Adelphi-chambers, W.C. Quantities by Messrs. Parr & Sons, New Broad-street House, E.C.—

|                 |      |   |   |
|-----------------|------|---|---|
| Lascelles & Co. | £385 | 0 | 0 |
| T. Nye          | 385  | 0 | 0 |
| Adamson & Son   | 396  | 0 | 0 |
| Celle & Son     | 390  | 0 | 0 |
| Woodward & Co.  | 355  | 0 | 0 |

LONDON.—For addition and alterations to dwelling house, The Green, Tottenham, for Miss Phillips. Mr. E. Ernie May, architect, 1, St. James's-street, S.W.—

|                               |      |   |   |
|-------------------------------|------|---|---|
| Henry Knight & Son (accepted) | £257 | 0 | 0 |
|-------------------------------|------|---|---|

[No competition.]

LONDON.—For pulling-down and re-building 91, Central-street, City-road, E.C.—

|                  |      |   |   |
|------------------|------|---|---|
| Green & Lee      | £230 | 0 | 0 |
| J. O. Richardson | 318  | 0 | 0 |
| Elliot           | 305  | 0 | 0 |
| Kellaway         | 276  | 0 | 0 |
| Deering          | 254  | 0 | 0 |

LONDON.—For alterations and sanitary work to 1, Summer-terrace, S.W., for Mr. Stephen. Mr. Hammett S. Furner, architect, Ealing.—

|                                   |      |   |   |
|-----------------------------------|------|---|---|
| Wm. Thomas & Sons, Grafton-street | £263 | 0 | 0 |
| John Jones, Sydney-street, S.W.   | £23  | 0 | 0 |

PLUMSTEAD.—For additions to Woolwich Union Infirmary, Plumstead, Kent, for the Board of Guardians of the Woolwich Union. Mr. John O. Cook, architect. Quantities by Mr. C. W. Brooks.—

|                  |         |   |   |
|------------------|---------|---|---|
| East Bros.       | £10,460 | 0 | 0 |
| Johnson          | 10,400  | 0 | 0 |
| Mutton & Wallis  | 10,100  | 0 | 0 |
| Stiff            | 9,859   | 0 | 0 |
| Coombs           | 9,850   | 0 | 0 |
| Smith & Sons     | 9,725   | 0 | 0 |
| Knight           | 9,643   | 0 | 0 |
| Holliday         | 9,547   | 0 | 0 |
| Mollet           | 9,441   | 0 | 0 |
| Kirk & Randall   | 9,425   | 0 | 0 |
| Proctor          | 9,200   | 0 | 0 |
| Wallis & Son     | 8,934   | 0 | 0 |
| J. O. Richardson | 8,724   | 0 | 0 |

PUTNEY.—For printing factory for Mr. W. Patching, at Putney. Quantities supplied by Messrs. Brunsden & Henderson.—

|                   |         |   |   |
|-------------------|---------|---|---|
| Adamson & Son     | £21,405 | 0 | 0 |
| Knight            | 1,360   | 0 | 0 |
| Turtle & Appleton | 1,340   | 0 | 0 |
| Gregory           | 1,337   | 0 | 0 |
| W. Bishop         | 1,225   | 0 | 0 |
| T. Grant          | 1,188   | 0 | 0 |
| S. Aries & Sons   | 1,160   | 0 | 0 |
| Avies & Co.       | 1,005   | 0 | 0 |
| W. R. Williams    | 976     | 0 | 0 |

STOKE NEWINGTON.—For building shop in Broughton-road, Stoke Newington. Mr. B. A. Lewcock, architect, 88, Bishopsgate-street, Within.—

|                    |      |    |   |
|--------------------|------|----|---|
| Wilkins            | £129 | 10 | 0 |
| Stephenson         | 115  | 0  | 0 |
| Ivory              | 97   | 10 | 0 |
| Goodall (accepted) | 90   | 0  | 0 |

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, and for the Front Page by the same hour on WEDNESDAY. SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY morning.

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## TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied ex-ante from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum. Forwards to all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c., 30s. per annum. Remittances payable to DOUGLAS FOURDRINER, Publisher, No. 48, Catherine-street, W.C.

## BEST BATH STONE.

CORSHAM DOWN. | FARLEIGH DOWN.

BOX GROUND. | COMBE DOWN.

WESTWOOD GROUND. | STOKE GROUND.

THE BATH STONE FIRMS, Limited.

HEAD OFFICES: BATH.

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The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England. It is of the same crystalline nature as the Cheltenham Stone, but finer in texture, and more suitable for the finished work.

Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.]

## HAM HILL STONE.

Greater facilities have been provided for working these quarries, and the stone can be supplied in large quantities at short notice. Prices, and every information given, on application to the HAM HILL STONE CO., Norton, Stoke-under-Ham, Somerset.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.]

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# The Builder.

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## Later Scotch Castles.



THE second volume of the valuable work on "The Castellated and Domestic Architecture of Scotland,"\* the first volume of which we noticed in the *Builder* for December 25, 1886, is fully equal to the first in interest and in the number and variety of its illustrations. The authors, as before observed, divide the history of Scotch castle-building into four periods, of which the three first were treated of in the first volume, the second volume being entirely occupied with the works of the fourth period, ranging from 1542 to 1700. These, again, are sub-divided into "keep plans;" "L plans;" "Z plans," or plans with two towers at diagonally opposite angles; "castles with courtyards," and "departures from traditional types."

We have to deal in this period with the change from the old massive but semi-barbarous castle architecture, in which there was little or no attempt at architectural effect for its own sake, strength being the sole object, to the semi-palatial castle architecture of the Renaissance period, which slowly but surely invaded Scotland, as it had already conquered the rest of Europe. The authors remark at the outset on the curious anomaly by which the introduction of artillery, instead of leading, as one might expect, to a greater development of strength and mass in the castles, had the opposite effect, as far as regarded castles built as private residences. It was perceived that the new arm was too powerful to be permanently resisted by any such defences as a private castle-owner could erect, and the attempt to build castles to resist a siege was abandoned accordingly, and the nobles contented themselves with fortifying their dwellings so far as to be capable of resisting a sudden attack. The erection of castles to resist artillery, it was tacitly acknowledged, "must be a national matter, and the construction of castles of defence was henceforth left in the hands of the Crown." The authors also consider, and no-doubt rightly, that the Reformation, with

its accompanying secularisation of church property, was an indirect influence in the development of Domestic architecture in Scotland at this period; the nobles being enabled, to a great extent, to seize on and appropriate the church property, and being thus provided with funds to spend on building their own castles or mansions, by which-ever term the buildings may be called.

The history of the Scotch castle forms rather a contradiction to the ordinary rule that the plan and arrangement of a dwelling is the first thing to be influenced by change in habits and advance of civilisation. For the single tower, the Norman keep form is still used in the fourth period, and the L-plan is also common in the earlier period. The main distinction was in the architectural treatment, and even here many of the keep castles of the fourth period seem as stern and unadorned as their forerunners. Indeed, the general tendency of the later castles, nearly to the end of the period taken in this volume, is to keep their walls plain and unadorned up to the corbel-table of the parapet, above which decoration is allowed to have play, sometimes with considerable richness; and it is in this period of the style that the angle turrets, corbelled out boldly, and sometimes very adventurously, from the angles at the parapet level, became common and characteristic objects, which are, indeed, often supposed to be the most marked and constant feature of Scotch castles, although in reality they only become developed at a comparatively late date. The corbel string of the parapet becomes also a very important feature now, treated in over-sailing courses, decorated with a succession of small corbels (a kind of Gothic descendant of the modillion), or with heavy mouldings one over the other, sometimes raised and depressed in a manner suggestive of battlements inverted, as in a curious example given by the authors (page 401) from Allardyce Castle in Forfarshire. The corbelled-out angle turrets do not appear as if they were meant to serve any special purpose of defence; they give the building a stern and lowering expression, a kind of architectural frown on its countenance, but they appear to have been constructed more for the purpose of obtaining some additional small rooms in the upper portion of the building than with any object in adding to the defences. One of the most typical of these keep-castles is that of Udney, well known from the effective view of it given in Billings's work, where it is shown

as a plain cube of masonry, with rounded angles, rising from a level lawn, and with short built-out turrets at the angles above; two plain line elevations are given in the book before us, which do not, however, give a vivid idea of its picturesque character. The plans are also given, showing the four floors, one over the other, and the immensely thick walls. The ground-floor alone is divided out into two or three rooms by party walls; the other floors show each one large apartment within the main walls with small apartments formed in the thickness of the walls; in the top story the angle turrets form four little rooms opening out of the main room, which have quite the look of domestic attics, more especially as all their windows look outward at an angle of 45° away from the main building, and there is no suggestion of any opening so placed as to flank and defend the main wall. Altogether Udney is a curious example of a house retaining a very fortress-like appearance, but with little evidence of its having been, or intended to be, practically used as such. Since the date of Billings's work, it has been engulfed more or less in modern additions, which is the reason, perhaps, that the authors content themselves with an outline elevation of it as it formerly existed, without any attempt to give the picturesque appearance which no longer exists. The castle has been in the hands of the Udney family for centuries, and probably they were as reluctant as anyone else to see it deprived of its ancestral appearance; but the original castle could not, certainly, have been regarded as a very commodious family dwelling, according to modern tastes and requirements.

Of what are classified by the authors as the L-shaped castles, the well-known example of Glamis is one of the most remarkable, and even in its half-modernised state looks romantic enough for the associations of its name. The manner in which the quarter-circle of the staircase turret fills up the re-entering angle of the two wings is as fine and architecturally effective as if it had been devised for that especial purpose, though probably it was only regarded as the most convenient way to plan the staircase. In this and others of the larger and more elaborately-planned castles it may be observed that the corbelled-out angle turrets begin to come lower down on the walls, containing two stories of rooms instead of one. There seems to have been a progressive development of these features from earlier to later times; some embryo turrets of this kind appear in the earlier

\* "The Castellated and Domestic Architecture of Scotland, from the Twelfth to the Eighteenth Century." By David MacGibbon and Thomas Ross, architects. Volume II. Edinburgh: David Douglas. 1887.



period, as in Castle Campbell (shown on page 208, Vol. I.), where the turrets seem merely balconies thrown out from the parapet, not rooms with windows; while in late examples they come far down the walls, through two or three stories, showing that internal accommodation was their real object, for no defensive purpose could well be served by bringing them nearer the ground. But the play and variety of features of this kind in different castles is very remarkable, and forms quite a study in the picturesque of architecture. At Crathes, where the building in the lower portion is a mere bare mass of masonry rising out of the ground (none of these castles have anything in the shape of a plinth), the upper part shows an extraordinary play of fancy; at the end a semi-circular corbelled turret starts half-way up the wall, carrying a square corbelled-out projection above; at the angles the rounded sides are corbelled out square at two-thirds of the height; then a round angle-tower is corbelled out from this at one angle, a square one at the other, and a projecting dormer, on a semi-circular corbel, crowns the centre of the side: string courses ramp up and down the walls, and form in their vagaries panels for coats of arms. Craigievar Castle is another extraordinary pile, with square and circular corbelled turrets rising in profusion above the main corbel line, below which all is as plain as a rock. At Elcho Castle the fancy seems to have been to have great circular turrets rising from the ground, with corbelled square stages seated astride of them at the top. Although the general character of these and other castles is the same, and speaks of the same date and place, the variety of fancy displayed in their arrangement and outline is most remarkable. Very strange and characteristic, too, is the combination of these features of a semi-barbarous architecture with the gradually introduced bits of corrupt and peculiar Renaissance detail, many of which, in the shape of door-jambs and headings, resemble nothing to be found in any other part of the world; they are Renaissance details acclimatised to the rude taste of the Scotland of the day. The entrance-doorway at Peppermill House (p. 169) may be specified as a most peculiar example, having a small horizontal cornice over it, with a space over that enclosed by a lanky scroll pediment broken in the centre, beneath which is a coat-of-arms; while beneath all this, the bold roll mouldings of the square-headed architrave look almost like Early Gothic in character, as far as one can judge from the small-scale illustration given. Other equally bizarre combinations are found in the doorways, as in those of Northfield House and Granton House (pp. 184, 188), both Classic in general outline, with straight-lined pediment heads over, but with the most extraordinary mouldings,—great massive hollows and rolls, like Norman work,—and the pediment at Northfield is flanked by little pepper-pot pinnacles of most singular design, considering their date and accompaniments. One would not suggest for a moment such an absurdity as imitating these eccentricities; but the study of them might suggest some new ideas in the way of combination and adaptation of Renaissance elements, with a more refined order of detail.

What the authors denominate a Z plan is a plan in which an oblong parallelogram forms the main feature, with a large tower or block attached to two of the angles diagonally opposite each other, thus making the whole plan take a kind of zigzag line. In Claypotts Castle, which is one of the most remarkable-looking of these singularly-planned buildings, the large circular adjuncts at the angles form rooms on each story, opening out of the main block, and the staircase is in a smaller circular turret fitted into the joining of the larger one with the parallelogram. The internal division of chambers is carried out further than in most of the examples of the two former classes, and the fact that these circular angle towers, as they appear to be, are planned for living rooms, seems to indicate that the method of building employed was not for either defence or convenience, but simply because the people liked building in that way as a matter of

taste. Probably the feeling for circular towers was impressed upon the Scottish taste from the time when they were used as the strongest way of building, and the most convenient way of constructing staircases within a small space, and the use of the form was continued as a matter of predilection, after any practical reason for it had ceased. The most extraordinary feature of Claypotts is the manner in which these two circular wings (rather than towers) are finished above, being corbelled out into great square lumps, with the angles sailing far out from the circular wall below, and covered with saddle-back roofs and corbie-step gables. The whole combination is about as odd as anything could be, and looks like some of the pictures of architecture on German toy-boxes of bricks. Another form of the zigzag plan is that shown in Fraser Castle, a larger and more important building than Claypotts, in which one of the diagonal wings is square and the other circular. This castle, plain as usual below, has a remarkably rich corbel string, and is also noticeable for the pretty dormer windows and richly-treated large armorial panel between them, just above the corbel string. In reference to this feature the authors join issue with Billings, who makes no doubt that this more ornate portion was a subsequent addition; or, rather, that the substructure was of earlier date than is here given to it. Billings is very full of the idea of French influence on Scotch domestic architecture of the Renaissance date, in details of this kind. In regard to this example, Messrs. MacGibbon & Ross, who have certainly studied an immense number of examples of Scotch castles, have no doubt that the plan shows this to have been of the sixteenth century, and they point out (and are certainly right in this) that it was the usual custom in the Scotch castles to leave the lower portion quite plain, and to enrich, to some extent, more or less, the upper portion above the corbel-table. We must say, however, that, as shown in their drawing, this delicate and rich bit of detail does look rather like an insertion; we should like to examine the masonry before throwing over Billings. The authors notice that in this castle there is an example of the false use of gargoyles, and their introduction for ornamental purposes only, as those of the central stringcourse of the round tower; "as also those in the corbel table of the angle turrets and under the dormers, being inserted where there are one, two, and three stories between them and the roof from which they are supposed to conduct the rain-water,"—a passage which will be a consolation and a stronghold to various modern architects who are too ready to indulge in the same bit of nonsense.

Of the castles with courtyards, one of the most remarkable is certainly Fyvie, though it may seem odd to class it so, inasmuch as the buildings actually extend only round two sides of a quadrangle, and are therefore really L-shaped; but the plan belongs to a different and more advanced type than those previously classed as L-shaped. The gate-pile of Fyvie, with its two great circular towers joined at the top by an arch carrying a gable, and with the entrance-door and three tiers of windows under it, is among the entrances of private mansions what that of Peterborough is among cathedrals. The circular staircase, too, with its segmental arches with angle roll mouldings of Early Gothic character, radiating from the centre nevel, is a most remarkable piece of work. Pinkie House, as everyone knows, is remarkable for its rich and graceful internal detail, though externally it is not one of the most picturesque buildings of its class. Of all the fascinating bits in later Scotch castle architecture, however, Rowallan seems to bear the palm; there is a picturesqueness without display or pretence in those two circular turrets at the top of the external staircase, guarding the entrance, which has an indefinable charm, partly from the fact that they stand close together, the only circular turrets in the building, giving the charm of contrast

with the flat walls of the rest. We do not know if this is the real explanation, but this building certainly has a poetic character peculiar to itself. Readers who are well acquainted with its exterior aspect are not, perhaps, aware how much rich and interesting detail is contained within it.

We might have said far more about the interesting and picturesque bits of Scottish architecture illustrated and described in this book. The numbered illustrations in the two volumes amount to nearly a thousand, all of them carefully executed, and exhibiting an extraordinary and most interesting medley of Gothic and Renaissance fancies intermixed and jumbled in a manner which could be found in no other country. The illustrations are all from blocks printing with the text, and this, of course, renders it difficult to realise the best artistic result in regard to texture and effect; and perhaps our one criticism would be that the drawings of some of the most picturesque buildings illustrated are rather dry and hard in style. The exterior views of Rowallan, for instance, give no just idea of the really picturesque appearance of the building; and it would have been possible to have conveyed more of this even with the drawback of a rather hard and rebellious medium of illustration. The exteriors are in many cases overshadowed; they are evidently pen-drawings reduced; but less labour in shading, and some more effective touches here and there, would have given, even in block-printing, more of the character of the actual work, more of artistic expression. Every effort appears to have been made, however, to render the illustrations clear and accurate as to fact.

In a postscript the authors remark upon the great number of castles still existing in Scotland, of which no illustrations have been made and no account given. They subjoin a very long list of those known to them by name. They also add that they have spent occasionally weary days in the search for castles which were mentioned in gazetteers, but which had long ago disappeared, and they suggest a catalogue *raisonnée* of the castellated and domestic buildings of Scotland being prepared. They would also be glad to have information from those who can give it in regard to any castles of which they have not information at present. Mr. MacGibbon and Mr. Ross have worked well in illustrating the subject, and spared no pains, and they certainly merit the assistance of all who are interested in the ancient domestic architecture of Scotland. Meanwhile they have produced a most interesting and valuable book, which forms an important addition to the literature and illustration of castellated architecture.

#### STUDENTS' DRAWINGS AT THE INSTITUTE.

THE judges who were called upon to award the medals and prizes given by or through the Royal Institute this year can have found their task no easy one. The merit of the works in all the competitions, though not exceptionally great, was unusually equal. The Soane Medallion seems to be regaining its former popularity, and this year attracted the greatest number of competitors. It was awarded to a well-studied, practical, and not unattractive design of Renaissance character by Mr. Arthur Sykes. There is nothing very striking about it, either in the architecture, the general disposition and arrangement, or the drawing, but the whole is good; the building could be erected, would answer its purpose admirably, and be an ornament to any town and a credit to its architect. The staircase at the level of the reference library is awkwardly planned, and the accommodation for books is wholly inadequate, but the latter criticism applies equally to most, if not all, of the designs. The division of the main façade into a centre block and angle pavilions, the prominence given to the library floor by the range of great semi-circular headed windows, and



the provision of a central feature in the form of a lofty turret are all good characteristics, and the way in which provision is made for carrying the book galleries across the great windows is clever. Though we cannot be enthusiastic about the design, we entirely agree with the decision of the judges.

A medal of merit has been awarded to the design "Open to All," by Mr. George Kenyon, a scholarly work of pronounced French character and monumental effect. In plan, a good deal seems sacrificed to this monumental effect; there are no serious mistakes, and the thick solid walls and stately hall are good to behold; but the purpose of the building seems to have been a secondary consideration. In external effect the solid basement and open first story are admirable, but the effect is spoiled by a heavy and even ugly attic. The judges, in recommending this design for recognition, probably intended to mark their appreciation of the monumental and scholarly character of the work, a character too conspicuous by its absence in most of the other designs, whose merits appear to be wholly the result of individual cleverness, if they are not altogether borrowed, rather than of study or knowledge acquired.

The design under the motto "Terracotta and Faience" is well planned, the entrance and staircase especially so, the detail is carefully worked out, and the drawings are excellent; but, unfortunately, the general effect is heavy and tasteless. The striking piece of eccentricity represented in the masterly drawings under the motto, "Españe," for which Professor Aitchison strove unsuccessfully to obtain some recognition on Monday night, has rightly attracted more than usual attention. Whether it is beautiful, as the Professor declares, or ugly, as is the opinion of the Hon. Secretary of the Institute, may be matter of opinion; but there can be no doubt that it is a courageous and, in the best sense, strong attempt to escape from the trammels of commonplace, though it is totally unsuited for a library in any British city. The merits of the design would probably appear less if the drawings were less excellent; but there are some real merits, the chief of which is the concentration of rich ornament about the middle of the main façade and upper part of the building, whereby it is strongly contrasted with the broad unbroken wall surfaces of the other parts. That the plan is not altogether without merit, and that the important parts of the interior would be sufficiently well lit, will appear to any one who takes the trouble to look. Set down on a hot, sunny day in a quiet corner of some city in the land that inspired it, the building would certainly claim admiration; but, in a busy Midland English city, in English weather, readers would probably be repelled by its dismal unattractiveness.

Among the designs for a theatre submitted for the Tite Prize, there is nothing to claim any great amount of attention. The decision as between the successful one and that which obtained the second place would have been less easy but for the excellent planning of the entrances and exits by Mr. Frank T. Verity, who has secured the prize. Both designs are in an appropriate light description of Italian Renaissance; in both the grouping is effective, the detail correct, and the drawing neat and pretty, but neither exhibits any remarkable feature. The Grissell Medal, the subject of which, it must be confessed, was remarkably unattractive and difficult, was so ill-competed for that it was not awarded; the drawings sent in show only attempts at remarkable *tours de force*.

The drawings and sketches sent in competition for the Pugin Studentship are a little disappointing. The "blue ribbon of the profession" used to attract a larger number of serious competitors, and when they sent all, or nearly all, the sketches they had, there was little chance of their not doing themselves justice. This year we must say we expected something better of Mr. Mallows, the winner, as well as of Mr. Kitsell, who has, quite justly, not obtained any recognition. We

very much appreciate Mr. Mallows's strong, effective contrasts of light and shade, and his fearless use of the pencil; but are inclined to think Mr. Gimson's delicate and careful work, both with pen and pencil, is still better. The fire-dog from Haddon Hall, a bit of detail from Rouen, and a boy from some piece of Italian ornament, should be carefully examined. Of the other competitors, Mr. Begg has fully earned his medal of merit by his workmanlike and useful series of sketches. The Owen Jones Studentship has fallen to Mr. Lanchester for a large collection of careful and appreciative, if rather mannered, studies of Italian coloured decoration, in which he shows himself more as a painter than an architect, giving the appearance of the colours with all light and shade, without much in the way of notes to show how the effects are obtained. Mr. Massey gets a medal of merit for much more workmanlike studies, in which, however, the colour is but poorly represented. Mr. Farrow's studies from some fifteenth century rood-screens, are careful and in every way good; and Mr. Barnsley has made an attempt, which is not absolutely unsuccessful, to imitate Mr. Gerald Horsley's style of working.

The silver medal for measured drawings has been won by Mr. Allen, of Nottingham, for a carefully-executed series illustrating a part of Wollaton Hall. The geometrical drawing is neat and sufficiently good; but the freehand work, especially in the figures, is of the poorest: the drawings, both of Archbishop Abbot's Hospital at Guilford, and of a part of St. John's College, Oxford, for which Mr. F. W. Troup obtains a medal of merit, fall but little, if at all, behind the first.

The exhibition of drawings for this year's competitions is supplemented by selections from the work done on their tours by the Owen Jones Student of two years back, Mr. Gerald Horsley, and last year's Pugin Student, Mr. R. W. Paul, and we can give these works no higher praise than in saying they are as good as, or better than, those which gained their authors the opportunity of executing them.

#### APPROACHING COMPLETION OF THE RIVER CART NAVIGATION WORKS.

**T**HIS scheme, which has for its purpose the widening and deepening of the originally very small River Cart sufficiently to enable vessels of large tonnage to sail laden up to the town of Paisley, is now approaching full realisation. Paisley has hitherto ranked as an inland town, strictly speaking, but within the year it will possess a new harbour of large area, to which there will be easy access for ships drawing up to 18 ft. of water, and not exceeding 43 ft. beam. Practically, there will be no restriction as regards length. The works were described in some detail in the *Builder* of September 3, 1887, some months after the contracts had been allocated and entered upon, and it was then suggested that the autumn of 1889 would see the enterprise completed. This seems now quite certain of accomplishment, at least to the extent of a thorough practical opening of the full scope of the new navigation, while leaving, perhaps, some trifling waterside accessories to be subsequently completed. Active operations commenced just two years ago, and now a stretch of nearly two miles of the new channel (exclusive of the towing track) is in readiness. Rather more than half a mile is still in hand; but even here the whole of the surface widening is done, and the deepening is quite down to the point of low-water mark, with only a very well-defined residuum of dredging to overcome,—work which at this time is in active progress. The enlarged watercourse possesses 180 ft. of width at the surface (against less than 90 ft. before the works began), with a centre depth of 18 ft. at high water. The portions which are now finished furnish the idea of a truly spacious artificial waterway or inland ship canal,—narrower, it is true, than the

neighbouring channel of the Clyde to which it leads, but still of most promising proportions. Nor is the change of aspect confined to the broadened waterway alone. Dredgings have for the most part been disposed of by "making up" the low-lying and more sterile portions of the banks, and two years of this work have transformed certain bits of the surface out of all former knowledge. The material excavated and thus deposited has been chiefly a mixture of sand and clay, on the new dressing of which the farmers have already raised excellent crops of various sorts. The eastern wall of the new harbour at Paisley, extending to 1,100 ft., has been some time finished, together with the backing and levelling for the necessary quayspace and railway approaches. Shorter of the two, by about one-fourth, is the west or Nethercommon quay wall, a section which is now in vigorous progress. The course of the White Cart, as formerly pointed out, is singularly free from transverse impediment from its mouth in the Clyde, half-a-dozen miles below Glasgow, till well up amongst the streets of Paisley, a distance of about three miles. Up to this point the tide flows without any obstruction of the lock kind; there is only one intermediate bridge, and that to accommodate not a railway with frequent crossings, but a turnpike leading to no place in particular and used only by the scantiest of traffic. This bridge was built many years ago, during the course of former not very ambitious efforts at improvement on the Paisley water-course, and it was constructed on the lifting principle. When the present scheme became adopted three years ago there was no provision, much to the surprise of many, for the removal of the bridge in order to make way for one of a larger span, but only for the necessary strengthening of its foundations consequent on the increased depth of channel,—a part of the work which is now being proceeded with. It was feared that the existing bridge would constitute a serious obstruction, by placing an unnecessarily narrow limit to the breadth of ships using the improved navigation; but the cautious designers are already to a large extent justified, particularly in the successful passage, a week or two ago, of a dredger of the largest size, being quite 41 ft. beam. Some years hence, should the experience by that time attained, and the traffic prospect then ahead, warrant such a step, there will be no hesitation in substituting a new bridge of amply capacious span, but this measure is not called for just yet. Immediately above this crossing,—which is Inchinnan Bridge by name,—occurs the one actual divergence from the old course of the channel which the works present, consisting in a straight cut of a few furlongs to avoid an awkward elbow of the river, which, in times past, besides needlessly extending the course to be traversed, impeded the passage of vessels of any length, and suffered from a chronic disposition to silting and shoaling up. This new cut is practically finished, and the tidal stream will be turned into it at an early date. Deepening operations are just now going on with extraordinary diligence a little above the outfall into the Clyde, by aid of two powerful Priestman diggers; and some of the permanent mooring buoys have already been laid down for the accommodation of vessels bound inland for Paisley harbour. Excavations got from this section are not used for padding the adjoining fields, as is the case higher up, but are lightered to the mouth of Loch Long, and there shot to the sea bottom. The designing engineers, Messrs. Bell & Millar, of Glasgow and London, and the resident engineer, Mr. C. C. Lindsay, are sanguine of an easy completion within the period stated in a former *Builder* notice (above referred to), and after a careful inspection of the finished work and the portions still to be completed, there has arisen no cause for doubting the accuracy of the estimate. In view of the growing call for inland ship navigation all over the country, (particularly the present revival of a Forth and Clyde Ship Canal scheme, fully discussed in the *Builder* of Sept. 6, 1884), this example of



Paisley justly attracts an increasing attention; for, although only of very moderate length, it is essentially typical of undertakings of the kind; and, furthermore, is within a few months of being presented to the eye as a finished work, and, in its weekly and monthly traffic returns, as a virtual test of the value of large outlays of money within this particular department of engineering enterprise.

## NOTES.



ON Jan. 5 we made an appeal, "To Lovers of Greek Architecture," to assist a small fund to be applied, under the direction of the British School at Athens, in obtaining the materials for the publication of full-size profiles of the mouldings of Greek architecture, asking any who were desirous to assist in this good work to send subscriptions to the Treasurer for the Fund, Mr. F. C. Penrose, St. Paul's Chapter-house. The reasons for the interest attaching to this object were touched upon in the article referred to; there should be no need, however, to urge them on any architects who are properly acquainted with the Greek chapter in the history of architecture. The response has been very meagre so far, the subscription-list at present standing thus:—

|                                      |    |   |   |
|--------------------------------------|----|---|---|
| Messrs. Ernest George & Peto .....   | £3 | 3 | 0 |
| Mr. H. H. Statham .....              | 1  | 1 | 0 |
| The Proprietors of the Builder ..... | 2  | 2 | 0 |

We hope this short list will be added to materially. As we said in our former article, we are given to understand that 50*l.* would pretty well do what is required, and the fact that the matter is in the hands of Mr. Penrose and of the British School at Athens is in itself a security that the money will be expended in the best manner for its purpose. Surely there must be as many as fifty architects in the United Kingdom who are sufficiently interested in the study of Greek architecture to be willing to contribute a guinea towards providing for the illustration of an important class of details, representing in a peculiar manner the intellectual refinement of the Greeks in the treatment of every detail of their architecture, and which have never been adequately illustrated or recorded as yet. Messrs. George & Peto have shown the way very handsomely: who will follow suit? If we do not do it, the Germans will.

THE Wall of Antoninus Pius is seriously menaced in its most precious section, as was incidentally mentioned in last week's *Builder*, in a short account of the proceedings of the British Archaeological Association. A new branch of the North British Railway in the neighbourhood of Falkirk has been sanctioned, and the necessary ground, including a really magnificent bit of the *valium*, has already passed unconditionally into the hands of the Company, and will soon be in the clutch of the contractor. By care, exercised without any burden of money loss, the railway might be made, and still ancient work left with hardly an additional scar,—but who is to guarantee that this reasonable care will be exercised? If the ground is attacked in the unthinking way common to railway-makers and to the sub-contractors they employ, every vestige of this rare civil engineering relic of the second century of the Christian era will be swept away irrevocably. There are very few good samples of the work of Lollius Urbicus left, and this, now so imminently threatened, is far and away the finest of all. For some distance here the mossy track of the barrier has quite escaped cultivation all these centuries, and both ditch and earthen wall, the latter on its hidden foundation of stone, are there to be seen, little altered except in so far as they have been altered by intermittent impact of the elements. The late proprietor, Mr. Forbes, of Callendar House, Falkirk, has always placed a great value on the preservation of these remains, but most unfortunately, no saving conditions whatever were procured at the time of transfer. The Archaeological Society

of Glasgow took the matter up in no little alarm, and memorialised the managers of the North British Railway, with the result of eliciting a reply which is courteous enough, but provides not a scrap of certainty. Of course, precaution against the possibility of so deplorable an act of vandalism ought to have been officially practicable before the sanction of Parliament was given to the Bill; but unhappily the Monuments Preservation Measure of 1882 does not provide for timely action of the kind,—and now antiquaries are reduced to a posture of object begging and beseeching as the only means of averting what they would regard as a calamity. The new line which thus threatens archaeology in Scotland is a paltry branch fork, a mile or two in length, to supply the private needs of a fourth-rate chemical manufactory!

IN the neighbourhood of Argos excavations are being carried on by local enterprise which promise to be of considerable interest. Pausanias, in going from Argos to Tegea, passed to the right the hill of Lymcoe, covered with cypress trees. He notes that on the summit of the hill (II., 24-5) stood the temple of Artemis Orthia, in which were statues said to be by Polykleitos of Leto, Apollo, and Artemis. The site of the temple is pretty clearly indicated by masses of fragments of vases on the slope of the hill. The gymnasiarch of Nauplia, Johannis Kophnicotis, set on foot a system of excavation, and had the good luck to light almost at once on what there seems no doubt are foundations of the temple. A considerable portion of the ground-plan has been laid bare; some of the pavement still remains, and architectural fragments, painted tiles, lions' heads, and portions of cornice have been found. The sculptural portion of the "find" is in a very fragmentary state,—pieces of drapery, an arm, a thigh,—but considering that three statues by Polykleitos are known to have stood in the temple, these deserve the most careful examination. All the remains have been made over to the museum at Argos, already rich in many objects of interest,—notably the Eumenides reliefs. An account of the discoveries appeared in the *Gnomi*, the local Nauplia paper, but our account is taken from the *Berliner Philologische Wochenschrift*, 1888, No. 52. According to this paper, no thorough examination has as yet been made of either site or fragments by a trained archaeologist.

THE same paper (1889, No. 1) gives news of the rapid progress of a work of the utmost importance to students of Greek ceramics. Herr Hartwig has prepared, and is shortly to publish, a series of original and very accurate drawings of red figured kylikes. The drawings are to be life-size; they are all of vases hitherto unpublished, and many of vases till now unknown. The majority of them are inscribed with "love names," a subject to which Herr Hartwig has devoted special attention, and on which the publication of his views is eagerly looked for by archaeologists, as it is hoped some light may thereby be thrown on questions of vase-chronology. Paintings from the studio of Euphronios are to be very fully represented, but vases by Hieron, Duris, Phintias, and Peithinos will also appear. Herr Hartwig began his collection in Rome, and has greatly enriched it by examples from the little-visited Bourguignon collection in Naples, and also, it will interest English readers to know, many vases from the collection of Mr. Van Branighem which excited so much attention when exhibited at the Burlington Fine Arts Club last winter. As we hope shortly to notice the book in detail, we will not anticipate matters by a forecast of Herr Hartwig's views.

THE new Railway and Canal Traffic Act is soon making itself felt, and we hear from different parts of the country that various trades and industries are viewing its operation with considerable uneasiness. The railway companies, while apparently com-

plying with the order to discontinue giving special privileges to imported foreign manufactures, are, at the same time, making many advances in their charges on other traffic. No increase has been made in the ordinary class rates, nor does the classification itself appear to have undergone much alteration; but the advance has been effected by the withdrawal of rebates, and the abolition of special rates. The effect of the first of these two methods is most strongly felt by some of the Yorkshire collieries, while the latter operates much more widely. A vast system of "exceptional" rates has gradually and unavoidably grown up, the ordinary classification being frequently felt to be altogether inapplicable in the face of exceptional circumstances. Railway managers probably consider the present a good opportunity for making a clean sweep of these rates, and are cancelling them right and left. But however much relief they may experience from this operation, it becomes a serious thing for manufacturers and traders who find rates suddenly sprung upon them which are largely in excess of those upon which they have based their prices; and it will probably before long be found expedient to revert to the old special rates. In fact, it is understood that the railway companies will not be unwilling to reinstate some of these rates, their object in withdrawing them in this wholesale fashion being to permanently get rid of obsolete and partially inoperative ones. We are credibly informed that tons of paper have been used in the shape of "returns" from the different stations, showing the extent to which these exceptional rates have been used in the past, for the information and guidance of the officials at headquarters. It was announced last week in the South Staffordshire district that the action of the railway companies with regard to import rates would, undoubtedly, have a great effect upon foreign competition. Should this prove to be correct, it would, of course, mean a loss to the railways of a considerable amount of foreign traffic, with a corresponding accession of home business. They will, therefore, hardly find it necessary to maintain higher rates on the latter, to compensate them for the loss of traffic which must have been carried for a very small margin of profit.

THE Lord Chancellor's fresh set of Orders, as recast in terms of the Land Transfer Act, 1875, for making a new procedure and scale of solicitors' charges in registration business thereunder, will take effect on the 1st of February next. The more important alterations are as follow:—Applicants will themselves write, on prescribed forms, their descriptions, encumbrances, &c., of the lands, and their forms will then be duly filed. This will obviate the cumbersome and tedious process hitherto in vogue of copying all such particulars into a set of costly volumes. A person applying for a "possessory" title may make his declaration unaccompanied by a solicitor. Sheets of the Ordnance Survey maps can be deposited instead of their original separate maps, upon tracing-linen, as formerly required. By this means portions of lands sold can be more readily and clearly indicated; and an officer of the Survey Department will be deputed to attend for marking off from the original deposited map, a general ordnance map being adopted for index and register purposes. That Department is authorised to supply maps *ad hoc* at cheap rates. The new system will extend to the record of certain provisions connected with mortgages, such as calling in of capital, insurances, payments by instalment, &c.,—as yet excluded from charges of registered land. And for the inconvenient practice of requiring that nearly every document shall be witnessed and verified by a solicitor's statutory declaration, certificates by solicitors, bankers, magistrates, or oaths commissioners will be accepted as sufficient authentication. The Official Rules under the Land Charges and Searches Act came into force on the 1st inst.



THE suggestion for using the Crystal Palace for an International Exhibition in 1891, which has been more than once mooted in the columns of the *Times* by Mr. Ellis Lever and Mr. John Aird, is one which is well worth consideration, for the building is admirably fitted for that purpose, and is in a most attractive situation. The scheme would be, perhaps, the one possible means of pulling up the Crystal Palace out of its present unprosperous condition; an object which is probably not out of sight with those who recommend it. It may be questioned, however, whether 1891 is quite the time to select. The only ostensible reason proposed for it is that it is forty years since the Exhibition of 1851, for which the main portion of what is now the Crystal Palace was first erected. If it were fifty years that would be a reason for a jubilee celebration, but forty years is not a period generally recognised as an occasion for celebrations. Moreover, 1891 would unquestionably be too close on the heels of the great French Exhibition fixed for this year, which no exhibition that could be contained in the Crystal Palace could hope to rival.

RAILWAY COMPANIES would do well gradually to replace the open grates which are found in nearly every waiting-room in the kingdom for closed stoves. The difference in the general warmth of a foreign waiting-room warmed by a stove and that of an English one warmed, or attempted to be warmed, by a grate, is very noticeable. Of course, an open grate is worse in a railway waiting-room than elsewhere, because of the draughts which it helps to create. What more forlorn spectacle, again, is there than that of half-a-dozen passengers shivering in the corners of a room, seated on the benches which are fixed to the wall, whilst another half-dozen have monopolised the seats in front of the fire, thus effectually withdrawing the heat from the rest of the room—albeit, they are very likely being overdone as to one half of their bodies themselves.

AT Edinburgh the old musical bells of St. Giles's have found voice, after a silence of many years; but, alas! how thin and feeble! It was hardly worth the cost to reinstate the venerable musicians, whose performances, although they rejoiced the heart of our forefathers, are now too apt to elicit only a smile of contempt from their successors. An undertaking of great importance connected with the sanitary condition of the northern part of the city is likely to be carried out, viz., the construction of an intercepting sewer parallel with the Water of Leith. A plan has been prepared by the Burgh Engineer, which has met with approval, and it is contemplated to acquire the requisite authority for carrying it into effect. Amongst other contemplated improvements at Edinburgh, it is proposed to erect a new station for the Caledonian Railway in place of the present temporary erection. The site is a fine one for a public building, and at the time when it was acquired by the Railway Company it was proposed to erect a handsome station and hotel on it, after the manner of that at Charing Cross. Plans were prepared by Messrs. Peddie & Kinnear, but financial difficulties prevented their being carried out. The temporary station buildings are now in a dilapidated condition, and anything but creditable to the Company. The delay in providing an efficient station may probably, however, have been caused by the desire to provide something worthy of the site. Another improvement which is in contemplation is in reference to the small square to the west of St. Giles's Cathedral as a fit subject to operate upon. The buildings which form three sides of the square are not upon the same level, and there is an awkward slope from the High-street down to the Signet Library, and an equally unseemly line in front of the County Buildings. The matter has been taken up by the Town Council. A plan has been prepared by Mr. Robert Moreham, City Superintendent of Works, and a Com-

mittee formed to negotiate with the different owners.

THE Honourable Percy Wyndham's house, known as "Clouds," in Wiltshire, which was destroyed by fire on Sunday, 6th inst., scarcely comes within the category of one of "the ancestral homes of England." It was, in fact, built in 1880-5, in the modern English style, and at a cost of some 40,000*l.*, after the designs of Mr. Philip Webb, architect. A larger sum was expended upon the interior decoration, which included a great deal of wood-carving and choice furniture; so that the owner's loss, reducible, it is stated, by insurance,—has been estimated at about 100,000*l.* The southern tower, with the stabling and offices, escaped; a fine painting, by Mr. Burne Jones, in the central hall, is quite spoiled. Clouds is situated in the parish of East Knoyle, in the south-western corner of the county, near to Chilmark, Wardour Castle, and Fonthill, and five miles north of Shaftesbury. In the old parsonage-house close by,—since rebuilt, but not, we are informed, upon the former site,—Sir Christopher Wren was born, Oct. 20, 1632. The cruciform church of St. Mary was lately restored in memory of Bishop Sumner, of Winchester. The living is in the gift of the Bishop of Oxford.

A PROPOSAL for making the Albert Palace the home of a Polytechnic Institution has been brought prominently forward by the deputation to Mr. Anstie on Monday last. The institution of such a college is entirely to be desired in itself, and perhaps it is worth consideration whether it is not advantageous to secure an existing building which must come on the market at a low price, even though the building is little adapted in itself for such an institution. It is a shelter ready provided, no doubt. We do not think that much more than that could be said for it, however; and it will probably be found, if the Albert Palace be purchased for such a purpose, that there is more space and more building to attend to and keep up than is really wanted, which is always a disadvantage and a drain upon the revenue. Moreover, places built like that, with a great deal of glass roof, are cold and comfortless for occupation, and expensive to keep in repair.

WE congratulate our excellent contemporary, the *Field*, on having at last taken the step, which we took some years ago, of providing for the convenience of readers by presenting them with a paper all cut and ready for reading. The large size of the *Field*'s well-filled pages rendered this relief to the reader all the more desirable. Hitherto the reading of the *Field*, "our custom always of an afternoon" (on Sundays), was a pleasure not to be enjoyed without some serious preliminary taskwork with the paper-knife,—a business for which one had to brace oneself with firm resolve. Now the reader of the *Field* has only the trouble of turning over its pages to follow the multifarious information and entertainment to be extracted from them—to join in imagination in "a good run with Sir —'s hounds," or in the excitement of spearing "wart hog," or stalking ibex; to study the habits and history of "Pallas's sand grouse," or the scientific problem presented by the action of a bullet on the air through which it flies; to appreciate the pleasant reminiscences of dear old "Peregrines," and "assist" in the discussion of the status of the "amateur," or of the morality of employing an engine-driven punt for wild-fowl shooting.

M. CHARLES LUCAS writes to us from Paris that at the monthly sitting of the Committee of the "Société de l'Histoire de Paris et de l'Île de France" on the 16th of this month, he presented to the Society the number of the *Builder* for January 5, containing the restored view of "Paris in the Time of Francis I." M. Lucas adds:—"Le côté, à la fois pittoresque et consci-

cieux, de cette restitution archéologique du Paris des Valois a vivement intéressé les archéologues parisiens, qui ont décidé d'en conserver une mention dans le Bulletin de la Société, et ordonné le dépôt du n° dans les archives."

THE inability of the *Times* to make any reference to architects or architecture without blundering is really curious. In a review of the "Life of Street," published in the *Times* of the 11th inst., Street is referred to as having been "joint architect with Mr. Barry" of the Law Courts! Of course, the very point of the whole matter is that Barry was *not* joint architect; that there was an endeavour to make him so, and that Street contrived to frustrate it; and a considerable space in the biography is devoted to explaining away this action on the part of Street, or putting the best face on it. The writer of the review not only cannot have read the book he was reviewing, but must have been more than usually ignorant of contemporary architectural events not to have known that Street was sole architect of the building, which we never heard connected, in common conversation, with any other name than his. Other daily papers are, of course, little better as a rule; but it is certainly extraordinary that the *Times*, with all its wealth and its unique position, cannot take the trouble to see that a special and important subject like architecture should be treated of by writers who have some little knowledge of it. In regard to some subjects, public opinion would make it necessary to attend to this; but the fact is that the public in this country are so ignorant and indifferent about architecture that any dunce may write about it in a daily paper, for neither the editor of the paper nor its readers will ever know or care whether he is right or wrong.

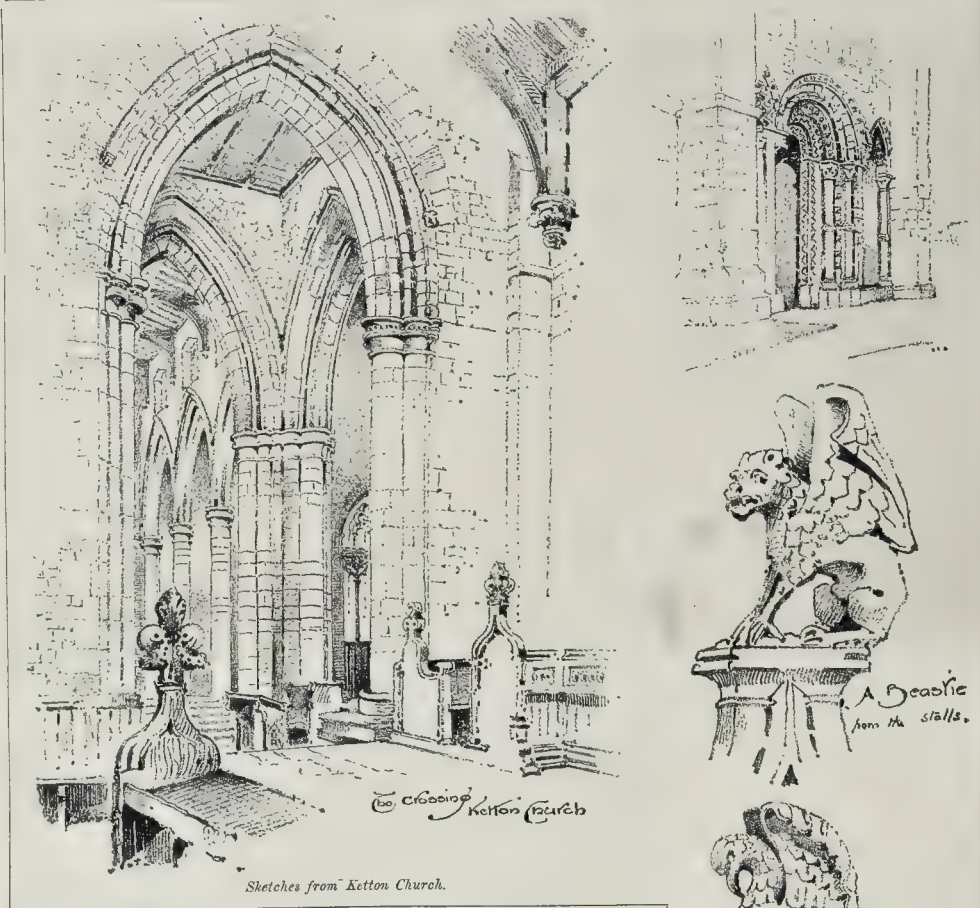
#### KETTON AND TICKENCOTE CHURCHES.

THE name of Ketton is, of course, familiar on account of the fine building stone which is obtained in the locality, but the church is not so well known as it deserves to be. It is charmingly situated in the midst of a quaint little village, nestling down in the hollow, almost hidden amongst the great elms which grow over in the church-yard itself; close by the stream is spanned by an old Gothic bridge of many arches and wide-spreading piers; the houses with their old-world aspect, their long, low, mullioned windows and stone-covered roofs all make up a picture delightful to the architectural student, who, sketch-book in hand, rambles through this, the smallest of English counties, finding treasures of which he knew little or nothing before. Ketton is easy of access, being about three miles from Stamford by rail; on the way is passed an interesting house called "The Nuns," which has been built upon the site of a former nunnery. During the excavations for the foundations many objects of architectural interest were found; these have been carefully preserved by the owner, and many also of the old mullioned windows of an older house have been retained in the new building.

The plan of Ketton Church is cruciform, with the tower and spire rising out of the intersection of the arms of the cross. It consists of a nave of three bays of wide span, and of singularly light and graceful design, dating with its north and south aisles from the thirteenth century; a south porch, north and south transepts, and a long choir, which is on a somewhat higher level than the body of the church. The treatment of the central tower as viewed from the interior is good, as shown by the sketch, which is taken from the south side of the choir looking west; the proportions of the piers and the simple mouldings to the arches are very pleasing, and the whole effect most happy. But the chief beauty of the building is in the belfry style of the tower, together with the elegant broach spire which surmounts it.

The belfry lights are six in number on each face of the tower. These lights are coupled together under moulded arches enriched with the dog-tooth, the jambs being deeply recessed in three orders with detached shafts, their capitals being carved with the stiff-leaf foliage of the Lincoln type; the dog-tooth ornament being also worked in the hollows between the





Sketches from Ketton Church.

shafts. This produces a very rich effect, which is heightened by the moulded cornice at the springing of the spire; this is peculiar to the district, and is to be met with in the steeple of St. Mary's, Stamford; it consists of a large bead worked in the form of a series of segments of circles, boldly projecting and deeply undercut, producing a strongly-marked and varied line of shadow, which successfully marks the termination of the tower and the commencement of the spire. The angles of the octagon spire are worked with rolls, ending at the base with grotesque carvings, and the broaches are surmounted by small niches, each containing a sculptured figure of rude workmanship, but effective when viewed from below. There are three tiers of lights in alternate faces of the spire, and the total height from the ground to the vane is 150 ft.

The western doorway to the nave is an interesting example of Transitional Norman to Early English work; it bears a strong family resemblance to the west entrance to St. Leonard's Priory, Stamford, and with the round arch, square abacus, and zig-zag and other Norman ornaments, unites the detached shafts and hollow mouldings of the thirteenth-century work.

There is some good fifteenth-century carving in a few of the bench-ends in the choir, and the arrangement also of the stalls is old, though the benches themselves are mostly modern.

Some three or four miles from Ketton there is the curious church in the village of Ticken-cote; an illustration of the chancel arch is given, which forms the chief interest of the building. The church itself appears to be all or nearly all modern, and the rector states that some years ago it was almost entirely rebuilt; every endeavour was made to copy the detail of the old building, but as it was done in the

early years of the Gothic revival, and under the superintendence of only a *dilettante* student of architecture, it is hardly surprising that the attempt has not been altogether successful; fortunately the arch remains untouched. It is supposed that the present nave is a later addition, and that the original church consisted only of the chancel as now existing, in which case the arch would have formed the western entrance; an examination of the structure confirms this theory, for the masonry of the two portions differs. The shape of the arch is curious, and its flat form is hardly to be accounted for by the supposition that the piers have spread and the arch settled; it is more probable that the arch has been rebuilt at some time, and through ignorance or blundering its present form has resulted. The building is reached by a short drive from Stamford, and is well worthy a visit, every explanation and every facility for inspection being afforded by the rector.

#### COMPETITIONS.

*Chelsea Club, Fulham-road.*—Designs were recently invited for the erection of a new entrance to the Chelsea Club, Fulham-road, S.W. It was unanimously decided at a meeting of the Board, held on Monday evening, to adopt those under motto "Victor," the author being Mr. Horace T. Roper, of King-street, Chesham, to whom the premium was awarded.

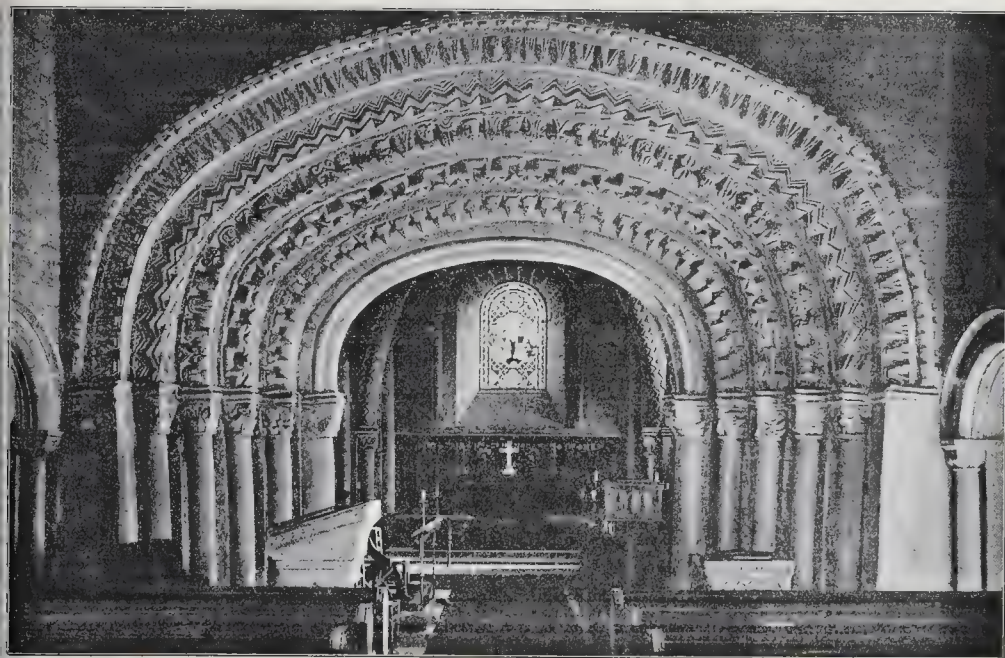
*New General Post-Office, Lisbon.*—The Portuguese Ministry of Works invites plans for new General Post and Telegraph Offices at Lisbon. The competition is open to architects of all nationalities, and designs must be sent in by October 28, 1889. Two premiums, one of 3,000,000 reis (666*l.*), the other of 2,000,000 reis (444*l.*), will be respectively awarded by a special

jury to the plans classed as first and second. These plans will become the property of the Portuguese Government. The building is to be 160 metres in length and 100 metres in depth, occupying a rectangular space of 16,000 square metres, seventy-six divisions or compartments being specified. The plans are to be on a scale of 1:100, and must be accompanied by detailed statements and estimates, as well as by a general descriptive memorandum of the proposed building.

*Engineering at a Sanatorium.*—Want of space compels us at the last moment to hold over the article announced under this heading.

*Nineteenth Century Art Society.*—Wednesday, the 23rd inst., has been appointed for the reception of works of art intended for the Spring Exhibition (the seventeenth) of this Society, at the Conduit-street Galleries.





Chancel Arch, Tickenhoe Church, Rutlandshire.

#### OBSTACLES OPPOSED TO THE ADVANCEMENT OF ARCHITECTURE BY ARCHITECTS THEMSELVES.\*

THE objects for which this Congress is met are the advancement of art generally,—and in our own section in particular the advancement of architecture,—and its application to industry. In other words, our object is to popularise art; to bring people generally to value and desire it; to accustom them to look for something beyond mere utility in the productions of industry of all kinds, especially in our own case in the matter of the construction of buildings, and to teach them to demand that these things shall not only be useful and convenient, but also well and beautifully designed.

We are, therefore, principally called upon to consider Art in its decorative aspect—that is to say, our business is not so much with the production of beautiful things as with the art of making things beautiful. Not so much, for instance, with the production of pictures to frame and hang on the walls, or of statues to set on pedestals or shelves in the gallery, as with the application of beautiful form and colour, by means of architecture, painting, and sculpture, to objects of daily use and convenience.

Of such objects our houses and other buildings are obviously the most important, and architecture is, therefore, the most important of the decorative arts; indeed, architecture differs from the other arts in this—that it is not, and cannot well be, anything but a decorative art. For architecture follows building. There must, first, be the building which architecture is to put into an artistic shape. Considerations of plan, construction, and materials come first, and it is the business of architecture to observe what forms are suggested by convenience of plan, necessities of construction, and nature of materials, and then by modifying the forms so suggested into harmonious proportions, drilling them into well-balanced compositions, ordering them into effective arrangement, and adorning each part suitably to its purpose or importance, to convert a mere object of utility into a work of art.

Of all kinds of art, therefore, Decorative Art

is that which matters most to society, because we are all of us, all day long, handling, using, and looking at objects which may either be beautiful and give us pleasure, or ugly and give us pain. And of all the decorative arts, architecture is the one which is of most consequence to the world at large, for it works on the grandest scale, and deals with things which we cannot avoid seeing. There is nothing to oblige us to look at bad pictures or bad statues, but we cannot escape the bad buildings that disgrace our streets, or avoid being annoyed by them whenever we go out of doors, unless, worse still, we grow used to them and cease to mind them, which can only come to pass by a corruption of taste.

Considering, then, that none of the arts is so near or so necessary to us, or capable of so frequently and constantly either pleasing or vexing us, it is a matter of astonishment to see the tolerance of bad architecture and the indifference to good which prevails; and this not only among those who care nothing for art, but even among those who are to some extent capable of appreciating excellence in the other arts when they meet with it. More wonderful still to relate, I have known painters eminent in their own art to house themselves in buildings of the most atrocious architecture, much apparently to their own satisfaction. Such instances are enough to drive one to despair, for if the artist fails to see the difference between good and bad work, what hope is there that others will see it?

What then is to be done to bring about a better state of things? How is the public taste to be trained to a better judgment in matters of architecture? How are we to teach the world to know good architectural design from bad?

I believe the methods of raising the standard of critical taste in our own art to be the same as in all the others. It is not to be done by lectures on the aesthetics of art; by attempts to spin moral lessons out of marble, stone, or wood, of which the craftsmen never dreamed, and which they were never intended to teach; it is not to be done by art congresses, such as this in which we are now taking part, if our meetings end in nothing but talk; least of all is it to be brought about by the fashionable art criticism of which we hear nowadays far more than enough, and which, while it is of no use whatever to the artist, serves only to supply the amateur with the means of showing off a little

cheap knowledge of matters which he will not take the trouble to study for himself. In architecture, as in the sister arts, it is not the critic, but the artist, who is the real instructor and the real agent in forming the public taste. This is merely saying, in other words, that it is not by talking, but by doing,—not by the ear, but by the eye,—that men are taught to know what is right in form and colour and beautiful in conception. One visit to a gallery will do more to teach the difference between good and bad painting than a whole course of lectures or a whole volume of art criticism. In many cases art criticism is, indeed, directly baneful in its effects, for it stupifies that natural sense which, when left alone, will, in many cases, lead to right conclusions. Every one must have met with instances of sound critical taste in quite uneducated persons; and I believe most people, if a good and bad design were placed side by side before them, would make a right choice if they could but dismiss all they had heard or read, and simply decide according to their own unbiassed inclination.

It is, then, to architects that the public have a right to look for the formation of a correct public taste in architecture, and not to any system of criticism however learned or philosophic. And it is by our works in brick and stone, wood and iron, that we craftsmen in architecture are to make our influence felt, and not by lectures or written papers,—such, for instance, as that to which you are now good enough to listen,—nor even by exhibitions of architectural designs on paper. Exhibitions of architectural drawings will never be popular; no one but architects, as a rule, goes near them; the room where they hang at the Academy is generally deserted; useful and necessary to the expert, they are uninteresting to the layman, and, therefore, can never have much influence on the public taste. Moreover, it must be remembered, that to architects and sculptors, drawing is not an end in itself as it is to the painter, but only a means to an end,—to the building or the statue,—and it is to the building or the statue we would have you look, and not to the drawing which was only instrumental in producing it.

If, then, the public taste will be good or bad according to the quality of the art set before it, healthy or unhealthy according to the food it feeds upon, which is a simple and reasonable theory enough, and if, consequently, the for-

\* Paper read by Mr. T. G. Jackson, M.A., F.R.S., architect, on Wednesday, December 5, 1888, at Liverpool, to the first Congress of the National Association for the Advancement of Art and its Application to Industry.



mation of a correct taste in architecture among their contemporaries depends on architects themselves, surely the first task of such a congress as this should be to inquire whether we architects are going to work in the right way to produce the best art of which we are capable. So far from this being the case, I believe the greater number of our architects are working under hopeless conditions, which must prevent not only any originality but even tolerably good work.

In what does the work of an architect properly consist? There certainly never was a time when the need of his directing hand was greater, and when his proper share of the work was larger; never was there a time when he had greater opportunity of impressing his personality on his work. What share the architects of old had in carrying out their buildings is not always easily ascertained. In the days of the Classic Renaissance probably very much was left to the trained workmen they employed. It is impossible, for instance, that Sir Christopher Wren can have done much more than give the general ideas for a great part of the enormous number of buildings all erected about the same time which are attributed to him. He knew his workmen, and he was, moreover, working in a style which was reducible to formulae unknown to the styles of the middle ages. The joiners and masons of that day were trained in the knowledge of Classic proportions, and they had books to consult, in which the orders and the several parts were drawn out and profiled with their proper modules and minutes, and there was but little variety in the character of the conventional ornaments employed. To a great extent, no doubt, these workmen were capable of working out correctly a door or a window-case, or even an entire order from the general sketches of the architect, and they were no doubt often trusted to do so. In the Middle Ages things were somewhat different; then, too, there were schools of skilled artisans, freemasons, and others, possessing knowledge of details, and capable of working out the parts of the general design by themselves; but the style was not bound by the monotony and regularity of Classic architecture; an infinite variety of form, plan, and ornament was at the builder's command; and without some one at the head, not only to give the general idea of the work, but also to design and order the details, it would have been impossible to have carried out the great buildings of Gothic architecture. Everything about them points to a single master-craftsman or architect, whose personality impressed itself on every part of his building, and gave it its distinctive character. The building contracts that have come down to the present day reveal him to us as acting in just such a capacity as I have supposed. We see him there not only designing his building on paper, and going now and then to look after the workmen as we do, but attaching himself to a particular building, and working upon it during the greater part of its growth. He was, in fact, the master-craftsman,—the true architect,—the master-mason and sculptor,—*Lapidista*, as the old deeds call him. Let me read a few extracts from a contract dated A.D. 1441, between a Bishop and his building committee and the "Careful man, Master George, the *Lapidista*," or stone-cutter, for the erection of their cathedral. The said Master George binds himself to come and live in the town during the next six years, during which he will work and cause to be worked by other workmen all and every the works, buildings, and ornaments of the said church, and will work with his own hand, both on the fabric and in the sculpture, in a manner creditable to any good sculptor and master of the stone-cutting art. Also he promises to go to the quarries and see to the proper supply of stone; also not to undertake any other work without the consent of the Committee; and generally he promises to direct as chief master the whole of the work, and all the masters, artisans, and labourers, giving them plans, measurements, and instructions, and correcting all defects.

Besides this contract, which relates to the building of the Cathedral of Sebenico in Dalmatia, I have lately seen other contracts of the same Master George, which define with equal or greater precision the work of an architect in the fifteenth century. His designs were made on paper or modelled in clay, and these were deposited with the notary and made part of the contract. In every case it is especially stated that his work includes the sculpture and ornament. In his agreement with the Republic of

Ancona for the Loggia dei Mercanti in that city, of which he built the façade in the year 1451, it is specified that "the said Master George promises to make in the said façade, as he has drawn it, all the sculptured idols of the full stature of a man, together with the great and fine horse, and the arms of the Comune relieved and sculptured in places drawn on the said paper drawing." Such is the general style and tenor of the agreements with Mediaeval architects in all countries of Europe; several of them in very similar terms are published in Mr. Street's book on Spain; and it is not uncommon to find the architect acting also as contractor, and undertaking to carry out the work for a certain sum.

From all this it appears that however skilled the workmen of the Middle Ages may have been, they worked under the direction of an architect who was always on the spot to tell them what to do and how to do it; who not only designed, but actually set out the work, combining in himself the duties of architect and clerk of works; and who, moreover, wrought with his own hand at the sculpture with which the building was adorned.

But if this supervision of the architect over every part of his building was necessary then, when he had under him a skilled body of artisans trained to the methods and traditions of a single school, how much more necessary must it be at the present day, when he has no such means at his command. Our artisans have no traditions, no method, and belong to no school. They may be set to work one week in one style, the next week in another, and the following week in something that does not deserve to be called a style at all. They may have to pass from a piece of Gothic tracery to a Corinthian entablature, and thence perhaps to a Victorian shop-front. They display a marvellous power of adapting themselves to new kinds of design, and I have often wondered at the ability they show in understanding directions and following patterns that are given them, however unlike anything they have been used to; but they are utterly and hopelessly at sea when left to themselves. Let any one who has theories about the liberty of the workman, and is in danger of pushing them farther than they should go, try the result of leaving the details of his architecture to the mason or the joiner, and he will soon find out the truth of what I have said. At no time in the history of art has it been more necessary that the architect should take into his own hands the whole design of his building and of every detail belonging to it. It is true we cannot go back to the old days when the architect was the *lapidista*, and wrought with his own hands on the fabric and its decoration, although the idea is not without its fascinations, although, so far as concerns the sculpture, it is surely the architect's business to design it and to correct the models in the clay, even if he does not model himself, or actually handle the chisel. Nor would it be at all desirable that the architect should ever again act as contractor as well as in the capacity of designer and superintendent. Nor need we in these days of posts and railways confine ourselves to one work at a time and go to live on the spot; but, it is indispensable that we should approach, as nearly as altered times and circumstances allow, to the old state of things when the architect saw to everything with his own eyes. The architect of to-day must think no part of his work too small for his attention, and he must not be content unless he feels that every detail of his building comes from his own hand. His construction will, of course, give the motive of the design; it will be carefully considered and every structural problem will be met and solved before the building is begun; and the architectural design will keep pace step by step with the construction, partly suggested by it and growing out of it, partly in its turn modifying it and making it obedient to artistic considerations. Without this intimate alliance of the two elements,—without this action and re-action on one another of the constructive idea and the artistic idea,—no good architectural design can ever be produced.

Two things distinguish the real architect from the mere pretender, his knowledge of construction and his knowledge of detail. The first enables him to give a reasonable character and a meaning to his design, the second enables him to carry it out successfully. Other people may be able to conceive grand architectural ideas as well as himself, but he alone can bring these ideas to the test of construction and find

out whether they are practicable; and, above all things he alone can make them worth anything by working them out with proper details. Good details, designed with feeling, neither too fine nor too mean for the occasion, and of proper proportion in scale and quantity, will give artistic value to a very unpretending building, and save a very modest design from being commonplace; while on the other hand, no matter how good a design may be, bad or unsuitable details will suffice to ruin it. The best amateur performances fail simply on this ground, the general conception being perhaps good, but the knowledge that is needed when it becomes necessary to descend to particulars being, of course, wanting.

The architect, therefore, who loves his art will leave no details untouched, knowing that through them lies the road to perfection. Everything will be thought out and studied, and the smallest matter will be designed as carefully as the more important. All those who are interested in modern architecture will be able to recollect some building they have seen which has been produced under these conditions, where the thought of the architect can be read, and his hand traced not only in the general design, but in the minutest feature. If it be a domestic building, in the mouldings of the panelling, or the locks and finger-plates of the doors, no less than in the halls and staircases. Or if it be a church, in the furniture and fittings, the sculpture, the pavements, the decoration in mosaic or glass, not less than in the mouldings of the arches, the traceries of the windows, or the outline of the spire. Such buildings as these are the more important, because they have character, and they thus owe to the impress of the architect's personality on his work. It is this that gives it its charm. Art is valuable only so long as the artist can be seen in it. It is a quality that may be shown in the plainest and humblest building, without any positive ornament, as well as with it, and it often makes the cottage a finer work of art than the palace. It is only buildings raised under these conditions that can really interest or charm us, and none others really deserve the name of architecture.

To some ears this may, perhaps, sound trite, and many persons who do not know how modern architectural works are produced will, perhaps, wonder that I should insist so strongly on it. But my point is this,—that it is only from architects themselves that any improvement in modern architecture can come, and that if our art, as a whole, is at present in anything but a satisfactory condition, the fault must not be laid at the door of society at large, but at that of the architects who turn out poor work, or bad work, principally because they do not practise it in the whole-hearted way of the craftsmen of old. Society is ready enough to appreciate good work when it gets it, and no architect who does his best need, so far as I have observed, complain of want of due recognition. Before we architects accuse the public of being indifferent, we shall do well to look at our own work, and see whether the work we turn out has any real claim to be interesting, and before we complain that they do not know good work from bad, it is our business to ask ourselves whether we have given them a fair chance of seeing what good work is. And, let me repeat it even at the risk of being tedious, art is only good and interesting so long as it bears the personality of the craftsman stamped upon it. Those modern buildings, therefore, only have a claim upon public recognition which are produced in the way I have indicated, and bear this stamp upon them; and on the whole, I think it will be observed that the public have not failed to find them out and appreciate them. Common experience will tell you that it is so. There are certain living architects whose work we all look at with interest; theirs are the designs which we search out in the exhibitions, and theirs are the buildings which we go to see, and from which we come away wiser than we went. The names of many such men will readily occur to you; there is no need for my mentioning them. They belong to various schools, and work in very different ways; their work is not always on an important scale, of expensive materials, or magnificent construction, for some of the very best modern work is to be found in humble and unpretending buildings; but, however they may differ in other respects, they have one thing in common, and that is that their work is all their own, for they are all men of whom we know that they leave nothing unconsidered, and that everything, even the minutest detail, is as much theirs as



the general design. In every detail we see signs of thought, we recognise the master's hand, and read the craftsman in his work. Consequently the building has character and individuality; in short, it interests us, and, moreover, it has that harmony and consistency in all its parts that naturally result from the fact of its being the product of a single mind.

It is hardly necessary to say that this is not the case with nine-tenths among the number of modern buildings. Never in the history of this country has there been anything like the amount of building that has gone on during the last fifty years, and never have so many buildings of a costly character and magnificent materials been erected. Never has our craft had such splendid opportunities of distinguishing itself, and never, one might have thought, would our art have been more likely to take a fresh departure and enter on a new life. Compare the palaces in which trade is now carried on with the coffee-houses and shops where the bankers and merchants of our grandfathers' time were wonted to make their money and see their customers; or the clubs that line Pall Mall and St. James's with the Mitre or the Thatched-house of the beginning of the century; or the amount of building of new or rebuilding and enlargement of ancient mansions that has taken place to meet the demands of modern fashion and luxury, which dispels the homely comforts of the last generation; or reckon up the vast sums that have been expended in building new and costly churches, or in what is popularly known as restoring old ones, and it will be felt that if modern architecture has missed the flood that ought to have got her adrift, she cannot complain of any want of opportunity. And yet the melancholy fact remains that at no period in the world's history has so much architecture been produced that is either positively good or else absolutely uninteresting. In the City of London there are whole streets of new banks and warehouses, built within the last few years, of costly materials and magnificent proportions, to many of which it is best to shut one's eyes altogether, while of the rest there is seldom one that is worth a moment's pause for observation. Those that are offensively bad are so from ignorance or contempt for the recognised rules of art; those that are merely dull and stupid result from the mere mechanical repetition of stock forms and stale ideas, which does duty for thought and saves the trouble of invention.

In these cases it is difficult to see who can be blamed but the architect for not making more of his opportunity. He seems to have had everything in his favour,—a palatial structure to erect, and *certe blanche* in his command. And, in the rare cases where buildings of this kind are entrusted to men who are artists, one sees readily enough what can be done with them. There is, perhaps, no class of building for which it is easier to produce an effective design, if the architect will but do his best and put his whole soul into it. But this is not the way in which it is generally done. It is no secret that the majority of architects now work in a very different way from this. The conditions of success, which I have lately stated, are inconsistent with the calls that are made upon their time by other matters. Comparatively few of their working hours are given to architecture; he rest are spent in employments that have nothing to do with it. Many of them fill the office of surveyor to corporations or public companies, and the best part of their time is spent in the survey of land, the valuation of ground-rents and of houses for lease, or for sale or purchase. Others occupy themselves in taking out the quantities for estimates of their own or other men's buildings, or else they sit on arbitrations, or devote themselves to building schemes, land companies, and to negotiating the sale or lease of buildings and building sites. These and similar occupations engross the greater part of their time, and must, from their nature, take precedence of anything else, and, consequently, only the leavings of their time can be given to architecture.

What can come of such a system but failure? Reflect for a moment on what has been said of the claims which architecture makes on the attention of the artist, how she demands his careful study of every detail, and the impression of his hand on every part, and then consider what kind of work is likely to be turned out in the odd half-hours of a life busily engaged in her pursuits. The result, of course, is that the buildings raised under these conditions, if not actually bad, are at best of that dull,

characterless kind which has little of the architect himself in it. How little it has in many cases the outside world has no notion, nor, I must confess, had I myself till lately. Overwhelmed with other work of a non-architectural kind, the nominal architect has no resource but to delegate his architecture to a subordinate. Ghosts haunt our art even more than that of the sculptor, as I will show you by a few instances. The first that occurs is that of a building on which one of the wealthiest of the City companies spent 30,000*l*. The work was one that offered architectural opportunities of the most delightful kind, enough to have inspired any architect who had a soul to do his best. But it was its fate to be entrusted, as always seems to be the rule in such a case, to the Surveyor of the Company, and he, full of the surveying work, after sketching the general plans to a small scale, made such further working drawings as were needed by the builder. I am told these working drawings were never seen at all by the nominal architect. Now, the ghost in this and similar cases may be a capable ghost, in which case it is clear that he would do much better work without a principal over his head; or, as is more common, he may be a mere mechanical draughtsman, incapable of adding anything from himself to the bare suggestions which are supplied to him. In either case a divided authorship such as this must prevent either of the persons concerned from working with any proper interest and spirit.

Take another and a still worse case. Two old churches were doomed to undergo restoration. The architect who was turned loose on them was absolutely incapable of making architectural designs, and he therefore employed a ghost,—in this case a draughtsman who had retired from the office of another architect. The whole of the working drawings, such as there were, were made by this gentleman, and the only thing really designed by the principal architect was the pulpit, which has since, I hear, been turned out of the church. If this is a fair example of the way in which many of the disastrous church restorations over which one has so often to mourn have been carried out, one cannot wonder at the havoc that has been wrought.

But many architects dispense even with such spiritual assistance as this. They invoke no ghosts to help them, but simply give general sketches, and leave the builder to get through the work as well as he can. If the builder applies to him for any particular instructions about the details of the work, the only answer he gets is, "Take it and do it, and don't bother me about it." In a building that cost 6,000*l*., the only working drawings furnished to the contractor were those of a cellar-door and a coal-shoot, and every other detailed drawing was made by the contractor himself, who did not even go through the form of showing them to the architect. In this case, too, the paymaster was a City Company, and the nominal architect was their Surveyor. I may add that the contractor's belief is that even the general plans were not the architect's own, but that he got someone to do them for him.

Another builder tells me that he himself made all the detail drawings for a house that cost 15,000*l*., merely sending them up for the architect to look at, and getting them back with little or no correction. The same was the case with another architect, when the contract was for a house that cost 30,000*l*. With this architect, I am told, this is invariably the way in which his work is done. One contractor, who knows what good work is, and has worked under architects of the right kind, tells me that from the majority of architects he gets no working drawings, never any full-size details, and, at the most, drawings to the scale of  $\frac{1}{4}$  in. to the foot, and very few of them. I may, perhaps, be forgiven if I add that he finds country architects the worst in this respect, because no one is more ready than I to acknowledge that there are many country architects who work as artists should, and whose work any of us might be proud to rival.

These instances may serve to show how the greater part of our modern architecture is produced, and from them it may be gathered with whom the fault lies that the general standard is not higher; whether, in short, it is fair to blame an unappreciative public or those architects who are so little worthy of the public confidence. There never was a time when more depended on the architect, and yet there never was a time

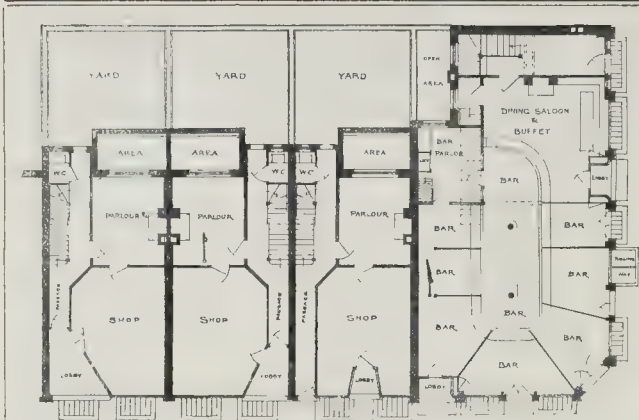
when architects produced so much careless and ignorant work. Things will never be better till it is recognised that Architecture and Surveying are two different pursuits, and that no man can succeed in both. How architecture suffers, I hope I have already shown clearly enough. Life is not long enough for the study of that alone, and has certainly no margin for another profession. It is not even as if they were kindred associations, for it is difficult to see that architecture has anything more to do with land-jobbing than it has with horse-coping. It is an ill-omened association that has produced nothing but harm, and an architect cannot but remember with resentment that, but for this, the name of the noblest of the arts would not have been dragged through the mud of the recent scandals of the Metropolitan Board. By their separation into two distinct pursuits both would gain, for if architecture suffers by the time subtracted for surveying work, it follows that the latter must suffer by the time taken up by architecture. Both are now ill-done. That it is so, in fact, is shown plainly enough by the complaints of the unfortunate builders who have to make estimates on quantities prepared by architects. What the builders think about them may be seen by what was said last week in a paper read by Mr. Ashby to the Institute of Builders. A contractor told me the other day that after beginning a work, for which the architect had supplied the quantities, he discovered that all the internal brickwork had been forgotten; and another contractor told me that he had long regarded tendering on architects' quantities as mere speculation.

The reform that it is my object to support to-day is, therefore, nothing more than what is conveyed in the old adage that the cobbler should stick to his last. I want nothing more than this, that architects should stick to their own craft, because they will find it more than enough to occupy all their time and all their energies, and because, unless they devote themselves to it entirely, they need never hope to do good work. This seems so obvious that one might think it was only necessary to state it in order to command assent; and yet among all the remedies and plans for improving architecture, it seems the very last that the majority of architects can be induced to accept. Candour must compel them to admit the truth of it if they could but be brought to face the question boldly, but they invariably shrink it, and hunt about for all kinds of far-fetched remedies and fanciful nostrums, while all the time the cure is actually in their own hands. Heroic treatment is now the fashion, and the latest and wildest idea is to call in the aid of the Legislature, and make architecture a close profession, like law and physic. Those who promote this scheme strangely mistake the conditions under which a fine art can exist and flourish; or more likely they are content to drop the fine art, and sink architecture into a respectable profession. The whole proposal is a mischievous chimera; architects cannot be made by Act of Parliament, nor can art be galvanised into life by a schedule. There is nothing but harm to be got from legislative interference, and the worst enemies of the progress of architecture are those who are now struggling to hush up architects, surveyors, and engineers into one mess, and make of them a single close profession, thus perpetuating the very mischief I have been complaining of. No system of examination and diploma can be framed to exclude bad architects. The men whose way of work I have condemned, together with their ghosts and all their following, would all of them pass the test with *éclat*, and take their place among the registered elect. The remedy does not lie in this direction. It lies with ourselves; it consists in the endeavour of each architect to make himself a true master craftsman, perfect in every department of his art; at home in every branch of constructive skill; expert in every branch of decorative appliance; with an eye trained to comprehend breadth and mass, and yet able to stoop to the care of the most delicate detail. It is thus that the great styles of the past were brought to the perfection which makes them worthy to be our models, and it is only thus that we can ever make our art worthy to succeed them.

Let us, therefore, put our own shoulders to the wheel, and cease crying on the Hercules of the Legislature to come and pull us out of the mire.

The Leamington Town Council has decided to discontinue street electric lighting.





The "Goat-in-Boots" Public-house, and adjoining Shops, Fulham-road, S.W.—Ground Plan.

### Illustrations.

#### THE EQUESTRIAN STATUE OF ÉTIENNE MARCEL.

**I**N 1882 the Municipal Council of Paris decided to erect a statue to Étienne Marcel in the garden which runs along the side of the Hôtel de Ville, facing the Quai.

A competition, in which seventy-four artists took part, was held the following year, and resulted in the selection of the design by M. Idrac, the son-in-law of the late eminent architect Ballu. M. Fremiet obtained the second prize, and M. Marqueste the third. Unhappily M. Idrac died shortly afterwards, when in the first promise of his artistic career, and M. Marqueste was chosen by his executors to complete his work, the casting of which was entrusted to the well-known firm of MM. Thiebaut frères.

The casting, in *one piece*, of this statue, which is four metres and a-half in height, gave rise to a warm dispute between the founders and M. Marqueste, who complained of the manner in which the work was done. The Municipal Council took up the question, and eventually MM. Thiebaut offered to execute the work again at their own cost, rather than allow the dispute to run on. This was accordingly done, and the statue was officially inaugurated in July last, on the day of the National Festival.

Messrs. Thiebaut, however, have reserved the right to exhibit this year, in the Champ de Mars, their first casting, in order that the public and the artists may judge for themselves how far the criticisms directed against their work were justified.

The statue now erected stands on a rectangular pedestal, a little too elevated, in our judgment, for the best effect. The principal face of the pedestal bears the following inscription—

La Ville de Paris,  
À ÉTIENNE MARCEL,  
Prévoit des Marchands,  
Mort en 1358.

The pedestal was designed by Ballu, and has been carried out so far under the direction of his son, M. Albert Ballu. It is not complete, however, as the original design included some bas-reliefs, the execution of which has been postponed from motives of economy.

#### "LA PAIX ARMÉE."

This statue was commissioned by the Municipality of Paris, in 1887, from M. Coutan, as the result of a competition in which two other sculptors, MM. Allar and Rouleau, were invited to take part. The figure, which stands four metres high, has been cast in a specially-prepared material, called "bronze Keller," at the foundry of MM. Thiebaut frères. It stands on a granite column about ten metres in height, erected under the direction of M. Paul Sédille, in the centre of the square d'Anvers.

The statue was unveiled on Sunday, the 4th of November last.

#### "RUSHOLME," CROCKHAM HILL, KENT.

This view shows some slight additions to a house built a few years ago on a very picturesque site about midway on the main road from Westerham to Edenbridge, commanding views of charming Kentish landscape.

The ground-storey walls will be built in rubble-coursed local stone; the upper part will be hung with red tiles in ornamental bands.

The roofs are also tiled and boarded.

The external timber-framing will be of English oak with rough cast panels.

The work is being carried out by Mr. Deadman, builder, of Crockham Hill. Mr. Arthur Ardron is the architect.

#### THE CHURCH OF ST. WDDYN, LLANWDDYN, N. WALES.

This church, recently erected by the Liverpool Water Committee, occupies a commanding position on high land to the right of the great embankment of the new Vyrnwy Lake as seen from the Llanfyllin-road. The church is finished externally with local stone walls, with dressings of Cefn stone to windows, buttresses, and belfry.

The style adopted is Early Pointed, with the exception of the south door, which is semi-Norman, protected by a massive oak porch with an inscription on the internal beams to the following effect: "This church of St. Wddyn was erected A.D. 1887; the old Church of St. John being covered by Lake Vyrnwy."

The interior arches, &c., are of Bath stone, which contrasts well with the red Ruabon bricks with which the whole of the interior walls are faced.

The roofs of the nave, aisle, and transepts are open to the ridges, with massive arched principals, collars, and ties, and moulded wall-plates. The choir and chancel have panelled ceilings, coved at sides, and with bold wood ribs and plaques. All the woodwork of roofs is stained a dark oak colour and varnished.

There are handsome dark oak screens to the transept arches, that on the north side enclosing vestry. The pulpit, choir-stalls, and reading-desk are all of dark oak, and the fronts of the choir-stalls are formed from old oak panelling taken from the gallery-front of the old Church of St. John, which is now demolished, with its surrounding village, to make room for the new Lake Vyrnwy.

The font and east gable cross from the old church are also used in the new building.

The seating is of varnished pitch pine; the floors of nave and aisle and transept are of solid wood-blocks, and that of choir and chancel of deep red and black tiles arranged in simple patterns. The windows are glazed in "cathedral-tinted" glass, with coloured margins.

The church is heated from a chamber below the vestry by means of a hot-air apparatus supplied by Messrs. Cooper, of Liverpool, ample provision being made for the admission of fresh air.

Seats are provided for 184 persons, including a choir of nineteen, and more accommodation

can be provided, if necessary, by extra seats or chairs.

The contractors for the whole of the works were Messrs. Hughes & Owen, of Wrexham, who have completed their contract in a creditable manner.

The oak-work was supplied by Messrs. Norbury & Paterson, of Liverpool, the tiled floors by Mr. Swift, and the plumbers' work of church and vicarage by Messrs. Haskayne & Kinsop, also of Liverpool.

The architect is Mr. Francis U. Holme, F.R.I.B.A., of the firm of Messrs. F. & G. Holme, Liverpool, and Mr. John Sadder, of Widnes, acted as clerk of the works.

#### THE "GOAT IN BOOTS" PUBLIC-HOUSE AND THREE HOUSES AND SHOPS.

This tavern was rebuilt a short time since, on part of the site of the old tavern, at the corner of Fulham-road and Park-walk, Chelsea (the three shops and houses covering the remainder of the old site), and comprises public and saloon bars on the ground floor, as shown on accompanying plan; billiard-room, with lavatory, &c.; two sitting-rooms and a bed-room on first floor; and bed-rooms and bath-room, &c., on the second and third floors.

The whole of the fittings in the bar are in mahogany, with walnut panel mouldings, and were supplied by Mr. Taylor of Chamberwell; all the upper panels of partitions and doors being filled with painted glass by Messrs. Campbell, Smith, & Co. The fronts are carried out in yellow bricks, with red brick and stone dressings; the pilasters on the ground floor being of red granite, with grey granite bases.

The old painted sign (which has a history) has been rehung on a wrought-iron bracket, and has also been copied in the carved stone panel, this, with the rest of the carving having been executed by Mr. Gilbert Seale. The works were carried out by Messrs. Turtle and Appleton, from the designs and under the superintendence of Mr. T. H. Smith, architect.

#### THE MANSIONS, SLOANE-GARDENS, LONDON, S.W.

This block of buildings, of which we give a view and plans in our issue to-day, is situated by the side of Sloane-square Station, at the corner of the two new roads formed since the recent extensive clearance of old property on Lord Cadogan's estate. So great a change has been made here that no one who last visited the district four or five years ago would know it. Narrow streets of squalid houses have given place to wide avenues of mansions. The main frontage of The Mansions is to Sloane-gardens, which is 80 ft. wide. In the side road are three shops, with housekeeper's residence. The building consists of basement and six other floors. Each upper floor forms a complete residence, consisting of large hall, two reception-rooms fitted with balconies, five bed and dining-rooms, bath-room, two water-closets, kitchen, and offices. There is a service lift from the tradesmen's entrance on the ground-floor, and a passenger-lift from the principal entrance in Sloane-gardens.

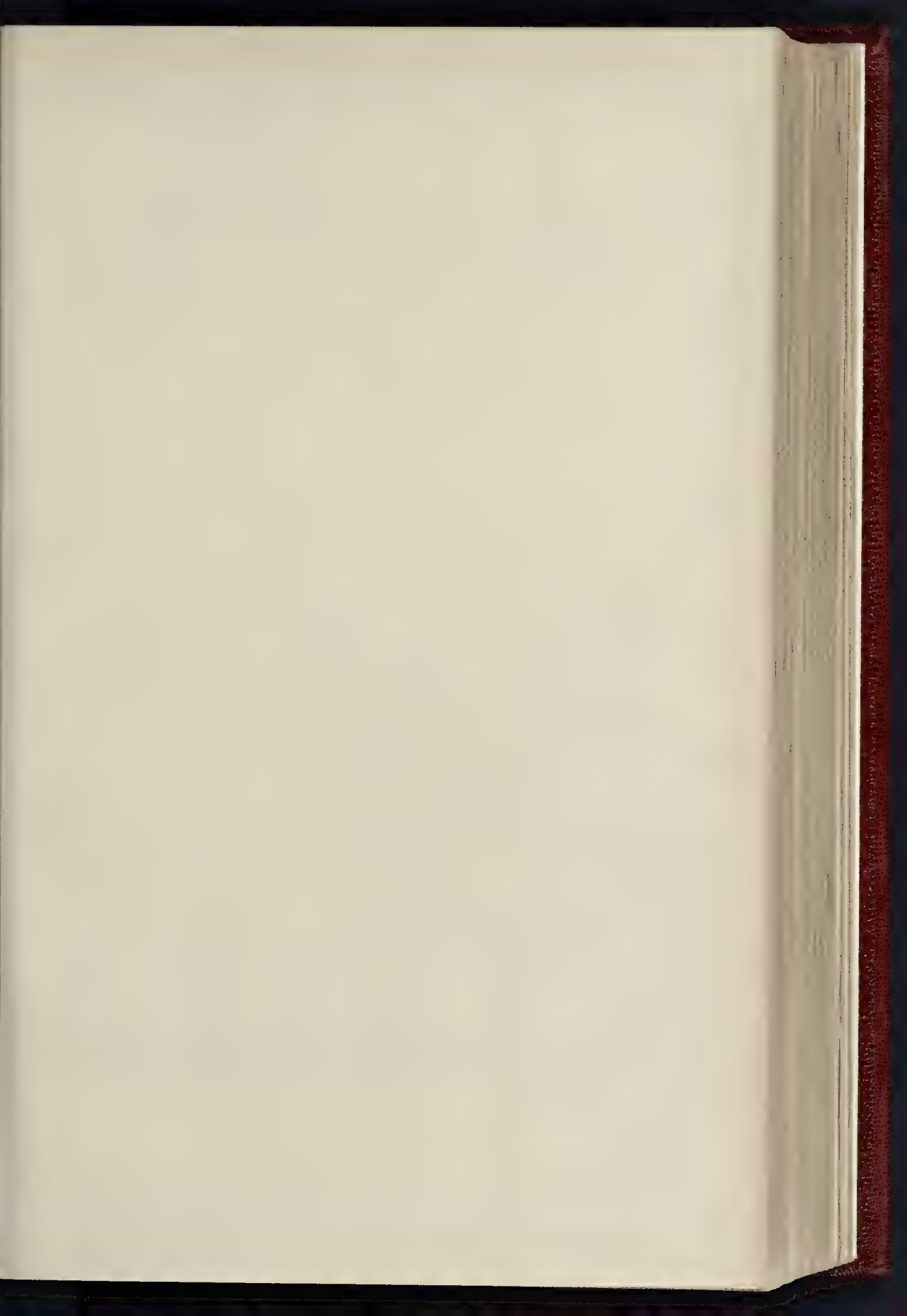
The building is of fireproof construction throughout, with a flat roof. Externally it is of red brick with stone dressings.

The contractors are Messrs. Langdale, Hallett, & Co., of 186, Brompton-road, S.W.; and the architect is Mr. Edwin T. Hall.

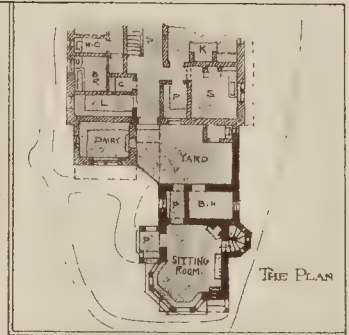
#### NEW PREMISES, CHELSEA.

The illustration shows the King's-road frontage of some premises erected during the last five or six years for Mr. Peter Jones, on land held under a long building lease direct from the Earl of Cadogan. The main fronts are built of red Mansfield stone and red Fareham bricks, and the roofs are covered with German green slates, and having lead dressings. The shops on the ground-floor behind the main buildings have open timber roofs of pitch-pine, the floors being constructed of iron and concrete, laid with teak or pitch-pine. The basements are lofty and light, in part used as show-rooms, and paved with oak blocks on concrete. The costume department, which is two stories high, surrounded by galleries, has been very elaborately fitted with walnut and ebony cases, decorated with carvings of natural foliage. The premises were among the first of their character to be lighted by electricity, when Messrs. Crompton supplied the installation, worked off

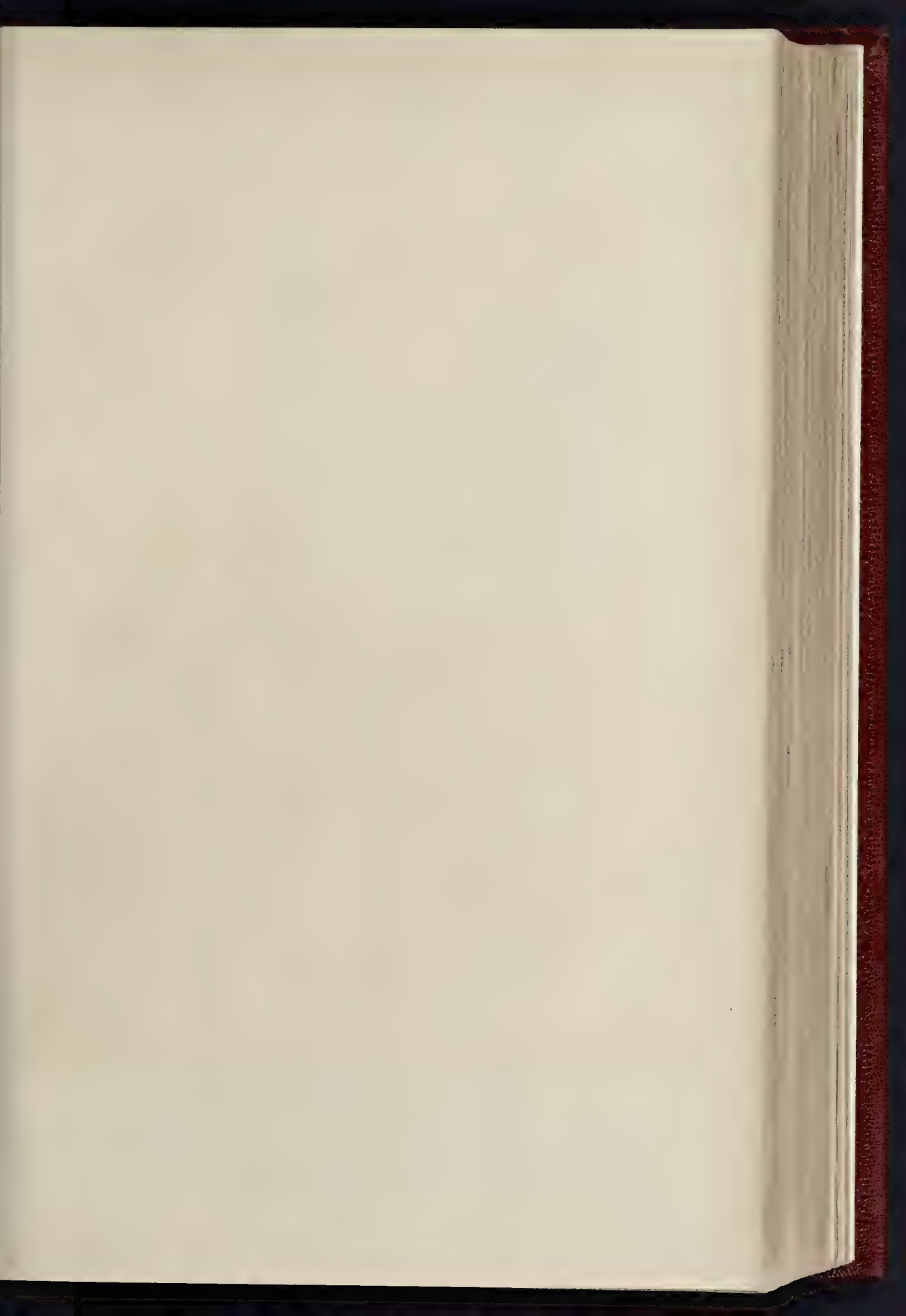




Additions to Rusholme.  
Crockham Hill: Kent:  
Arthur Ardron Archt.



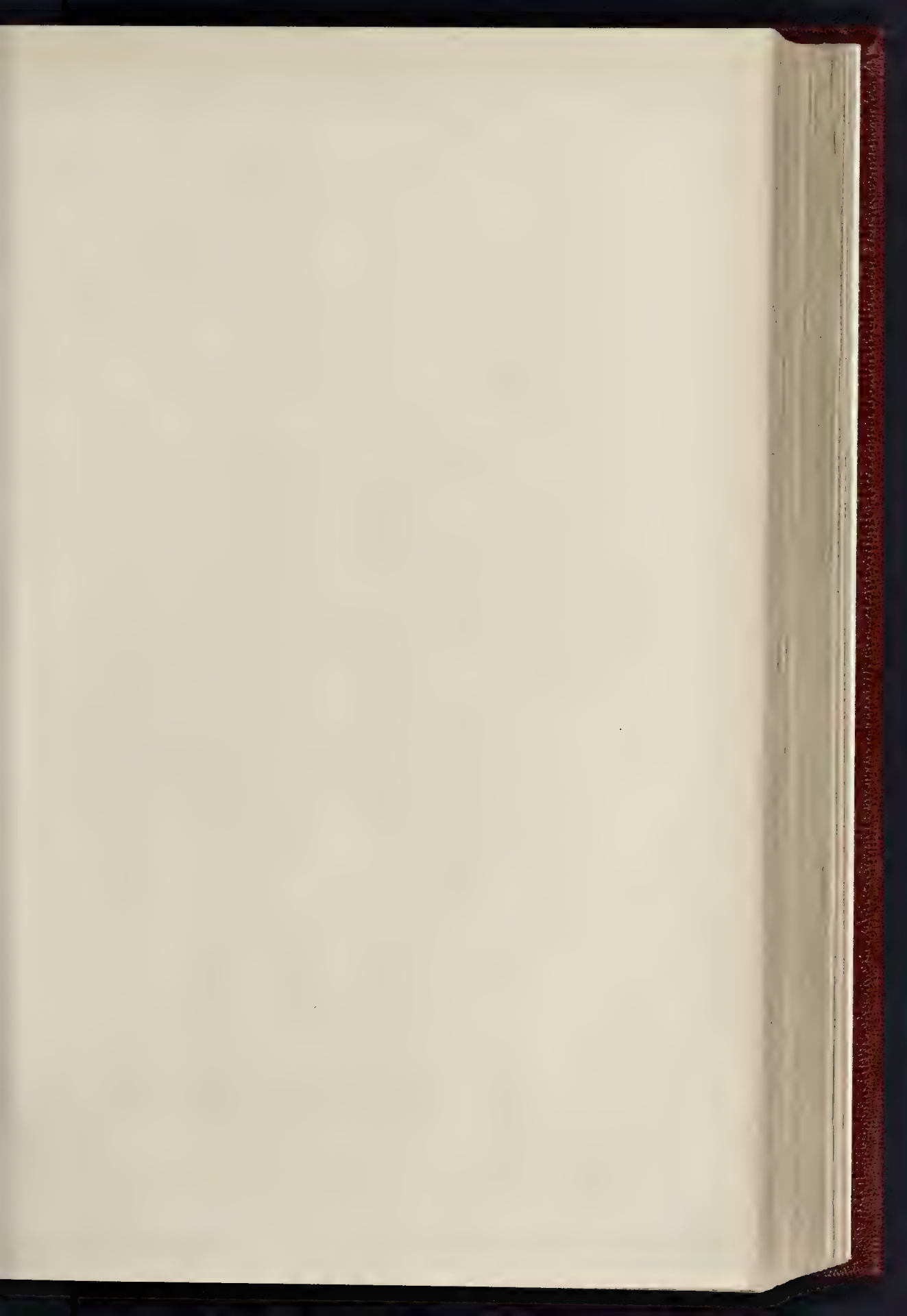




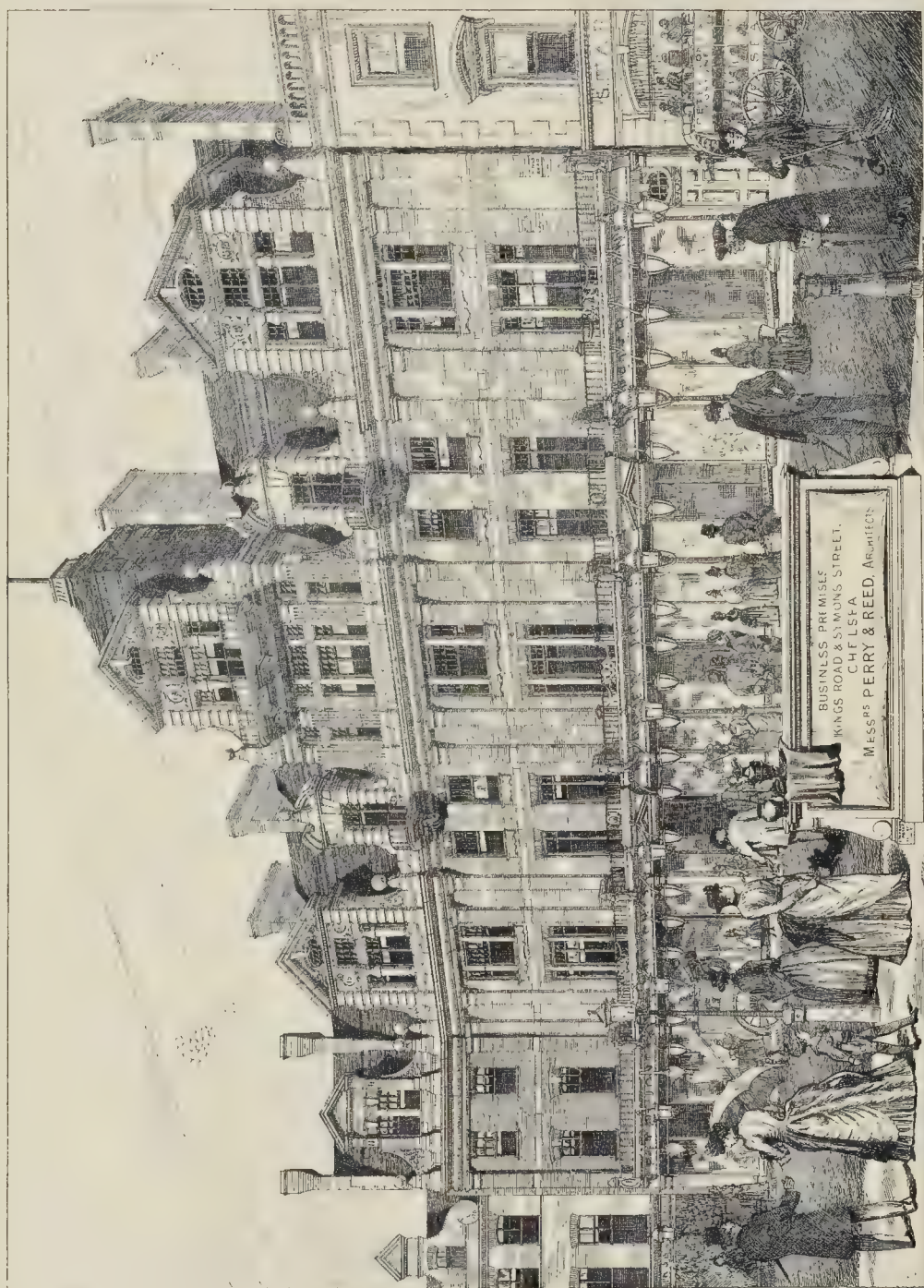


EQUESTRIAN STATUE OF ETIENNE MARCEL, PARIS—DESIGNED BY THE LATE M. IDRAC; CARRIED OUT BY M. MARQUESTE, SCULPTOR.

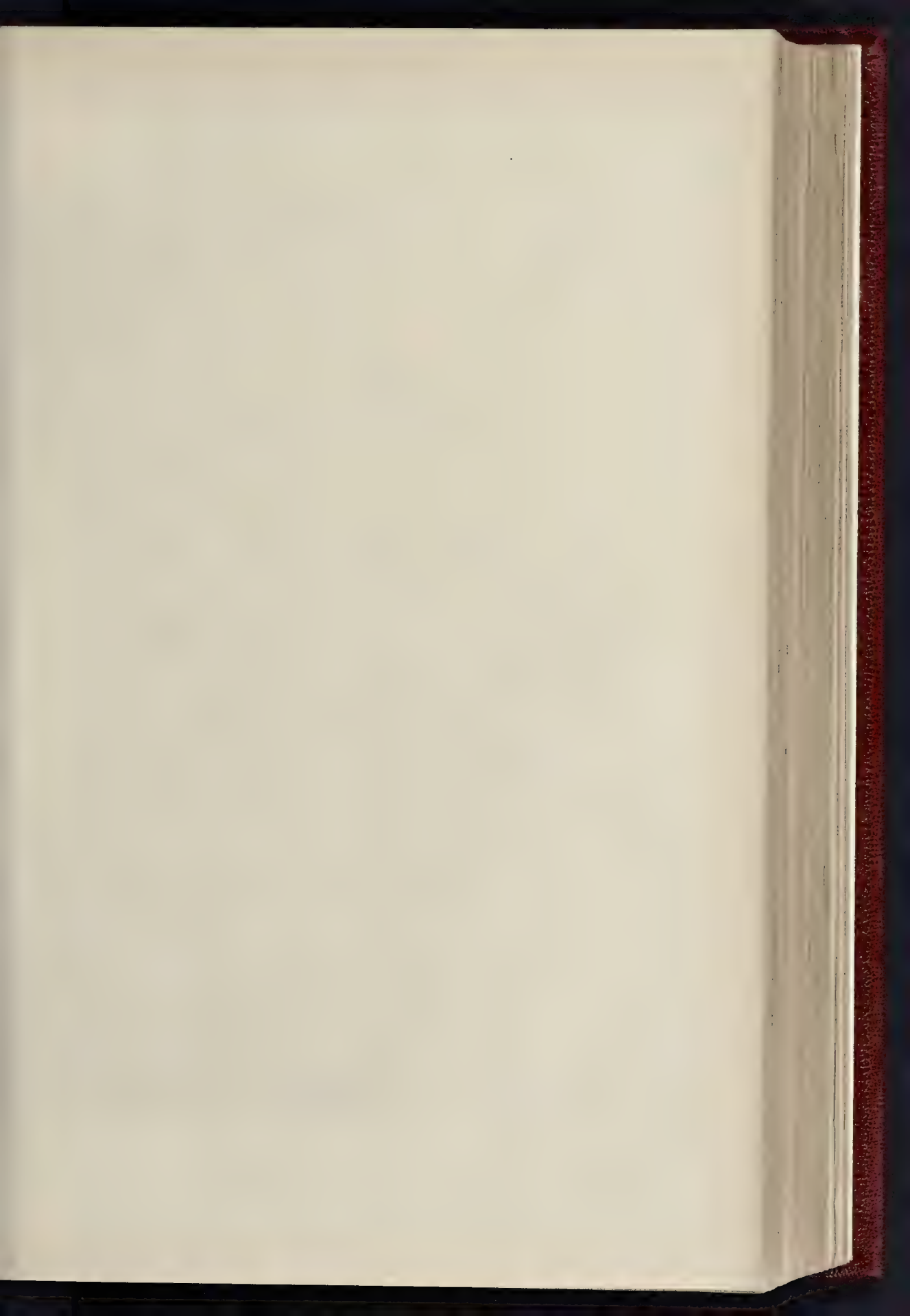




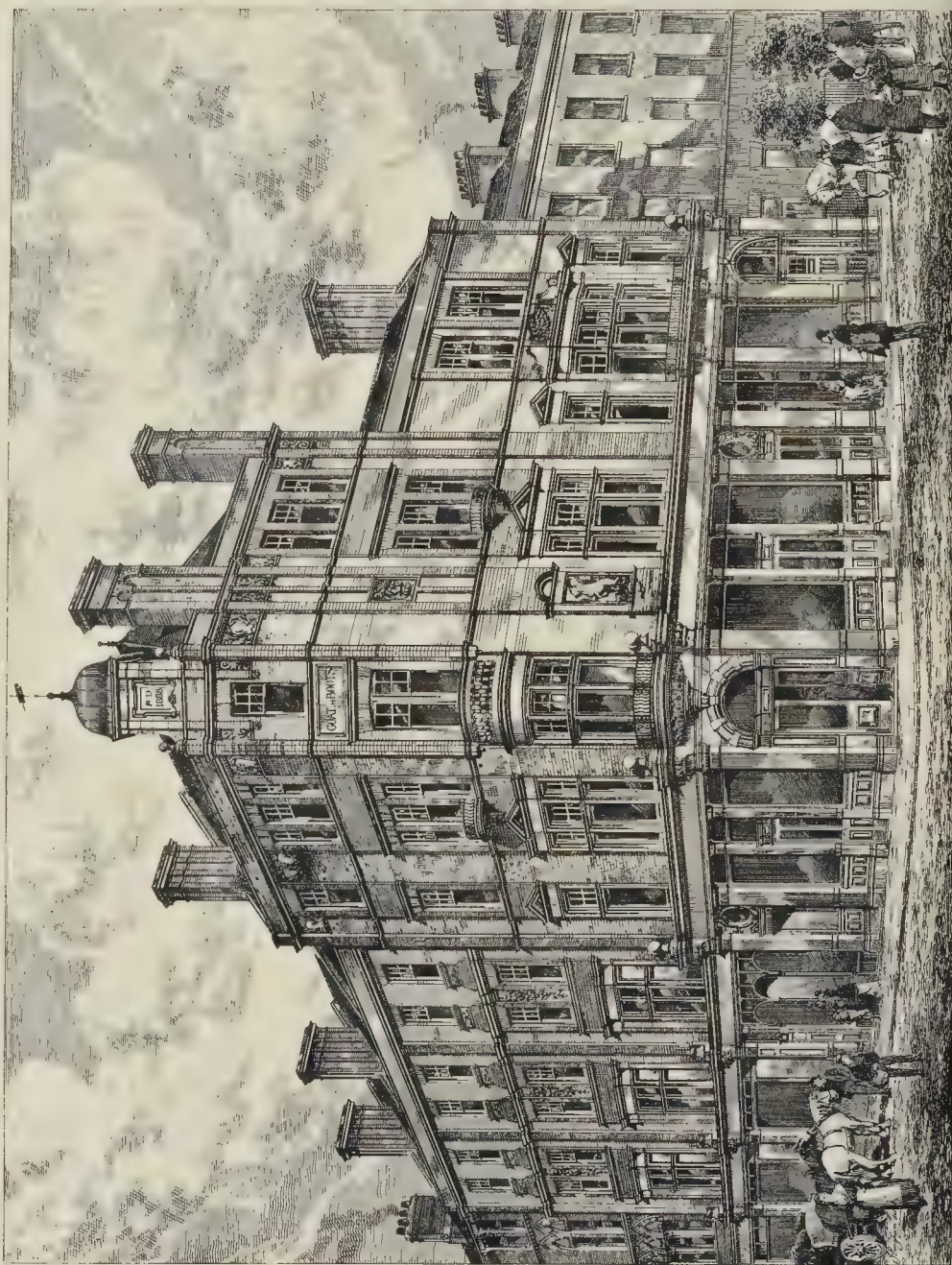
THE BUILDER, JANUARY 19, 1889.







THE BUILDER, JANUARY 19, 1889.







PLAN OF ENTRANCE FLOOR



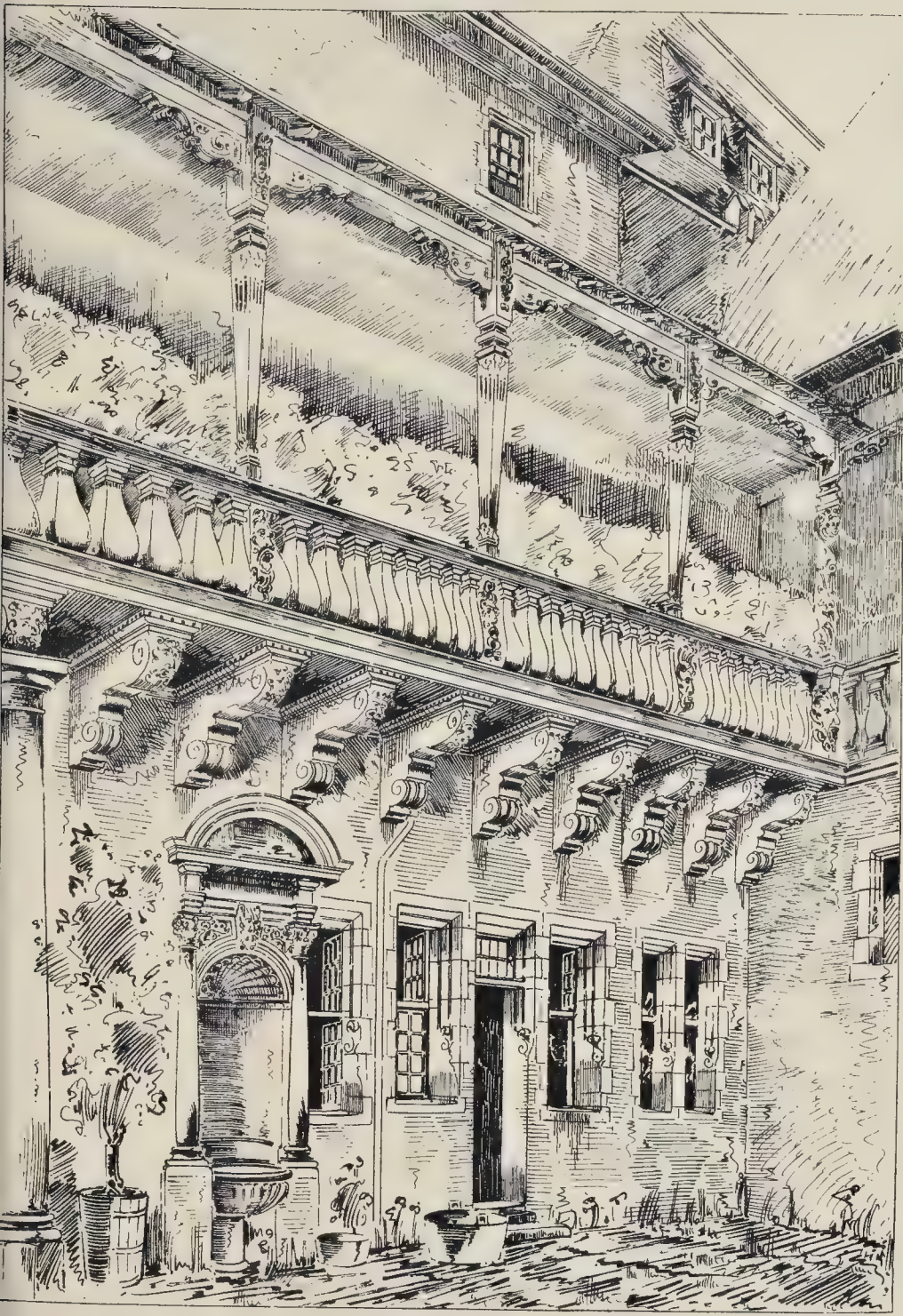
PLAN OF UPPER FLOOR



THE MANSIONS, SLOANE GARDENS, S.W.—MR. EDWIN T. HALL, F.R.I.B.A., ARCHITECT.







COURTYARD IN THE ENGLISCHER HOF, MAYENCE.—FROM A SKETCH BY MR. J. A. JONES.





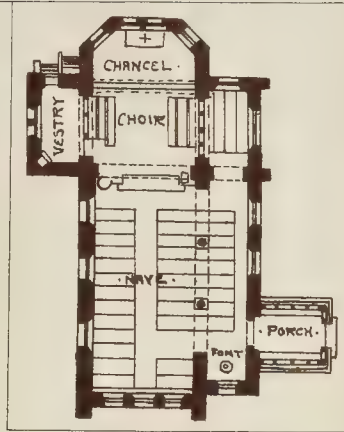


NA PHOTO SPREAD FOR 22 MARY ST. LANE GALLERY OF LONDON, E.C.

"LA PAIX ARMÉE:" STATUE ERECTED IN THE SQUARE D'ANVERS, PARIS -M. COUTAN, SCULPTOR.







PHOTOGRAPH BY MR. MARTIN LANE, CHURCH ST. WDDYN, N. WALES.

CHURCH OF S. WDDYN, N. WALES.—MR. F. U. HOLME, F.R.I.B.A., ARCHITECT.





two 16 h.p. gas-engines; but the whole of the shops are now lighted by incandescent lamps, supplied from a local centre.

The cost of the buildings and fittings, up to the present time, has amounted to over 50,000*l.*, and the works were executed in sections, the earlier contracts being carried out by Messrs. Clarke & Bracey, and the latter by Messrs. W. Brass & Son. The whole of the carving was executed by Messrs. Wyon & Stewart, the marble pavements by Messrs. Diospecker, the parquet floors by Messrs. Howard, the sanitary arrangements by Messrs. Crapper, under the superintendence of Professor Corfield; the scagliola by Messrs. Bellman & Ivey, and the cast-iron by the Cadogan Iron Works Company. The whole of the works, including the fittings, have been executed from the designs and under the superintendence of the architects, Messrs. Perry & Reed, who are now engaged on the drawings for considerable additions on the Symons-street front.

#### ENGLISCHER HOF, MAYENCE.

THIS interesting example of German Renaissance architecture, of which the plate reproduces a drawing, taken from the court-yard, is situated in the oldest part of the city of Mayence, and is entered from one of the narrow, tortuous streets which are characteristic of those centres which formed the busy haunts of men long centuries ago, before the invention of gunpowder caused the old town walls to give way to the modern system of fortification, allowing of its expansion into suburbs.

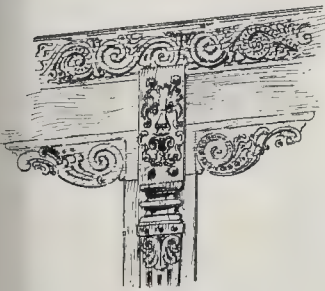
The house was originally the seat of a noble Rhenish family, the Counts of Spiegel, and, therefore, in the middle ages, was known as "Zum grossen Spiegel," and the arms show also a looking-glass (Spiegel) in addition to the other emblems quartered thereon.

The house was built 1562-1624, and it had much suffered by different wars, but was always repaired, and became a hotel in the beginning of the eighteenth century.

The old name was changed into "Zum König von England," on account of the stay of a King of England there for a few days—perhaps King George. Lübke, in his "History of the German Renaissance," mentions the building, and many architectural artists sit in the courtyard during the summer months making studies, &c., &c.

There were also some charming ceilings of wood, and doors, in the Renaissance style, but these were placed in the new palace built for the Grand Duke of Hesse Darmstadt, when he married the Princess Alice of England.

I may add that there still exist in several of the old sixteenth and seventeenth century houses in the neighbourhood most elaborate Renaissance ceilings, panelling, &c., such as are described as having formerly enriched this house.



Detail in Courtyard, Englischer Hof, Mayence.

The detail sketch herewith gives a better idea of the character of the wood work than can be gathered from the illustration.

J. A. JONES.

**The Sanitary Institute.**—At a meeting of the Council of this Institute, held at the Parkes Museum on the 9th inst., Mr. G. J. Symons, F.R.S., in the chair, it was decided to hold two courses of twelve lectures for sanitary officers, the first course to commence in March, and the second in October. Sixty-four Members and Associates were added to the register, and twenty applications read for election at the next meeting.

#### THE ARCHITECTURAL ASSOCIATION: LONDON STREET ARCHITECTURE.

THE PRESIDENT (Mr. H. D. Appleton), in inviting discussion on Mr. F. E. Masey's paper on "London Street Architecture as it is and as it might be" (which was printed *in extenso* in last week's *Builder*) referred to the excellence of the paper and the large amount of ground it covered. Whether it was altogether a students' paper he must leave the meeting to decide, and he hoped they would lay aside any natural diffidence they might have in criticising recent work. He was afraid that the appointment of an architect-inspector would have the effect of very much influencing the character of the design, and most men would be rather inclined to "cotton-up" to the particular style of the architect-inspector (laughter). The reason why terra-cotta was not more used at present was the extreme difficulty of getting it properly made (applause). Any one, too, who had experience of terra-cotta building, especially in London, would hesitate before employing it, simply on account of the harassing delay in getting it.

Mr. Thomas Blashill (Superintending Architect, Metropolitan Board of Works), in proposing a vote of thanks to Mr. Masey, remarked that any one who broached such a subject was entitled to their most hearty thanks, and although the chairman had thrown out some little doubt as to whether it was a students' paper, his own impression was that it was, and that none of the young members need be in the slightest degree backward in expressing their opinion upon it. His own recollection of London was longer than that of most of those he saw around him, for the first time he was in the City he walked over the ground on which Cannon-street was then about to be formed. That would be about 40 years ago, and he looked back with a considerable amount of satisfaction to what had since been done to London. London had not been pulled down and reconstructed, as had been the case with a great portion of Paris; but, taking Cannon-street as one of the first of the great new thoroughfares, it must be conceded that much good work had been done; while, apart from the construction of streets, a great deal of new building of a meritorious kind had taken place. People had been talking for years about improving London, and it would be a bad thing if nothing had been done; but people's views changed considerably in the course of time, and in another twenty years ideas would be very different to what they now were. First of all, they should appreciate the beauty of London more than they did (applause). Then, again, as architects, they should make themselves a little more responsible for what the profession had done. He well remembered Professor Donaldson, thirty years ago, mentioning to his class this very particular subject, and saying that after being five years abroad on the grand tour, when he again stood on Waterloo Bridge he was amazed at the beauty of Somerset House, as compared with many a foreign building standing in an infinitely better position. He (Mr. Blashill) would therefore ask his hearers to look at the matter in a hopeful spirit, and not suppose they were now only beginning upon something which was entirely ugly, for a good commencement had already been made. In referring to foreign cities, he would be inclined to look a little further afield than the lecturer had done, and he knew of no city where there were such good examples to be found, he would not say of the very highest style of art, but of a good general style. The worst thing about London, which spoiled everybody's work, was the dirt on the buildings. No doubt that was due to the smoke, but it should also be remembered that people never washed their buildings (laughter). The remark seemed to create amusement, and possibly every member present had not heard of public buildings being washed, but a great many of the buildings which were at one time praised were now considered ugly merely because they were black. In any continental city of ordinary importance, the proprietor or occupier of a building was compelled to clean it outwardly about every ten years. In London, on the contrary, houses constructed of the finest and most costly materials were left untouched for ten, twenty, or thirty years, by anybody except the painters. That was the ruin of all work, and no one could be expected to admire architecture when it was kept in a state of dirt. In Holland the houses outside were washed every week. Mr. Masey had made the im-

portant suggestion that a public official, with, of course, a proper means of appeal, should have control over public buildings. He did not know that he (Mr. Blashill) was the proper person to defend anything of the kind, and he was not sure that he should; but, at any rate, if that was considered to be a good thing by the profession and the public generally, the power given should be strictly limited. Because what would have been said in years gone by, had any one proposed to erect an important public building in what was termed the Gothic style? Why, no official would have dared to give the necessary leave, and the first instance of a change in style would never have begun. The powers to be conferred would, therefore, have to be limited, as Mr. Masey had rather hinted, to some low standard. The question of who was to design the public and private buildings was an important one,—whether highly-educated architects were to do it, or whether things were to be left to take their chance. If they looked from one ten years' end to another, they would find the design of those who were considered the best architects permeating a far lower scale of designers. He did not know any city, of any time or country, where the general tone of the buildings was that of great beauty; one had to look for the extraordinary examples, and would have to do so to the end of the chapter. The education of the architect, and the limitation of the profession, were serious matters, which would have to be very carefully considered. He had this subject, which was one of importance, very much at heart, and he personally had great hope that there would be an increasing amount of good building done, and that, with the better materials used, the progress in the future would be rather more rapid than had been the case in the past (applause).

Mr. J. M. Brydon seconded the vote of thanks, and spoke of the greatness of the subject. The general street architecture of London, he considered, was frequently very bad indeed. A great deal of new work had been done in London recently, and new thoroughfares had been driven through different parts in a haphazard sort of way. Cannon-street was one of the best examples, but he could not say much for Shaftesbury-avenue and Charing-cross-road, when he thought of what might have been done. Those two streets seemed to begin and end nowhere, and to be designed without the slightest idea of any such thing as a vista. Charing-cross-road was a deplorably narrow street, considering that it was the main thoroughfare from north to south in that part of the town. As to the architecture of the London streets, no doubt there were many admirable buildings; but what he complained of was the dead level of mediocrity, which never attained even to what might be called "respectable Classic." They were sometimes told that it was all a matter of taste, but he considered it rather a matter of knowledge, and Mr. Masey had touched the right string when he referred to its being greatly a matter of education. The educational advantages now put in the way of young men and students, both in London and the provinces, could not fail to bring forth good fruit, so that architecture would eventually be designed with greater knowledge, and therefore be better. Somerset House was undoubtedly a scholarly work, and anyone looking at it would see at once that the man who designed it was first of all a scholar. Nowadays, however, there was much half-and-half Classic work done, and it could be seen that the designers had little knowledge of what they were attempting to do. Somerset House, however, was eminently the work, not only of an artist, but also of a scholar, and in spite of all that had since been done, it still remained one of the finest buildings in London (applause). By way of contrast, he considered London a far more interesting city than Paris. At the first visit, Paris was very striking, with its long streets and the height and grandeur of its houses; but it became very flat and stale after a month's stay. London, on the other hand, had a picturesqueness which was one of its strongest points, the streets having a personal interest which those of scarcely any other capital possessed. He was inclined to think that Portland stone and brick were about the best building materials for London, the former getting that silvery-white tint which was so charming in nearly every condition of the atmosphere. That being so, he did not think that terra-cotta was to be lightly taken up. Even in the case of the Constitutional Club, with its clever design, the work was not



good enough. The highest class of workmanship could not be attained in terra-cotta; the whole thing had a sort of cast-iron appearance, and compared badly with what could be done in honest stone or brick (applause).

Mr. Francis Hooper said he thought that the position and influence of architects in England would be greatly enhanced by the increased attention now given to their education, and the opportunities afforded of discussing the architectural problems of the day. There was much to be learnt from what the Parisians had done in the distribution of their thoroughfares, monuments, and public buildings, but there was a great monotony and want of interest in the streets of Paris, which was positively tiresome; they should therefore strive to avoid the mistakes which the Parisians had made in allowing their new streets to be so flat and monotonous. With regard to dirt, there was a great deal of good architecture in London, which, if it could only be seen as the architect intended, would be admired immensely. The effect of colour in architecture could not be disregarded, whether in the details of the construction or the variation of material. In Paris, according to the By-laws, every façade must be cleaned down once in ten years, and, in order to secure uniform action, two of the twenty divisions of the city are scheduled annually, so that both sides of the streets have the houses cleaned down within twelve months. In London, architects, when rebuilding premises in narrow streets, may sometimes take steps for setting back the façade to give greater width to the thoroughfare, inviting the authorities to purchase the land given up, and if this was generally done the narrow streets would gradually disappear, as in Paris. Architects nowadays possess facilities which their forefathers did not, in the use of glazed brick, light iron construction, and plate-glass, and with improved means for lighting and ventilating, they could deal much better with cramped sites.

Mr. E. Doran Webb said he thought Londoners should be grateful to the dirt and fog, which rendered so many plain buildings picturesque, and brought out mouldings which otherwise would never have been noticed (laughter).

Mr. C. H. Brodie said he could not agree that the fog was in any way a blessing to London, though architects and builders of houses might at some future date help to get rid of the nuisance.

Mr. W. H. Atkin Berry said he was thoroughly tired of hearing Paris set up as an example for London, all the conditions affecting building in the two cities being so essentially different. One of the most discouraging facts to the London architect was that the public knew little of what constituted architecture, and cared less. All they cared for was to get the greatest amount of utility in return for their money, and they did not appreciate dignity or style. Terra-cotta might be adaptable to the atmosphere and climate of London, but one great disadvantage was in the delay incurred by its use; all who had experience of it knew that the bricklayers were always ahead of the terra-cotta people. With regard to the cleaning-down of buildings, he believed more attention would be paid to that in the near future. The effect of dirt and that of time were very different: the latter was beautiful, the former only destructive, both to fabric and colour. He infinitely preferred the general effect of London to that of Paris (applause). The effect of Paris was monotonous, whereas that of London was varied and picturesque. For instance, the view up Ludgate-hill could not be surpassed for effect, while Cheapside was picturesque in all weathers (except fog), and, whether looked at from east or west. Then, again, any one who would look towards London from any of the western bridges of the Thames, say Vauxhall Bridge, especially at sunset, would acknowledge that the effect was magnificent and could not be surpassed in any Continental city (cheers).

The Chairman added that the Fishmongers' Hall was washed down every year, and the result was extremely good. It was built of Portland stone, which, when washed, looked very much like marble.

The vote of thanks was then put, and carried by acclamation.

Mr. Masey returned thanks, and said that his object in writing the paper was to promote discussion. The successful use of terra-cotta largely depended on the architect and the manufacturer he got hold of. He did not know anything more beautiful than Portland stone and red brick; but excellent examples of the

use of terra-cotta could be seen,—as in Mr. Collett's buildings in Oxford-street, for instance.

The Class of Construction of the Architectural Association paid a visit to the works and manufacturing of Messrs. Sage & Co., shopfitters and workers in wood, Gray's Inn-road, W.C., on Thursday, the 10th inst. The visitors were conducted over the works by the senior partner of the firm, Mr. F. Sage, and were greatly interested by the many ingenious devices that were adopted for saving labour. At the conclusion of the visit a vote of thanks was proposed to Mr. Sage for his great kindness by Mr. Owen Fleming, the Secretary of the Class, and carried by acclamation, and the visitors departed, having spent a most pleasant and profitable afternoon.

The "A. A. Lyric Club" held a very successful smoking concert at Anderson's Hotel, Fleet-street, on the 10th inst. Mr. G. Richards Julian in the chair. The A. A. Lyric Club affords evidence that the members of the Association are as ready to combine for mutual entertainment as for mutual instruction, and the amount of latent musical and elocutionary "talent" which the starting of the Club has evoked is very noteworthy. The programme on the 10th inst. was, with the exception of Mr. Middleton's humorous songs, which were cleverly rendered, wholly sustained by members of the Club. Messrs. Bulmer Booth, W. Sirr, G. A. Pronst, Owen Fleming, H. Tanner, E. W. Knight, H. Irmrick, — White, — Ward, Lidstone, Pearce, W. E. Johnson, and the Chairman took part in the programme, Mr. Blanchard being an efficient accompanist.

#### OBITUARY.

Sir H. A. Hunt.—We regret to learn that Sir Henry Arthur Hunt, C.B., died at his residence, The Lees, Folkestone, on Sunday. He was a son of Mr. James Hunt, of Westminster, and was born in 1810. He was a partner in the firm of Hunt, Stephenson, & Jones, the surveyors, and had been Consulting Surveyor to her Majesty's Office of Works, and Receiver-General for the Dean and Chapter of Westminster. He received his knighthood in July, 1876. He had been a Fellow of the Surveyors' Institution since 1868.

Mr. — Clarke, Architect.—The *Glasgow Herald* of the 11th inst. mentions the death of Mr. Clarke, of the firm of Clarke & Bell, architects. He was a native of Ayr, and served his apprenticeship with Mr. Burn (afterly Burn & Bryce), of Edinburgh. In Mr. Burn's office one of his fellow-draftsmen was Mr. Bell,—who had been some time in the office of Mr. Elliott, architect of the Royal Bank, Glasgow,—and when, nearly half-a-century ago, the designing of the County Buildings and Merchants' House was submitted to competition, Mr. Clarke and Mr. Bell jointly entered as competitors, and, being successful, were employed to carry out the works. A condition of the competition was that each of the buildings was to have its individuality, but that together they should be in harmony. By the happy accomplishment of this (says the *Herald*)—although the one is Ionic and the other Corinthian,—but perhaps more by the justness of the proportion and the dignity of the composition, the young and hitherto unheard-of firm at once attained a place in the foremost rank of Scottish architects. It established itself in Glasgow, and shortly was engaged on such important works as Barnhill Poorhouse, and the conversion of the Jail into Courts of Justice. Among other buildings from its designs are business premises at the corners of West Nile and Renfield-streets, and St. Vincent-street, the Fish Market, with its very different, yet respectively characteristic, elevations towards Great Clyde-street and Bridgegate, the Kelvin-side and the Paisley Municipal Buildings, several terraces in the West-end, and many country mansions. Mr. Clarke took an active part in the Architectural Institute of Scotland, and was one of the promoters of the Exhibition of Architecture and the accessory arts that was held some years ago in Bath-street.

#### THE LATE MR. E. N. CLIFTON.

THIS gentleman, whose death was briefly announced in our last, was the third and last surviving son of the late Dr. Nathaniel Clifton, of Cross-street, Islington, and was born in Islington on May 24, 1817. He was educated

at the Charter-house School as a day boarder, under the late Dr. Russell, leaving in 1834, and commencing his professional career in the office of the late William Inwood as an articled pupil. During the time he served his articles he was engaged upon the drawings and works in connexion with the new St. Pancras Church in the Euston-road, and also upon other works carried out by the late Mr. Inwood. At the termination of his articles he remained with Mr. Inwood until 1837, when he was twenty years of age, and in this year, as joint architect with Mr. Inwood, he carried out the works in connexion with the erection of St. James's Church and St. Stephen's Church, Islington. In the following year he commenced independent practise as architect and surveyor in Tokenhouse-yard, and about the same time obtained the appointment of District Surveyor of Bethnal Green, at that time one of the largest districts in the metropolis—it having been since divided into two districts. From this date his practise steadily increased, and in 1845 (the railway year) and subsequent years during the railway mania, he made surveys and valuations for various lines of railway, and from this time it may be said his successful career commenced, and he became rapidly known as an architect and surveyor. About the year 1850 he carried out the large and important work in the building of the Royal Medical Benevolent College, Epsom, founded by the late John Lumsden Probert, whose eldest daughter he married in 1852, at which time he removed his office to his private residence in Russell-place, Fitzroy-square. His City practice, however, rapidly increasing, he found it necessary to return to the City, and took temporary offices in the old Excise Office, Old Broad-street, and, having at this time become associated with the late Sir (then Mr.) William Tite, carried out the negotiations for the purchase of that property—of which he was appointed architect. The large building now known as Gresham House was carried out by him, and covers over an acre of land, and it has proved a very successful speculation. During his connexion with Sir William Tite he removed his offices to St. Helen's-place, Bishopsgate-street, into the house where Sir William Tite carried on his practice. Soon after this the Old East India House in Leadenhall-street was for sale, and he was empowered by a syndicate to negotiate with the Government for its purchase. The old premises were demolished, and the present buildings, known as the East India House Estate, were erected, Mr. Clifton being employed as architect. These buildings cover over an acre and a quarter of land. For many years he has held appointment of Surveyor to the Liverpool and London and Globe Insurance Company, the London and Westminster Bank, the Worshipful Company of Tallow Chandlers, the London and Blackwall Railway Company, the East London Railway Company, the London and South-Western Railway Company, the Governors of the Charities of St. Dunstan in the East, also to the Parish of St. Dunstan in the East, and other smaller appointments. About the year 1875 he was appointed architect to the Holborn Viaduct Land Company, which was formed for building upon the lands the property of the Corporation of the City of London on the Viaduct, in Farringdon-road, Charterhouse-street, Shoe-lane, and Snow-hill. The whole of this important work, embracing between three and four acres of land, is now covered with buildings. He was very largely engaged in arbitrations, valuations, and compensation cases, and purchasing properties connected with the leading railway companies, waterways and various improvements made by her Majesty's Office of Works, the Metropolitan Board of Works, Commissions of Sewers, Corporation of London, School Board for London, H.M. Post-office, and other public bodies and institutions. He was a Fellow of the Royal Institute of British Architects, a Fellow of the Surveyors' Institution, Member of the Council and past President of same, and also an Associate of the Institution of Civil Engineers. He was frequently appointed as umpire in large and important valuation cases, and his opinion in light and air cases, and questions relating to the Building Act, was considered by many to be second to none. During the last fifteen years of his life he has been a great sufferer from chronic asthma, brought on, and in a great measure due to an accident he met with while riding in Hyde Park in 1874.

Among the various buildings erected by Mr. Clifton, those of the greatest importance



are:—The Royal Medical Benevolent College, Epsom; Gresham House, Old Broad-street; the buildings of the East India House Estate Company in Leadenhall and Lime-streets; the London Dock House, Leadenhall-street; Messrs. Mann, Crossman, & Co.'s Brewery, Mile-end; the National Bank, Old Broad-street; Alliance Bank, Borough; additions to the London and Westminster Bank, Lothbury; new branches for the same at Lambeth, Whitechapel, and Southwark; the "Swan with Two Necks," and Messrs. T. Tapling & Co.'s vast expanse of buildings, in Gresham-street; Bishopsgate Schools, Skinner-street; Middle-class Schools, Cowper-street, E.C.; the City and Guilds of London Technical College, Finsbury; the large block of buildings comprising Norfolk-terrace, Bayswater; also a large block of buildings in Westbourne-grove; and various alterations and additions to houses in the West End, and numerous other buildings in the City of London and elsewhere, including several warehouses and wharves.

Amongst the various works carried out by Mr. Clifton in the country may be mentioned the following:—Numerous railway stations on the Yeovil and Exeter Branch of the London and South-Western Railway; St. Dunstan's College, Catford Bridge, Kent; schools and chapel at Plaistow, Essex; the Imperial Hotel, Torquay; Clayton Court, Liss, Hants; also a large block of buildings comprising one side of London-street, Folkestone; and residences in various parts of the country.

Some years ago Mr. Clifton took into partnership his eldest son, Mr. William Edward Clifton; also Mr. William Elliot Hope, who for upwards of thirty years had been associated with him in his profession, the name of the firm being E. N. Clifton, Son, & Hope.

Mr. Charles J. Shoppee writes:—

"Mr. Clifton's loss will long be felt in the profession of which he was one of the most distinguished members. His great practical knowledge enabled him to deal with the most important questions, and his extensive practice and sound judgment well qualified him for the position of arbitrator and umpire to which he was so often appointed. Mr. Clifton's integrity was unimpeachable, and he has left an honoured name, which will long be remembered by his confidants."

Mr. Edward H. Burnell writes to the same effect, after a knowledge of Mr. Clifton extending over a period of more than forty years.

#### ARCHITECTURAL SOCIETIES.

*Edinburgh Architectural Association.*—This Association met in the Architectural Hall, George-street, on the 10th inst., Professor Baldwin Brown, President, in the chair. Before proceeding to the regular business before the meeting, the chairman referred to the loss the Association had sustained in the death of Mr. James Gordon, which was mentioned in our last, p. 34. Alluding to the deceased's professional ability, the speaker said it must have struck all who came in contact with him how thoroughly Mr. Gordon was an artist. The artistic community of Edinburgh, he thought, had lost greatly by his untimely death. It was remitted to the President and the secretary to draw up a minute of condolence with the deceased's family, and sympathy with Mr. and Mrs. Blane—the former the partner of Mr. Gordon. Mr. James MacLaren, of Dundee, contributed an interesting paper on "Ecclesiastical Remains in Scotland." After glancing at the historical conditions under which the ecclesiastical edifices of Scotland arose, and the place they held in the grand development of Gothic art in Western Europe, the lecturer followed a chronological order in the illustrations. Beginning with the "Round Towers" of Abernethy and Brechin, of the square form of which St. Rule's at St. Andrews is so perfect a type, he showed how these were distinctly of Eastern origin, the masonry, the ornament where it occurred upon them or upon the so-called Celtic crosses, and in the pages of the earliest Irish manuscripts, being distinctly Byzantine, and showing the survival of pagan symbols. After dealing with Iona and the Culdees, Mr. MacLaren took up the Norman period, which was illustrated by Leuchars Church, Dundfermline, Kirkwall, Jedburgh, &c. The Transitional period was represented by Arbroath. The Early English or Lancet style appeared in many examples—Dundrennan, Elgin, Plusscardine, St. Andrews, and Glasgow, the longest, though not the largest, of Scottish cathedral churches, and in many respects the most unique, its crypt being certainly the finest.

"This building was illustrated in the *Builder* April 21, 1888."

in Britain, if not in Europe. In the succeeding style, known as the Decorated, the lecturer had wealth of illustrations—Paisley, Cambuskenneth, Sweetheart, Lincluden, Holyrood, St. Giles, St. Monans, Dundee, Haddington, and Dundeld. Melrose, the best known of Scottish architectural remains, was late in character, and although distinguished by richness and beauty in details, was not, the lecturer thought, well designed in plan, while as a whole it lacked the stately splendour of Elgin, the massive grandeur of Glasgow, or the broad treatment and superb proportion of Arbroath. With a description of Roslin Chapel, the latest of Scottish Gothic edifices, the lecturer closed an interesting review of the ecclesiastical antiquities of Scotland, which was rendered doubly attractive by forty fine-light illustrations.

*Glasgow Architectural Association.*—The usual monthly meeting was held in the rooms on the 8th inst.,—the President, Mr. John Keppie, in the chair,—when a paper on "Greek Ornament" was read by Mr. William M.G. Petrie. The development of true principles of design and of many of the actual forms found in Greek architecture and its accessories, from Egyptian and Assyrian sources, was shown by numerous examples. At first symbolism ruled in the choice of ornament, but with the Greeks the abstract beauty of the type alone was the quality which guided them in their selection. The extent to which conventionalisation,—an abstraction,—was carried by the Greeks was a most interesting study, and upon this question much divergence of practice was seen in other styles, whether Classic, Mediæval, or Renaissance. From a study of these some general rules were established, and these were considered at length. Colour and ornamental figure-work,—in the friezes,—was briefly touched upon, and with the other subjects of the paper illustrated by a number of careful drawings prepared by the essayist.

#### THE PLUMBERS' COMPANY.

On the 10th inst., the Court of the Worshipful Company of Plumbers entertained the members of the Registration Committee at dinner in the City Chamber, Cannon-street Hotel.

The Master, in proposing "The Registration Committee," said that the meetings of the Committee were always attended by a large number of practical working plumbers,—men who had their daily bread to earn; several were accustomed to teach, and had been trained to habits of close observation. These men could not afford to come there merely for the purpose of passing away the time, and their presence there was the most conclusive proof that they were satisfied with the movement and with the manner in which it was being carried out. The value of the services of practical men such as these was beyond computation.

Mr. P. J. Davies, Master Plumber, said the men who were really plumbers desired that practical examinations should be made compulsory in all districts.

Mr. J. C. Ashdown, in responding, said that while the work of the examiners was undoubtedly onerous, they did not grudge their labour, for they felt the object in view was worthy of their best efforts.

Mr. W. Digby Seymour, Q.C. (Renter Warden), in proposing "The Examiners," said that these experienced and practical plumbers, who were devoting a part of their time to the work of the examinations, were doing a twofold service,—they were assisting in the improvement of their craft, and as the same time adding guarantees for the public health. Not being a plumber, he could not profess to criticise the examinations, but he knew sufficient of the matter to be satisfied that the examiners did their duty, and did it impartially.

Mr. J. Hume, Master Plumber, proposed "The Metropolitan and Provincial Plumbers." He referred to the rapid spread of the movement, and mentioned that he had a brother in Edinburgh who was as enthusiastic for the cause as himself.

Mr. D. Emptage, Master Plumber, Margate, said he was glad to hear that the Company were organising local committees. Many plumbers who were anxious to join the movement were prevented from coming to London, and local organisations were necessary to enable them to become registered. He thought the Plumbers' Company were very wise to communicate with the local authorities. If the local bodies took the matter up and talked it over, that would call the attention of the plumbers in the various counties to it, and so by degrees the system would become universal.

Mr. L. F. Gilbert, Operative Plumber, the London representative of the United Operative Plumbers' Association of Great Britain, recommended the formation of local committees of plumbers to organise the registration system throughout London.

Mr. J. W. Clave, Foreman Plumber, dealt with

"Technical Classes for Plumbers." He referred to the large percentage of applicants at the plumbers' examinations who failed to pass, and said that fact

was strong evidence of the want of higher training. Plumbers were better workmen than their forefathers, but they were not content to stand still on that account. Plumbers wanted to use their brains. He did not like labour for labour's sake, but for the good which it accomplished. He did not believe in "banging-up" a piece of work in half an hour, and then taking another half hour to efface the marks caused by reckless haste. He would rather spend three-quarters of an hour in doing the work properly. He believed technical education taught men to economise time and labour. But technical education would not do alone. It must be combined with workshop practice. In the plumbers' classes which were established by the Plumbers' Company these two things were combined. Those classes were not intended to teach a complete trade to any one having no previous knowledge, but any man who joined those classes, if he were a plumber, would be able to gradually improve his skill and knowledge, and so prepare himself for a higher and more independent position.

Mr. Clegg, Master Plumber, said that although at the time he applied to be registered he had for some years been a master plumber, and not actually working at his trade, he had willingly offered to undergo any practical test which the Plumbers' Company thought fit to propose. But there were present a number of practical men who had known him all his life, and knew what he could do, and he had not been required to pass an examination. He referred to the spread of technical classes, and mentioned that he had seen boys at those classes bending pipes, wiping joints, and doing all that they would be required to do in the course of a day's work. This he considered a grand thing for the rising generation.

Mr. C. T. Mills, M.I.M.E., Assistant Teacher of Plumbers' Classes at City Guilds Institute, in proposing "Scientific Classes for Plumbers," said that the natural outcome of the registration movement was technical education, and the natural outcome of the latter was scientific classes. It was thought by many that the outcome of the registration movement would be that plumbers would become sanitary engineers. He only hoped that such would be the case. But that could not be until they had received proper training. Plumbers should go through a certain amount of scientific work so that when they put up for a higher position it might not be said that they were fit only to be working plumbers. If the promoters and aiders of that movement succeeded in producing sanitary inspectors who had first of all been practical plumbers, they would have reached a point at which the success of the registration movement would be assured. The action of the Plumbers' Company in connexion with the plumbers' classes and examinations had paved the way for the establishment of similar classes in connexion with other trades.

Mr. George Taylor, Foreman Plumber and Teacher of Plumbers' Classes at the People's Palace, said geometry taught plumbers how to set out their work in a manner which gave to persons not possessing any knowledge of the trade a fair idea of what the effect would be. Mathematics taught them to calculate the result of what they did. Many plumbers did most unheard-of things because they had no idea what the result would be. Metallurgy and chemistry explained the working and right application of the chief materials used by plumbers. It was only necessary to know so much of those subjects as applied to their trade, and there was no very great difficulty in that.

Mr. Alderman Knill (Past Master), referring to "The Future of the Registration Movement," said there was a good saying that we learn from the past to prepare for the future. The Plumbers' Company came down from the days when every trade was protected by its Company. Then every journeyman plumber was an artist in himself. In those days some of the work might have been crude and heavy, but there was no "scamping." The reason of this was that at that time plumbers' apprentices lived in the houses of their masters. The master watched over his apprentice with paternal solicitude, and in his turn the apprentice grew to regard his master and the work he learned from him. In the present day it was impossible to return to this state of things. But they could do their best to restore the system of apprenticeship, without residence with the master, and above all things they could see that every young plumber should be taught the science of his work, and, as far as possible, have restored in him the artistic spirit which animated the plumber of old. This the Plumbers' Company were doing by the registration, technical training, and examination of plumbers.

Mr. W. H. Webb, Master Plumber, in responding, reviewed the course of the movement since its origination at the Congress of Plumbers in 1884, and expressed the opinion that the plumbing trade must be generally satisfied with the progress made.

**Proposed Sea-wall, Walton-on-the-Naze.**—The Walton-on-the-Naze Improvement Commissioners have selected Mr. R. F. Grantham as their engineer to prepare plans and estimate for the construction of a sea-wall and groynes along the frontage of the town.



## UNHEALTHINESS OF DUBLIN BARRACKS.

SIR,—The observations made in last week's *Builder* on the causes which contribute to the unhealthiness of the notorious Royal Barracks in Dublin induce me to state some facts which strangely pass unnoted by local sanitarians, and go far to support Sir R. Rawlinson's contention. I have for many years had an intimate knowledge of all the older City of Dublin and its buildings, and have made a special study of records of buildings which have disappeared, and the dates of their erection and periods of duration. I can say that, almost without exception, every building constructed of certain local materials is old, rotten, unhealthy, or dangerous, before it has attained an age of 100 years. With the exception of the two cathedrals, constantly renewed and rebuilt, and some unimportant fragments elsewhere, there is not a remnant of mediæval Dublin. Its churches, monasteries, city walls, and towers have long vanished. The stone houses of fifteenth-century Dublin generally gave place to "cage-work" houses of the Chester style in the sixteenth century. They were ready to be superseded on their sites at the end of the seventeenth century by what we call the "Dutch Billy" houses. There are a very few of these, with their curved and pedimented gables in a worn-out, tottering condition, to be seen now, and they date from about 1730-30. These gave place about 1790-1800 to the Georgian houses, which are now in turn, in the older city, worn-out, unhealthy, and quite unfit for decent habitation.

The cause of the short duration of so many buildings, public and private, is in some respect in later buildings due to bad bricks and bad building, but it is far more due to the local stone almost exclusively used in rubble masonry. This is a sedimentary rock, locally known as Calp, and it is, when quarried, often mistaken for a hard, compact limestone. It is, however, nothing of the kind, but a treacherous material, which, under conditions of humidity, sooner or later releases to its condition of native mud. Yet, even still it is widely employed. It is used in flags for foundations. In damp ground it softens, and the house subsides, cracks, and becomes ruinous, or, as in some notable cases, falls without warning. The basements built of it, and their floors laid with it, reek with condensation. As the flags rot and break up, all kind of foulness accumulates in the subsoil of the house, while the soft, sodden walls of the basements are absorbent of unhealthy impurities. In semi-ruinous houses, brick-built above these basements, and ill-built, with rotten wood floors, uncleaned, and,—*experto crede*,—in most cases plagued with incredible swarming of *fleas*, live the great majority of the poorer Dublin folk in the older City. These evil conditions are over and above the more generally notorious ones of insufficient sanitary arrangements and overcrowding in houses not originally meant for tenement occupation. Yet surprise is expressed at the high death-rate of Dublin!

I would maintain, in support of what I have read in the *Builder*, that any building constructed of Calp stone and native timber which has survived 100 years must be rotten and unhealthy for occupants, and only to be improved by being improved off the face of the earth. I note that the foundation of the Royal Barracks was laid in 1701.

This winter has been one of extraordinary humidity, without drying intervals. I have noted in the old walls in and all about the City a progress of rotting of the black stone within four months such as I have not noted in some years before. The condition of roads "repaired" with this utterly unsuitable stone for such a purpose, especially on the north side of Dublin, is simply a morass of black, sticky mud. There has been no time in my experience when, apart from the anxieties about drainage and ordinary sanitary improvements, the older houses of Dublin, by whomsoever occupied, more demanded the serious attention of all persons who are responsible for their condition.

THOMAS DREW, R.H.A.

## CLEANING PLASTER CASTS.

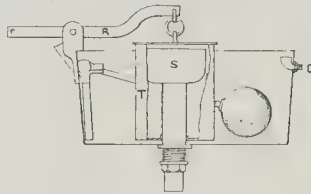
SIR,—Can any of your readers inform me what is the best mode of cleaning fine plaster casts; also a means of rendering them washable?—J. W.

**Placing of Organs in Churches.**—We have received a letter from Mr. Belcher on this subject, which we are obliged to defer till next week, for want of space.

## WATER-WASTE PREVENTING FLUSHING CISTERNS.

SIR,—We fear your note in the issue of December 29, 1888, re the syphoning-out of water-waste preventers, may be taken as a condemnation of this method of flushing closets.

We have for years past been manufacturing a vacuum water-waste preventer, with the stand-pipe S (as shown in diagram) a quarter of an inch above the top of cistern, and more than 1 in. above the overflow, O.



The action of this cistern is very simple, and it is started by merely pulling down the lever, R, which raises the cylinder, T, which draws up and discharges into mouth of stand-pipe, S, sufficient water to start the annular syphon.

It is impossible that this tank could fail in the way you describe. DOULTON & Co. Lambeth, Jan. 14.

## The Student's Column.

## TOWN DRAINAGE.

## III.—THE SURVEYOR.

WHEN the General Board of Health ceased to exist, ten years after its formation, the Act of 1848, which brought it into existence, continued in force, but was amended by the Local Government Act of 1858, the two Acts being read together, and although the obnoxious clauses of the former Act still remained, they were rendered of no effect by the fact that the General Board to which they referred had no longer any existence. Then followed an amendment, in 1861, of the Local Government Act of 1858, and another amendment in 1863; then the Sewage Utilisation Act of 1865, and the Sanitary Act of 1866, with another Sewage Utilisation Act in 1867.

In 1872 was passed the first Act of Parliament for placing every part of England and Wales under a Sanitary Authority. Before that, only parts of the country—those, namely, which were urban in a very strict sense—were under any sanitary jurisdiction. The large areas outside these, in which, nevertheless, were many populous places, were not touched by any Act having regard to sanitary works, and even this one did no more than constitute the authorities and authorise the making of sanitary surveys of the districts not included in former Acts; such surveys, when made, being intended as guides in the action of the Rural Sanitary Authorities, and bases upon which they could, if they chose, proceed with the proper work of sanitary authorities, both in urban and rural districts. This Public Health Act, 1872, together with those which were passed in 1867, 1866, and 1865, called the Sanitary Acts, and the previous ones of 1863, 1861, 1858, 1848, and 1847, formed a great mass of legislation; but so many Acts, some of which contradicted others, or at least led to difficulties from conflicting interpretations, caused much confusion, and in 1875 all former Acts relating to public health in England and Wales were consolidated and amended by the Public Health Act of that year, which is now the legal authority for all works of drainage. This Act brought into one view the confused mass of enactments of the previous twenty-eight years, and so afforded an opportunity for reconsidering the whole question with the experience of that time, during which knowledge of the subject had increased and definite opinions had been formed; but it was not intended or put forward as a full measure of what is required in a Public Health Act. At least it cleared the ground, and, such as it is, it constitutes the chief legal instrument of sanitary works at the present time. Its parent was the Act of 1872.

It was introduced in Parliament by the Local Government Board, which was formed in 1871 to combine the administration of the Public Health Act with that of the Poor Law, and, as is well known, the same Board introduced the

recent Local Government Act relating to County Councils. There remains one other Act relating to the present subject,—that of Rivers Pollution Prevention, passed in 1876, the administration of which has hitherto had no practical effect, or so little as to be almost none. Its administration has now been transferred to the County Councils. This completes a general view of the sanitary laws relating to town drainage in all parts of England and Wales except the metropolis, which has always been separated from other towns in Acts relating to this subject. In these the surveyor is so frequently referred to that, either in person or by his representatives, he is met with at every turn. The mere mention of the numerous Acts of Parliament, the provisions of which are comprehended in the 343 clauses of the Public Health Act of 1875, is sufficient to show the importance of his position, but, besides these, some of his duties may be mentioned. It has become a settled thing that he must have a competent knowledge of all works, of whatever nature, which may be undertaken by the authority for whom he acts, who now unwillingly ask any other professional advice; but besides drainage works, water works, and other municipal works of ordinary character, he may at any time be called upon to advise in others,—such as an interference with roads or any public property by projected railways, or tramways, or telegraph lines, and by water and gas works where these belong to commercial companies. More frequently, however, he is consulted about the sewerage of the town, house drainage, water supply, the construction of roads and bridges, and their maintenance, floods, municipal buildings, markets, abattoirs, mortuaries, baths, cemeteries, police-stations, fire-brigade stations, recreation grounds, and public parks; watering and lighting streets, new streets and improved frontages of old ones, valuation of property to be interfered with by such improvements; then, as matters of course, the preparation of all plans, specifications, and other instructions necessary for the carrying out of works; and the certification to the authority that all contracts have been duly completed. He may have to prepare instructions for legal documents required in contracts, to certify accounts, to have charge of all materials and implements of the public stock and the places where they are kept, to purchase or hire horses and carriages, to inspect with the medical officers all slaughter-houses, to fix the levels and inclinations of all new streets, to prepare plans for the drainage of new districts, to have an accurate knowledge of the condition of every main sewer into which it may be convenient to discharge additional sewage from a new district, and the quantity of sewage it is capable of carrying without flooding the basement-floors of adjoining houses; and, it may be added, the very important duty of courage to advise a new outfall-sewer, when, by continuing the use of an old one with new districts added, sewage must find its way into the cellars and basement-floors of adjoining houses on the occurrence of any great rainfall, subsiding very slowly and doing much damage. The cellars of houses under these circumstances are, in fact, sewage reservoirs for the time required. To say nothing of these metropolitan sewers, cases of this kind have occurred in some of those towns which have extended far beyond the old limits, and even beyond those limits which were looked forward to when the main sewers were laid.

Then, the surveyor must apportion the costs of private improvements between the several owners of property in those cases where a corporation or a local Board execute works on their behalf. Owners of building plots along the line of a new street sometimes prefer to let a notice lapse in order that the sewer and other works they may be required to pay for may be done by the town authority and charged to each owner according to his frontage; a mark of confidence in the surveyor for which he ought to be duly grateful. Then he is responsible for the monthly measurements on account of contract works; must prevent encroachments upon roads or other public places; receive notices of house-drain connections, and make due appointments for the work being done; keep all public buildings safe for the egress of large numbers of people, not only when first built, but from time to time thereafter; examine all plans of proposed new buildings, and, when built, certify their fitness for habitation; protect passengers in streets from the fall of dangerous buildings, and, by hoardings, make it possible to erect a



building in a busy thoroughfare without accident to passengers; to be satisfied of the sufficient strength of all temporary platforms and other erections for public meetings. To prepare all plans and sections for deposit at the Private Bill Office, the Board of Trade, and at the several offices of the clerk of the peace and the parish clerks, in the case of improvements for which it is intended to apply for an Act of Parliament or for a Provisional Order. All these requirements may be found in laws or bye-laws, or in regulations made in accordance with them. The Municipal Corporations Act of 1882 adds to these working men's dwellings which may be erected on land belonging to a corporation. The office of Town Surveyor, or "Surveyor," as stated in the Act, is called that of Borough Engineer in some boroughs, and Borough Surveyor in others, and City Engineer or City Surveyor in some cities; not because of any difference in the duties or practice in different towns; there is no rule; it is a matter of fancy on the part of the occupant of the office. All are engineers, but while some are content to accept the legal term of Surveyor, others prefer to be called the Engineer. In two large cities, situated within thirty miles of each other, the office in one of them is that of City Engineer, in the other, City Surveyor. In two other large towns, both boroughs, the office in one is that of Borough Engineer, in the other, Borough Surveyor, although the Surveyor's town is larger than the Engineer's. These local differences we neglect, and adhere to the legal term.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

284, Improvements in Floor-tiles. M. J. Adams.

By this invention a ribbed or corrugated floor-tile is made of earthenware or metal, or preferably of glass. The corrugations conduct the water away and renders the tile specially suitable for wet and exposed positions.

1394, Ornamental Work for Walls. C. J. Heaton.

A mould pattern is used by this inventor for the production and multiplication in any required number of pieces of decorative material in lengths, in panels, or other forms, made with paper-pulp or composition. The decorative effect is that of lines or ridges raised above the surface, the ridge being black, coloured, or gilt, and the depressed surfaces of another colour or colours to produce any pattern. The design is first copied in "cloison" wire, which is affixed to a metal backing by soldering; or "copper" wire as employed in wall-paper block-printing, i.e., a wood block having copper wire driven into it, and part standing up from it is used. A paper mould is taken, and felt is forced down on the paper, and an embossed pattern produced. Electro-deposition is also used to produce the metallic effects required.

2,180, Seats for Water-closets. H. Wren.

To avoid objectionable contact where seats are used by many persons, a number of detachable seats are used, each of which may be kept by its owner in a suitable box, and under lock and key. They slide on, and distinct pieces or feet are provided on the detachable seat, which correspond with grooves, sockets, or cavities on the fixed part, or vice versa. If desired, they may be formed of several pieces hinged or folded together.

2,815, Fireproof Floors. M. Fawcett.

This invention consists of a floor with flanged tubed lutelets made of fire-resisting clay of various sections. These lutelets rest on the lower flanges of rolled iron joists passing under the flange of same, thus an air space is formed between the iron joist and the flange of the tubing. Concrete is then filled in between and over the tubes, forming concrete arches, which take their bearing on the lower flange of the iron joists, independent of the tubes. The function of the tubes is to protect the iron joists from the action of fire, to reduce the dead weight of the floor, and to act as a centreing until the concrete is set. A dove-tail groove is formed in the tubes, to make a key for the plaster of the ceiling.

1295, Fanlights, Sashes, &c. R. R. Harrison.

According to this invention, a vertical screw is carried by a fixed bracket with a cog-wheel attached to its lower end, the cog of which acts in conjunction with a worm or spiral projection upon a spindle which is attached to the fixed bracket and revolves at right-angles to the vertical screw. The spindle being operated by a cord-passage over a pulley at the top and causes the vertical screw to revolve, thereby raising or lowering the screw-nut as may be required.

16272, Ventilators. B. Holbrook.

The principle of this invention is the introduction

into ventilators actuated by a flame a method similar to the ordinary blow-pipe, i.e., in reducing the supply-passage through contracted orifices, and delivering it directly against the flame, which causes great energy of combustion, the liberation of much heat, and the establishment of an active current through the supply passage of the apartment to be ventilated.

## NEW APPLICATIONS FOR PATENTS.

Jan. 1.—5, W. Andrew, Flooring Cramp.—41, E. Lake, Locks for Double or Folding Doors.  
Jan. 2.—63, O. Earl, Outside Shop Fittings.  
Jan. 3.—94, J. Hargreaves and others, Treatment of Line Refractories for the Manufacture of Cement.  
106, E. Hutchins, Chimney-tops, &c.—110, J. Holder, Heating Buildings, &c.  
Jan. 4.—174, J. Birkett, Hoists or Lifts.—182, J. Brown, Sash Windows.—195, J. Greathead, Tunneling Apparatus.—198, A. Vuigner, Hydraulic Lift or Hoist.  
Jan. 5.—234, A. Illidge, Opening and Closing Fanlights, Skylights, &c., and retaining them in any position.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

15,653, W. Goutley and G. Burton, Holders and Fasteners for Sliding Window Sashes.—16,476, H. Soell, Fasteners for Doors, &c.—17,117, F. & E. Cornish, Fastenings for Window sashes, &c.—17,215, A. Richardson, Window or Sash Fasteners.—17,325, A. Armstrong, Combined Electrical Bell, Battery, and Push.—17,363, J. Hargreaves, and others, Manufacturers of Cement, &c.—17,364, C. Young, Automatic Bolt for Double Doors.—17,597, H. Walker and R. Carey, Lifts and Hoists.—17,601, H. Handcock, Electrical Bell.—17,607, H. Fenton, Warming Rooms and Buildings.—17,612, U. Smith, Syphon Sewerage System.—17,641, J. Ogg, Cutting and Dressing Stone, &c.—17,785, P. Kees, Water Waste Preventers, &c.—17,830, R. Peel, Top Bars for Fire Grates.—17,845, J. Corcoran, Heating or Warming Buildings, &c.—17,991, J. & A. Duckett, Water-closets.—18,235, C. Roe, Fire Grates.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

2,605, E. Dean, Cooling and Ventilating Buildings, &c.—3,178, T. Cook, Dividing Rooms by Revolving and Sliding Partitions.—3,200, S. Craves, Construction of Windows and Casements.—3,380, R. Ferrens and J. Love, Gully-traps, &c.—3,457, G. Mitchell, Waste-preventing Valves for Water-closets, &c.—3,513, W. Rigby, Dressing or Cutting Stone, &c.—3,553, J. Ward, Automatic Sprinklers.—15,398, H. Plummer, Disinfecting Apparatus for Water-closets, Drains, &c.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

| JAN. 2.                                                                                    |       |
|--------------------------------------------------------------------------------------------|-------|
| By T. T. TAYLOR.                                                                           |       |
| Brook Green—6, Dewhurst-road, 92 years, ground-rent £8 .....                               | 2455  |
| JAN. 8.                                                                                    |       |
| By PHILLIPS, LEA, & DAVIES.                                                                |       |
| Camberwell—155, Southampton-street, freehold ...                                           | 460   |
| Heathfield, Sussex—"Barn House Farm," 29 acres freehold .....                              | 675   |
| Old Ford, Oster-road—Ground-rent of £2, 18s. 6d., reversion in 65 years .....              | 75    |
| Limehouse, Ropemaker's Field—Majority of a ground-rent of £32, reversion in 64 years ..... | 400   |
| Camberwell—Southampton-street, ground-rent of £6, reversion in 50 years .....              | 210   |
| Battersea, York-road—Ground-rent of £4, reversion in 58 years .....                        | 120   |
| Hilbert-street—Ground-rent of £10, reversion in 59 years .....                             | 250   |
| Linda-street—Ground-rent of £12, reversion in 59 years .....                               | 300   |
| Ground-rent of £11, 3s., reversion in 60 years .....                                       | 260   |
| By C. & H. WHITE.                                                                          |       |
| Lambeth, Paradise-street—Freehold manufacturing premises .....                             | 5,150 |
| High-street—Coppold rental of £120, with reversion in 65 years .....                       | 2,450 |
| Mile End—62, White Horse-lane, 77 years, ground-rent £7 .....                              | 305   |
| 34 and 36, Adelphi-gate, 16 years, ground-rent £8 .....                                    | 100   |
| 8 and 10, Woolsey-street, 11 years, ground-rent £4, 10s. .....                             | 135   |
| 161 and 163, Jubilee-street, 11 years, ground-rent £4, 12s. .....                          | 200   |
| New Cross—185, New Cross-road, freehold .....                                              | 700   |
| Strand, Wood-street—Ground-rent of £40, reversion in 75 years .....                        | 1,250 |
| JAN. 10.                                                                                   |       |
| By H. C. NEWTON.                                                                           |       |
| Marylebone—6 and 7, Upper Bridport-street, 20 years, ground-rent £5, 6s. .....             | 365   |
| By C. C. & T. MOORE.                                                                       |       |
| Old Ford-road—No. 439, "The Gunmakers' Arms" Berchouse, freehold .....                     | 970   |
| Bethnal Green—19 and 21, Collingwood-street, copyhold .....                                | 355   |
| Holloway—78 and 80, George's-road, freehold .....                                          | 400   |
| Forest Gate—2, Beaconsfield terrace, 57 years, ground-rent £10, 10s. .....                 | 150   |
| JAN. 11.                                                                                   |       |
| By W. B. HALLETT.                                                                          |       |
| Holloway—19, Ward-road, 67 years, ground-rent £6 .....                                     | 300   |

## MEETINGS.

## MONDAY, JANUARY 21.

Society of Arts (Lecture).—Mr. Alan S. Cole on "Egyptian Tapestry and Textiles." 1. 8 p.m.  
London Institution.—Mr. A. A. Common, F.R.S., on "Astronomical Photography." 5 p.m.  
Leeds and Yorkshire Architectural Society.—Mr. R. T. Blomfield, M.A., on "Architects of the English Renaissance." 7.30 p.m.

## TUESDAY, JANUARY 22.

Society of Arts.—Sir J. D. Linton, P.R.I., on "Some Recent Movements in Relation to the Applied Arts." 8 p.m.  
Institution of Civil Engineers.—Further discussion on Mr. E. Worthington's paper on "The Compound Principle as applied to Locomotives." 8 p.m.  
St. Paul's Ecclesiological Society.—Mr. Andrew Oliver on "Monumental Brasses and their Details." 8 p.m.  
Birmingham Architectural Association.—Mr. F. R. Farrow, A.S.T.E.A., on "The Examination in Architecture, and the Necessary Preparation." 8 p.m.  
Manchester Architectural Association.—Paper by Mr. J. A. Gotch, F.R.I.B.A. 7.30 p.m.  
Glasgow Architectural Association.—Mr. Hippolyte J. Blanc on "Scottish Collegiate Churches of the Fifteenth and Sixteenth Centuries." 8 p.m.

## WEDNESDAY, JANUARY 23.

Society of Arts.—Professor G. Forbes on "Electric Motors for Central Stations." 8 p.m.  
Civil and Mechanical Engineers' Society.—Mr. R. N. Boyd on "Boring for Petroleum in Galicia, Austria." 7 p.m.  
Liverpool Engineering Society.—Mr. H. H. West on "Steel in the Hands of the Naval Architect." 8 p.m.

## THURSDAY, JANUARY 24.

Sanitary Institute.—Dr. G. V. Poore on "London: Ancient and Modern, from a Sanitary Point of View." 5 p.m.  
Institution of Electrical Engineers.—Prof. A. Jamieson on "The Insulation Resistance of Electric Light Installations." 8 p.m.  
Society of Antiquaries.—8.30 p.m.  
Royal Institution.—Professor J. W. Judd, F.R.S., on "The Metamorphoses of Minerals." 8 p.m.  
Edinburgh Architectural Association.—Mr. A. N. Paterson, M.A., on "Training the Architect Abroad and at Home." 8 p.m.

## FRIDAY, JANUARY 25.

Institution of Civil Engineers (Students' Meeting).—Mr. W. W. F. Pullen on "Water-softening and Filtering Apparatus for Locomotive Purposes, at the Taff Vale Railway Company's Penarth Dock Station, near Cardiff." 7.30 p.m.  
Society of Arts (Indian Section).—Mr. H. H. Johnston on "The Asiatic Colonisation of East Africa." 8 p.m.

## Miscellaneous.

Properties for Sale at the Mart.—On January 25, under appointment of Mr. Justice Stirling (Lewis v. Wintertone), the lease of the Foxdale (Pandora) Lead Mine, three miles distant from Llanroc railway station, with all plant, machinery, &c. This property, extending over eighty-seven acres, is held for an unexpired term of seventeen years from June 1, 1887, at a nominal rent of 20s. a year, emerging into a royalty. On January 31, Blackwall Point Dry Dock, East Greenwich, freehold, covering an area of 4½ acres; the dock is 470 ft. by 68 ft.; there are three large slipways, and the river frontage is 400 ft. long. The subway, undertaken by the Metropolitan Board of Works, will be open, at its south end, close to these premises, and thus place them in direct communication with the opposite Blackwall. On February 1, the block known as Times-chambers, opposite St. Paul's station, Queen Victoria-street, held for about 97 years at a ground-rent, and yielding a total rental estimated at 1,325s. a year. The ground floor and basement are in hand; the upper three floors are let to the National Telephone Company, on lease, at 575s. per annum. On an early day, the unexpired fifty years' lease of Nos. 12 and 13, Poultry, at the rent of 450s. per annum. The premises, lately rebuilt, consist of five upper floors, arranged as offices, with a ground-floor of two shops and basement, which yield a rental of about 1,450s. a year. On February 22, by order of the Commissioners of Sewers, a freehold ground-rent of 360s. per annum, secured upon No. 164, Fenchurch-street, and on the Blue Anchor Tavern, Bell-court. In the rear, with reversion in twenty-eight years. And at Muscovy's Hall Tavern, in Ashton v. Cheney, The Grapes, No. 45, Strand, with Nos. 15 and 16, York-place, in the rear—freehold. The Grapes Tavern was rebuilt in 1869, and is let on lease for an unexpired term of twenty-nine years, at 160s. per annum.

The Organ, Gloucester Cathedral.—The reconstruction of this hitherto inadequate instrument was celebrated by three special services, on Thursday, the 10th instant. The main body of the organ was built by Renatus and Charles Harris, in 1666. The case has not been interfered with, and several of the original pipes, highly ornamented, are retained.



**South Kensington and Bethnal-green Museums.**—We are officially informed that there has been a very marked increase in the number of visitors to the South Kensington Museum during the last year, the numbers rising from 738,412 in 1887 to 897,225 in 1888. But this increase of 108,813 is quite put in the shade by that of 500,682 at the Bethnal-green Museum, which, in its total of 910,511 for the past year has, as will be seen, distanced the parent institution. This great influx of visitors, more than double that of the previous year, was no doubt in great measure due to the exhibition there of Her Majesty's Jubilee presents after they had been shown to the West-end at St. James's Palace. But some part of the increase must be attributed to the fine collection lent by the Hon. W. F. B. Massey Mainwaring. The increase in numbers at South Kensington was not confined to the main Museum, but extended to the separate collections,—the Science Museum and the India Museum,—which are in the galleries at the west side of Prince's-gate, and which are not open in the evening, as are,—on three evenings in the week,—the collections in the main building on the east of Prince's-gate, and the Bethnal-green Museum. The numbers visiting the science collections increased from 177,465 in 1887, to 268,796 in 1888, notwithstanding the fact that the galleries have been severed by the new road cut across the Horticultural-gardens, while the visitors to the India Museum increased from 116,674 to 182,911. The numbers of visitors are taken in all cases by turnstiles.

**A Boot and Shoe Factory at Croydon.**—Additions to the factory at South End, Croydon, for Messrs. J. Cooper & Son, boot and shoe manufacturers, have just been completed by Mr. G. E. Bryan, builder, South Norwood, from the plans and under the direction of Mr. F. West, architect, Croydon. The new buildings provide accommodation for 250 employees, and three new stock-rooms, each measuring 70 ft. by 40 ft.; a packing-room, 60 ft. by 35 ft.; and "fitting-up" and "press" rooms. In fitting up two of the new stock-rooms with racks to receive the finished boots, nearly four miles of small scantling were used. The iron girders and columns were supplied by Messrs. Measures Bros. & Co., of Southwark; the machinery by Messrs. Gimson & Co., of Leicester; and a considerable portion of the floors and principal staircases are constructed of old ship oak and teak from the yards of Messrs. Castle & Sons, Millbank.

**High Speeds for Passenger Lifts.**—We are informed that a passenger lift has just been completed at Beaufort Mansions, Queen Anne's Gate, by Messrs. Archibald Smith & Stevens, which on trial carried its ordinary working load 62 ft. high in nine seconds, or at the rate of 413 ft. per minute. But as the first and last 10 ft. sections were utilised for gradually starting and stopping respectively, the remaining 42 ft. were actually run at the rate of 540 ft. per minute. Notwithstanding this high speed, we are told that the cage was entirely controlled by an operator travelling with it. When adjusted for ordinary running the maximum efficiency was found to be 76 per cent. The actual maximum was, however, 84 per cent., the difference of 8 per cent. being sacrificed to obtain quick descent of the empty cage. The machine was one of the "Reliance" type, constructed under Stevens and Major's patent.

**New Offices for the Metropolitan Police.**—Under the superintendence of Mr. Norman Shaw, R.A., architect, these buildings,—on the site of the abortive Opera House, Victoria Embankment,—are making progress, and will be ready within perhaps twenty months hence. The structure is to be 150 ft. by 200 ft. on plan, and about 110 ft. high. The various departments will range around an inner square. The material is granite, the blocks dressed at Dartmoor, for the lower two storeys; for the storeys above, brick with stone dressings. The top floor will be appropriated, in part, to a warehouse for stores, constables' outfits, and a tailor's workshop.

**Lectures on Geology.**—It has just been arranged that Professor H. G. Seeley, F.R.S., will deliver a course of lectures in Holborn Town Hall, Gray's Inn-road, every Wednesday evening during February, at eight o'clock. This course is given at the request of the London Geological Field Class. The lectures will relate to the strata to be seen in the coming summer excursions of the class. A comparison will be made between the geological structure of localities to be visited and the conditions of the same strata in other parts of England or the Continent.

**The Carpenters' Company and Technical Education.**—A dinner was given on Tuesday evening at Carpenters' Hall, London-wall, by the Master and Wardens of the Carpenters' Company to those gentlemen who have lent assistance to that body in their efforts to improve the technical education of their craft. The Master (Mr. Alfred Rosher) presided, and among those present were Mr. Seymour Lucas, R.A., Mr. R. Norman Shaw, R.A., Prof. Aitchison, A.R.A., Prof. T. Roger Smith, Mr. T. Chatfield Clarke, Mr. C. J. Shoppee, Mr. H. C. Smith, Mr. J. Wilkinson, Mr. Warden Banister Fletcher, Mr. Warden W. Robertson, Mr. Warden T. Robertson, and Mr. Stanton William Preston, Clerk. The loyal and patriotic toasts having been drunk, Mr. H. C. Smith, as Past Master, proposed the "Examiners at the recent competitions instituted in connexion with the exhibition organised by the Company." In doing so, he said that for years past the Company had been endeavouring to raise the artistic taste, scientific knowledge, and skill in workmanship of those engaged in their craft, and in evidence of this he might point to the various classes for technical and other education which they had established at Stratford, together with an excellent library for the use of students. He might also refer to the exhibitions which had been held in that hall, and to the lectures there given by the most eminent professors of the day, as well as to the numerous prizes for proficiency which they had awarded. The Company felt, moreover, that they had a further duty to perform, and that was to bring the proficiency of those who had studied under their guidance, before the employers of labour. With this object in view, they had instituted stringent and searching examinations, conferring certificates the production of which would stamp the holders as men possessing the talent, skill, and knowledge enabling them to fill the higher positions in the trade. They were fortunate in having some gentlemen belonging to their body who were well qualified to act as examiners, and they were further fortunate in securing the services in this connexion of other gentlemen of eminence in architecture and the building trade. Most heartily they had worked in carrying out the object of the Company, and he begged to offer their sincere thanks for the assistance received from them. Mr. Slater and Mr. Wilkinson responded.—In proposing the health of the "Judges and Exhibitors" at the Exhibition, Mr. Preston complained of "appeals to the gallery" made by certain candidates for the London County Council, who spoke of dis-establishing the London Companies. He denied the truth of the assertion that the London guilds were not working in behalf of the trades which they represented. The City Guilds had taken up the work of technical education with their whole heart, and they would not shrink from it. Mr. Chatfield Clarke, in replying, said he agreed with Sir Frederic Leighton that the English workman was deficient in artistic sense, but at the same time he could testify that a good deal of excellent and creditable work had been done by the students in the technical classes of the Carpenters' Company. That Company had set a very noble example, and those who desired to see the City Companies, not destroyed, but going back to their real functions, would gladly recognise that the Carpenters' Company were doing admirable work.

**Madras Tramways.**—Under the new concession, the construction of the lines is to be commenced within twelve months from, it is presumed, December, and Nos. 1 and 2 lines are to be open for traffic before the expiry of two years, and the remaining lines before the expiry of five years from the date of the order. The local authorities are empowered to purchase the tramways after the expiration of twenty-one years, the amount to be paid for the undertaking to equal the amount of nominal capital actually issued and expended by the promoters at date of purchase, plus one-fourth of such amount added by way of compensation for compulsory acquisition of the undertaking; the purchase-money to be paid in gold in London or Madras. The motive-power may consist of animal, steam, or any mechanical power, provided that, in the two latter cases, their use shall be subject to the regulations set forth in the schedule attached to the order. The engines and carriages to be used are to be of the best construction. The total length of the lines would be 18½ miles, and the cost of laying them would range between 5,000l. and 6,500l. per mile.—*Indian Engineer.*

**Fatal Fall of a Building at Birmingham.**—A shocking accident, resulting in the death of two men, occurred on Wednesday afternoon in Lawley-street, Birmingham, where (according to the *Daily Chronicle*) workmen have been engaged in extending the viaduct by means of which the Midland and London and North-Western Railway Companies' trains cross Lawley-street towards Sutton. In order to complete this work, the Railway Tavern public-house, which adjoined the viaduct, was, some three weeks ago, pulled down, but the property, comprising two houses next the tavern, on the other side, was left standing, and was not shored up with timber. A day or two ago the workmen employed in the extension of the viaduct commenced to lay the foundation of a brick pier on the ground which originally formed the foundation of the public-house, and immediately under the shadow of the building already mentioned. Six or seven men were thus engaged on Wednesday when a rumbling noise was heard, and a cry was raised that the building was falling. Three of the men scrambled out of the foundation and made good their escape into Lawley-street, but three others, named Harry Manning, labourer; William Clews, bricklayer; and—Poole, bricklayer, were not so fortunate. The whole of the gable end of the house, from top to bottom, came down with a crash upon them. As soon as they were released they were driven to the General Hospital. Manning was found to be dead, and Poole died shortly after his admission. Clews has sustained terrible injuries, and his recovery is doubtful.

**Liverpool Engineering Society.**—The sixth ordinary meeting of the present session of the Liverpool Engineering Society was held on the 9th inst. at the Royal Institution, Colquhoun-street, when the chair was occupied by Mr. Charles H. Darbishire, Assoc. M.Inst.C.E., the President. The routine business having been transacted, Mr. A. W. Brightmore, M.Sc., read a paper on the "Application of Atmospheric Air to produce Motive-power." After giving a short account of the thermodynamics of gases, Mr. Brightmore showed that the efficiency of a steam-engine was limited by the loss of temperature between the gases in the furnace and the water in the boiler. Some hot-air engines were open to the same objection, and others that had not this defect lost efficiency by inefficient expansion. In the gas-engine,—a species of air-engine, the working substance being air, to which heat was applied in the most direct manner by the combustion of gas,—the amount of expansion obtained was greater than in the air-engines. The gas-engine, therefore, worked between wider limits of temperature, and was consequently more efficient than either the steam-engine or the hot-air engine. A brief discussion ensued, and the thanks of the meeting were given to Mr. Brightmore for his paper.

**Institution of Mechanical Engineers.**—The forty-second annual general meeting of this Institution will be held on Wednesday, Jan. 30; Thursday, Jan. 31; and Friday, Feb. 1, at 25, Great George-street, Westminster, by kind permission of the Council of the Institution of Civil Engineers. The chair will be taken by the President at half-past seven p.m. on each evening. The annual report of the Council will be presented to the meeting on Wednesday. The annual election of the President, Vice-Presidents, and Members of Council, and the ordinary election of new Members, Associates, and Graduates, will take place at the meeting on Wednesday. The President, Mr. Edward H. Carbutt, having been in office for two years, will retire, and will induct into the chair the President-elect, Mr. Charles Cochrane. The following papers will be read and discussed, as far as time permits:—Supplementary paper on "The use of Petroleum Refuse as Fuel in Locomotive Engines," by Mr. Thomas Urquhart, Locomotive Superintendent Grazi and Taurisina Railway, South-east Russia; on "Compound Locomotives," by Mr. R. Herbert Lapage, of London; and on "The Latest Development of Roller Flour Milling," by Mr. Henry Simon, of Manchester.

**New Museum in Berlin.**—A Berlin journal states that Professor Virchow, the well-known *savant*, is making arrangements for the establishment in Berlin of a national German museum, similar to the Northern Museum at Stockholm. German national life is to be fully represented and illustrated by means of costumes, furniture, specimens of the artisans' craft and of home industry.



**The English Iron Trade.**—There is no abatement in the generally steady tone of the English iron market. There is a tendency, as there always will be, on the part of buyers to beat down the prices of some manufactures, but, on the whole, the tendency of the market is upwards. The Glasgow warrant market has been flat this week, and warrants are lower than a week ago. Scotch makers, although somewhat quieter, keep up their rates very well, generally. North of England pig-iron is steady at 34s., with makers for prompt and rising for forward sales. Hematites are also firm at their former values. Lancashire, Lincolnshire, and Derbyshire producers of crude iron hold out well against any reduction, being fully sold forward; the first-named having been able to advance their list rates 1s. a ton. In Staffordshire, also, there is no giving way. Old materials (scrap iron and old rails), although the trade in them is limited, are firmly held at the old rates. Finished iron makers are very busy, and easily obtain their higher prices. Staffordshire sheets have altogether been advanced 10s. per ton since the beginning of the year, and Scotch sheets, plates, and nail rods have also risen from 6s. to 10s. a ton. Bar makers generally are doing a good business. Tin plates are quiet, but prices are not materially changed. Steel manufacturers are still getting a good run of orders for plates and angles, as well as for rails, and altogether their prospects for the year are bright. The outlook in the shipbuilding trade continues as favourable as ever. Engineers keep well employed.

**Registered Plumbers.**—In view of the mortality among young children from zymotic diseases traceable to insanitary arrangements, it is satisfactory to notice that the authorities of the new Convalescent Home for Children, at Gilmerton, N.B., have insisted upon the plumbers' work and sanitary arrangements being carried out by registered plumbers.—*Lancet.*

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                     |           | £. s. d. | £. s. d. |
|---------------------------------------------|-----------|----------|----------|
| Greenheart, B.G.                            | ton       | 6 10 0   | 7 10 0   |
| Teak, E. I., load                           | 100       | 0 10 0   | 14 0 0   |
| Sequoia, U.S.                               | foot cube | 0 2 3    | 0 3 0    |
| Ash, Canada                                 | load      | 3 10 0   | 5 0 0    |
| Birch                                       | do        | 3 10 0   | 6 0 0    |
| Elm                                         | do        | 4 0 0    | 5 0 0    |
| Fir, Dantico, &c.                           | do        | 2 0 0    | 4 0 0    |
| Oak                                         | do        | 2 0 0    | 4 10 0   |
| Canada                                      | do        | 5 10 0   | 7 0 0    |
| Pine, Canada red                            | do        | 0 5 0    | 4 0 0    |
| " yellow                                    | do        | 3 10 0   | 6 10 0   |
| Lath, Dantico                               | fathom    | 4 10 0   | 5 10 0   |
| Peck, Peterburg                             | do        | 5 0 0    | 6 10 0   |
| Wainscot, Ely, &c.                          | do        | 2 15 0   | 4 5 0    |
| " Odessa, crown                             | do        | 2 15 0   | 3 5 0    |
| Deals, Finland, 2nd and 1st                 | std. 100  | 0 9 0    | 10 0 0   |
| " 4th and 3rd                               | do        | 7 0 0    | 8 10 0   |
| " 2nd                                       | do        | 7 0 0    | 8 10 0   |
| St. Petersburg, 1st yellow                  | do        | 10 0 0   | 15 0 0   |
| " 2nd                                       | do        | 9 0 0    | 10 0 0   |
| Sweden                                      | do        | 7 10 0   | 10 0 0   |
| White Sea                                   | do        | 8 10 0   | 17 0 0   |
| Canada, Pine, 1st                           | do        | 18 0 0   | 26 10 0  |
| " 3rd                                       | do        | 15 0 0   | 22 0 0   |
| " 3rd & 2nd                                 | do        | 7 10 0   | 10 10 0  |
| " Spruce, 1st                               | do        | 9 10 0   | 10 10 0  |
| " 3rd and 2nd                               | do        | 7 0 0    | 8 10 0   |
| N. Brunswick, &c.                           | do        | 6 15 0   | 8 15 0   |
| Battens, all kinds                          | do        | 5 10 0   | 12 0 0   |
| Flooring Boards, sq. 1 in., prepared, first | do        | 0 11 0   | 0 14 6   |
| Second                                      | do        | 0 8 0    | 0 10 8   |
| Other qualities                             | do        | 0 5 6    | 0 7 8    |
| Cedar, Cuba                                 | foot      | 0 0 3    | 0 0 4    |
| Honduras                                    | do        | 0 0 3    | 0 0 4    |
| Australia                                   | do        | 0 0 3    | 0 0 4    |
| Mahogany, Cuba                              | do        | 0 0 4    | 0 0 6    |
| St. Domingo, cargo average                  | do        | 0 0 4    | 0 0 6    |
| Mexican                                     | do        | 0 0 4    | 0 0 6    |
| Mahogany, Tobacco, cargo average            | do        | 0 0 4    | 0 0 6    |
| Honduras                                    | do        | 0 0 4    | 0 0 6    |
| Bor, Turkey                                 | ton       | 5 0 0    | 12 0 0   |
| Best selected                               | do        | 7 10 0   | 0 0 0    |
| Bahia                                       | ton       | 12 0 0   | 18 0 0   |
| Statin, St. Domingo                         | foot      | 0 0 6    | 0 1 0    |
| Porto Rico                                  | do        | 0 0 9    | 0 1 3    |
| Walnut, Italian                             | foot      | 0 0 4    | 0 0 6    |

| METALS.                    |     | £. s. d. | £. s. d. |
|----------------------------|-----|----------|----------|
| Iron—Bar, Welsh, in London | ton | 4 17 6   | 5 0 0    |
| " do, at works in Wales    | do  | 4 15 0   | 5 0 0    |
| " do, in London            | do  | 5 15 0   | 7 0 0    |
| COPPER.                    |     |          |          |
| British, cast and ingot    | ton | 79 0 0   | 79 10 0  |
| Best selected              | do  | 83 0 0   | 85 0 0   |
| Sheets, strong             | do  | 83 0 0   | 85 0 0   |
| Chili, bars                | do  | 78 0 0   | 80 0 0   |
| Galvanized Metal           | lb. | 0 0 7    | 0 0 7    |
| LEAD.                      |     |          |          |
| Sheet, English             | ton | 14 10 0  | 0 0 0    |
| SPRINKLER.                 |     |          |          |
| Shelton, special           | ton | 18 7 6   | 18 10 0  |
| Ordinary brands            | do  | 18 5 0   | 18 7 6   |
| STEEL.                     |     |          |          |
| Strait                     | ton | 98 10 0  | 0 0 0    |
| Australian                 | do  | 98 10 0  | 0 0 0    |
| English Ingots             | do  | 101 0 0  | 0 0 0    |
| Sheet, English             | ton | 21 0 0   | 23 0 0   |

| OILS.                  |     | £. s. d. | £. s. d. |
|------------------------|-----|----------|----------|
| Lined                  | ton | 18 5 0   | 18 7 6   |
| Cocount, Ceylon        | do  | 28 0 0   | 30 0 0   |
| Ceylon                 | do  | 27 5 0   | 27 10 0  |
| Palm, Lagos            | do  | 28 10 0  | 0 0 0    |
| Rapeseed, English pale | do  | 31 15 0  | 32 0 0   |
| " brown                | do  | 30 10 0  | 0 0 0    |

| OILS (continued).   |        | £. s. d. | £. s. d. |
|---------------------|--------|----------|----------|
| Cottonseed, refined | do     | 28 0 0   | 0 0 0    |
| Tallow and Olene    | do     | 19 0 0   | 46 0 0   |
| Lubricating, U.S.   | do     | 5 0 0    | 5 0 0    |
| " refined           | do     | 7 0 0    | 12 0 0   |
| Tar—Stockholm       | barrel | 1 2 0    | 1 2 6    |
| Archangel           | do     | 0 13 0   | 0 0 0    |

## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

### CONTRACTS.

| Nature of Works, or Materials.               | By whom Required.        | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------------|--------------------------|-----------------------------------|--------------------------|-------|
| Making-up and Paving Road                    | St. Mary (Battersea)     | J. T. Pilditch                    | Jan. 22nd                | ii.   |
| Roadmaking Works                             | Levisham Bd. of Wks.     | Official                          | do.                      | ii.   |
| Road Paving                                  | West Ham Council         | Lewis Angell                      | do.                      | xi.   |
| Making-up Roads, &c.                         | Felixstowe, &c. Loc. Bd. | P. Oldfield                       | Jan. 23rd                | ii.   |
| Road Materials, Royal Parks                  | Com. of H. M. Works      | Official                          | Jan. 25th                | ii.   |
| Post Office, North Shields                   | do.                      | do.                               | Jan. 25th                | xi.   |
| Repairing and Altering Five Houses           | Conservative Land Soc.   | Not stated                        | do.                      | xi.   |
| Paving Works                                 | Wandsworth Bd. of Wks.   | Official                          | Jan. 26th                | xi.   |
| Drainage and Sewer Work                      | Chelsea Vestry           | do.                               | do.                      | xi.   |
| Broken Granite, Sittings, Flints, and Gravel | Dover Town Council       | do.                               | do.                      | xi.   |
| Timber                                       | Great Western Ry. Co.    | do.                               | do.                      | xi.   |
| Extension of Waterworks                      | Cheltenham Corporatn.    | Mr. McLandborough                 | do.                      | xii.  |
| Waterworks                                   | Manfield U. S. Bd.       | Herbert Walker                    | Jan. 30th                | xi.   |
| Furnace, with Boiler, Engine, and Machinery  | Hornsey Local Board      | T. de Courcy Meade                | Feb. 4th                 | xi.   |
| Making-up Roads, Rochester                   | Chelsea Guardians        | A. & C. Harston                   | Feb. 6th                 | xi.   |
| Repairs to Roof, Han Water Pipes, &c.        | W. W. Cookrell           | J. W. Cookrell                    | Feb. 7th                 | xi.   |
| Concrete Paving                              | Warwick Town Council     | E. M. Richards                    | Feb. 9th                 | xi.   |
| Waterworks Extension                         | Hauwell Local Board      | E. J. W. Herbert                  | Feb. 18th                | xi.   |
| Additional Subdividing Tanks, Carriers, &c.  | War Department           | Official                          | Mar. 4th                 | ii.   |
| Works, Repairs, and Supply of Building Mat.  | Mot. Bd. of Works        | do.                               | Mar. 15th                | ii.   |
| Footway Tunnel across and under E. Thames    | School Bd. for London    | do.                               | Not stated.              | xi.   |
| Annual Repairs to Buildings and Furniture    |                          |                                   |                          |       |

### PUBLIC APPOINTMENTS.

| Nature of Appointment.                       | By whom Advertised.   | Salary.              | Applications to be in. | Page. |
|----------------------------------------------|-----------------------|----------------------|------------------------|-------|
| Surveyor                                     | Shanghai Mun. Council | 3,800 taels          | Jan. 28th              | xvii. |
| Head Mechanical Draughtsman                  | Government of India   | 250 Rupees per month | Feb. 4th               | xvii. |
| Engineer Students and Students in Naval Con. | C. S. Commission      | Not stated           | March 15th             | xvii. |

### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursday.]

**BEDFORD.**—For the erection of new Conservative Club premises, Bedford, for the Directors of the Bedford Conservative Club House Company, Limited. Mr. James Hall, architect and surveyor, 17, St. Paul's-square, Bedford.

|            |             |
|------------|-------------|
| Age        | £2,881 14 3 |
| Corb       | 2,808 0 0   |
| Cherry     | 2,800 10 0  |
| Foster     | 2,587 0 0   |
| Freshwater | 2,538 0 0   |
| Gell       | 2,538 0 0   |
| Smith      | 2,539 0 0   |
| Steers     | 2,479 0 0   |
| Laughton   | 2,458 0 0   |
| Coleman    | 2,424 17 8  |
| White      | 2,387 0 0   |

**BLACKHEATH.**—For supplying fittings to Blackheath Post-office, for her Majesty's Office of Works. Mr. E. H. Boyce, architect—

J. O. Richardson, Albert Works, Peckham, S.E. (accepted) £109 12 0

**BROMLEY (Kent).**—For making up New Homedale-road, for the Bromley Local Board. Mr. Hugh S. Creggan, Surveyor—

E. Peill & Sons. £307 5 4

T. Lansbury (accepted) 297 6 2

**BUILTH.**—For house in Castle-street, Builth, for Mr. Evan Evans—

Williams, Knighton 2634 0 0

Evans, Erwood 510 0 0

Meredith, Newbridge 498 0 0

H. Price, Builth (accepted) 497 10 0

J. M. Jones, Builth 498 0 0

**CHARLTON (Kent).**—For the erection of Wesleyan Chapel, Lower-road, Charlton. Mr. H. H. Church, architect, Woolwich. Quantities by Mr. W. H. Strudwick—

Parker, Peckham £5,137 0 0

Holt, Croydon 5,109 0 0

Staines & Co., Great Eastern-street 4,944 0 0

Proctor, Woolwich 4,885 0 0

Coxhead, Leytonstone 4,845 0 0

Higgs, Loughton Junction 4,800 0 0

Stephenson, Bishopsgate 4,785 0 0

Bailey, Old Kent-road 4,697 0 0

Frank B. Smith, Greenwich 4,684 0 0

Wallis & Sons, Maidstone 4,533 0 0

Tyson, Kensington 4,478 19 0

Holloway, Lavender-hill 4,450 0 0

Shillitoe & Sons, Bury St. Edmunds 4,450 0 0

Henley & Co., Norwood 4,397 0 0

Ward Worthingham, Surrey 4,379 0 0

Robson, Lewisham 4,367 0 0

Richardson, Peckham 4,369 0 0

Holloway, New-cross 4,343 0 0

Allen & Sons, Kilburn 4,290 0 0

Covill, Woolwich 4,200 0 0

Wells, Bermondsey 4,200 0 0

Mutton & Wallis, Gravesend 4,175 0 0

Kemp, Aldershot 4,089 0 0

**CHELTHAM.**—For the erection of village chapel at Shipton Olive. Messrs. Kerley & Ellis, architects, Exmouth—

Hayman, Exmouth (accepted) £218 6 6

[Lowest of six tenders received.]

**CHESHUNT.**—For making-up roads, for the Cheshunt Local Board. Mr. Thos. Bennett, engineer—

Henry Potter, Lower Clapton £2,060 0 0

F. Sanders, Cheshunt 2,387 0 0

J. Jackson, Enfield 1,987 0 0

J. Dixon, St. Albans 1,698 0 0

J. Bromfield, Tottenham 1,332 0 0

G. Bell, Cheshunt 1,680 0 0

H. Morris, Dalston (accepted) 1,360 0 0

**CROYDON.**—For alterations at the Friends' Meeting Room. Mr. W. C. Reed, architect—

Smith & Bulled £119 0 0

Gouldier & Glasscock 106 0 0

**CROYDON.**—For alterations to shop-front, and for erecting new green-house, Derby-road, for Mr. J. E. Box. Mr. F. West, architect—

Shop-front. Greenhouse.

Pearce £23 0 0 £170 0 0

Page 38 0 0 157 0 0

Waller 24 0 0 127 0 0

Gouldier & Glasscock 29 0 0 107 0 0

Smith & Bulled £3 15 0 99 10 0

**ENFIELD.**—For erecting workroom at Enfield Union, for the Edmonton Board of Guardians. Mr. T. E. Knightly, architect, 106, Cannon-street—

Hart £328 0 0

Nottingham 320 0 0

Humphries 316 10 0

Wilson & Co., Limited 238 10 0

Torolds 295 0 0

Reynolds 289 0 0

Pavey, Winchmore-hill 270 0 0

Linnell, Tottenham 261 0 0

Littlefield, Enfield 256 10 0

Brooks, Enfield (accepted) 235 0 0

**EXMOUTH.**—For the erection of coachhouse and stable at "Lawnside," for Mrs. Arthur Thompson. Messrs. Kerley & Ellis, architects, Exmouth—

Webber, Exmouth £147 0 0

West, Exmouth 139 0 0

Stokes, Exmouth 115 0 0

Tozer, Exmouth 109 9 0

Hayman, Exmouth (accepted) 73 13 0

**EXMOUTH.**—For the erection of shop and house in the Victoria-road, for Mr. E. Ellett. Messrs. Kerley & Ellis, architects, Exmouth—

Cooper & Son, Exmouth £350 0 0

Pring, Exmouth 330 0 0

Ponsford, Exmouth 320 0 0

Hayman, Exmouth 319 18 0

Ferry, Exmouth 290 0 0

Stokes, Exmouth 280 0 0

Tozer, Exmouth 215 15 0

Hooper, Exmouth (accepted) 214 0 0

Webber, Exmouth 188 0 0

**HAMPSTEAD.**—For finishing four houses in Glenbrook-road, West Hampstead, for Mr. F. Ridley. Mr. Walter Hall, surveyor, Chancery-lane, W.C.—

W. & B. Bardell (accepted) £700 0 0

**HORDLE (Hants).**—For erecting new vicarage. Mr. R. C. Reade, M.A., architect, Torquay—

Rashley Bros., Lynton £2,026 11 0

**LEWISHAM.**—Accepted for kerbing, channelling, paving, and making-up roads, for the Lewisham Board of Works—

Brownhill road £1,049 0 0

Plasy-road 493 0 0

Woodham & Fry 229 0 0

Nightingale-grove 229 0 0

Maythorn-cottages 187 0 0

Maybank-cottages 189 0 0



**LONDON.**—For taking down and rebuilding the "Albany Tap" beer-house, Albany-road, Camberwell, Mr. G. Treacher, Architect:—

|                               |            |
|-------------------------------|------------|
| Burman & Sons.....            | £2,100 0 0 |
| Nile.....                     | 2,100 0 0  |
| Turtle & Appleton.....        | 2,080 0 0  |
| Beale.....                    | 1,988 0 0  |
| Tyerman.....                  | 1,935 0 0  |
| Croker.....                   | 1,925 0 0  |
| Spence & Co.....              | 1,900 0 0  |
| Lobb & Oliver (accepted)..... | 1,821 17 0 |

**LONDON.**—For altering the position of iron gates, piers, &c., erecting new oak fencing, and other works, at the Blackstock-road entrance of Finsbury Park, for the Metropolitan Board of Works, Mr. Thomas Blashill, architect. Quantities not supplied.—

|                     |          |
|---------------------|----------|
| F. Blanford.....    | £367 0 0 |
| C. Killingback..... | 330 0 0  |
| Faulkner.....       | 298 0 0  |
| Edwards.....        | 280 0 0  |

**LONDON.**—For alterations, &c., to the "William the Fourth," King William-street, Strand, W.C., for Messrs. Drew & Street. Mr. E. I. Newton, architect, St. Margaret's Offices, 49, Victoria-street, Westminster, S.W.—

|                                                   |            |
|---------------------------------------------------|------------|
| J. Veas & Co., Hyde-park.....                     | £1,333 0 0 |
| Drew & Cadman, Holborn.....                       | 1,168 0 0  |
| O. F. Hewlett, City.....                          | 1,037 0 0  |
| E. Stanton, Wimbledon.....                        | 1,029 0 0  |
| S. R. Lambie, Kentish Town.....                   | 1,029 0 0  |
| H. Burman & Sons, Kennington-park (accepted)..... | 887 0 0    |

**LONDON.**—For the erection of offices, 5, Salter's Hall-court, for Mr. George J. Woodman. Mr. Edmund Woodthorpe, architect, 1, Circus-square, E.C. Quantities by Messrs. Franklin & Andrews, 25, Ludgate-hill.—

|                                |        |
|--------------------------------|--------|
| Collis & Sons.....             | £1,900 |
| Dove Bros.....                 | 1,896  |
| Kider & Sons.....              | 1,818  |
| Shepherd.....                  | 1,645  |
| Harrison & Spooner.....        | 1,774  |
| Lawrence & son.....            | 1,670  |
| Mark Gentry.....               | 1,460  |
| Hawgood.....                   | 1,573  |
| Larkin & Son.....              | 1,600  |
| Ashby & Horner (accepted)..... | 1,585  |

**LONDON.**—For the erection of workshop at 107, Upper Grange-road, Bermondsey, for Mr. R. Stronfeld. Mr. L. R. Ford, architect, 24, Railway-approach, London Bridge, S.E.—

P. Drake (accepted)..... £223 0 0

**NEWQUAY** (Cornwall).—Accepted for the erection new villa residence, for Mr. W. Phillips. John Harvey, St. Austell, mason and bricklayer, plasterer, slater, &c.— £326 0 0

James Julian, Truro, carpenter and joiner, plumber, smith, &c.— 300 0 0

(All gates, chimney-pieces, &c., supplied)

**NORTHAMPTON.**—For erecting new shop, Kettering-road, Northampton, for Messrs. W. H. Dyer & Son, architects, Northampton:—

|                                  |          |
|----------------------------------|----------|
| G. Fisher.....                   | £750 0 0 |
| W. Rickinsonham, Tiddington..... | 705 0 0  |
| A. P. Hawtin.....                | 698 0 0  |
| J. T. Wingrove.....              | 685 0 0  |
| H. Martin.....                   | 684 0 0  |
| J. Pettitt.....                  | 650 0 0  |
| Green Brothers.....              | 634 0 0  |
| W. Heap (accepted).....          | 575 0 0  |

\* Best of Northampton.

**PENDLETON.**—For the erection of St. Thomas's new school:—

|                               |            |
|-------------------------------|------------|
| John L. Ward, Manchester..... | £2,250 0 0 |
|-------------------------------|------------|

\* Accepted.

**PLUMSTAD.**—For additions to Woolwich Union Infirmary, Plumstead, for the Board of Guardians of the Woolwich Union. Mr. J. O. Cook, architect. Quantities supplied by Mr. C. W. Brooks:—

|                                                               |            |
|---------------------------------------------------------------|------------|
| J. O. Richardson, Albert Works, Peckham, S.E. (accepted)..... | £3,724 0 0 |
|---------------------------------------------------------------|------------|

[For full list of tenders see last week's Builder, p. 40.]

**PORTELLEVEN** (Cornwall).—For erecting new porches, decorating, part new seating, new rostrum, &c., to the Bible Christian Chapel, for the Trustees. Mr. W. White, architect, Penzance:—

|                                     |          |
|-------------------------------------|----------|
| James Julian, Truro (accepted)..... | £260 0 0 |
|-------------------------------------|----------|

**ST. AUSTELL** (Cornwall).—For additions to Moor Cottage, for Mr. Edward Cooke. Mr. W. Sambles, architect, Fowey:—

|                                     |          |
|-------------------------------------|----------|
| James Julian, Truro (accepted)..... | £230 0 0 |
|-------------------------------------|----------|

**SALFORD.**—For the erection of St. Margaret's new schools for infants:—

|                                |            |
|--------------------------------|------------|
| John L. Ward, Manchester*..... | £1,313 0 0 |
|--------------------------------|------------|

\* Accepted.

**SHOREHAM** (Kent).—For alterations, additions, and repairs to the "Crown Inn," Shoreham, Kent, for Messrs. A. Smith & Co. Mr. Thomas Potter, architect, Seven-oaks, Kent:—

|                           |          |
|---------------------------|----------|
| E. Sevan.....             | £234 8 8 |
| G. Wood.....              | 310 0 0  |
| H. Owen.....              | 302 10 0 |
| Wiltshire (accepted)..... | 294 0 0  |
| G. Budgen.....            | 195 0 0  |

**SIDMOUTH.**—For the erection of shops and premises in Old Fore-street, for Messrs. Peppercell & Maser, Messrs. Kerley & Ellis, architects, Exmouth:—

|                                     |            |
|-------------------------------------|------------|
| Hooper, Exmouth.....                | £1,967 0 0 |
| Searle, Sidmouth.....               | 1,963 0 0  |
| Bucknell, Sidmouth.....             | 1,840 0 0  |
| Holmes, Exeter.....                 | 1,810 0 0  |
| Perry, Exmouth.....                 | 1,485 0 0  |
| Turner & Skinner, Honiton.....      | 1,456 0 0  |
| Hayman, Exmouth.....                | 1,354 0 0  |
| Critchley, Sidmouth (accepted)..... | 1,300 0 0  |

**STACKSTEDS** (Lancashire).—For additions to house, lodge, and entrance-gates, for Mr. R. W. Munn, J.P., Heath Hill. Messrs. E. & F. Hewitt, architects and surveyors, 9, Albert-square, Manchester:—

|                      |            |
|----------------------|------------|
| W. Brown & Son.....  | £1,437 0 0 |
| R. Noll & Sons.....  | 1,370 0 0  |
| J. W. Sutcliffe..... | 1,368 5 0  |
| James Ashworth.....  | 1,360 0 0  |
| Simon Johnson*.....  | 1,250 0 0  |

\* Accepted conditionally.

**TRURO.**—For the erection of cottage dwelling-house at Koa, near Truro, for Mr. James Old, of Truro. (All building stone and granite supplied):—

|                                     |          |
|-------------------------------------|----------|
| James Julian, Truro (accepted)..... | £207 0 0 |
|-------------------------------------|----------|

#### TO CORRESPONDENTS.

A. D. D.-F. C. P.-R. B. & Son.-G. St. P. H.-J. M. F.-W. H. W. (too late for this week).

All statements of facts, rates of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline publishing out books and giving addresses. NOTE.—In responsibility of square articles, and papers read at public meetings, rate, of course, with the authors.

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### The Old Hôtel de Ville, Paris.



IN the present number we publish a view, taken from an old photograph, of the former Hôtel de Ville of Paris; the memory of which, though it is not so many years since its destruction, seems already almost obliterated by the splendours of the new building, on the decoration of which the efforts of all the leading artists of France are to be concentrated. A record of the building which preceded it, interesting as it was both architecturally and historically, will, perhaps, be of value hereafter, and may be of interest now to those who remember it as an old friend; and to the representation of its architectural features, we propose to add a short sketch of its antecedents and its history.

The magistrates of Paris who, under the first kings of the Capets, used to assemble in a building near the Seine, called the "Maison de la Marchandise," established themselves afterwards in the "Parloir aux Bourgeois," which was at first situated near the Grand Châtelet, and afterwards at the extremity of the University, on the ground to-day occupied by the Rue Soufflot. A marble tablet affixed to a house in this street records the fact. In 1357 the officials of the City purchased, on the Place du Grève, the house "aux piliers," otherwise called the "Maison aux Dauphins," where the provosts of the various trades had their quarters up to 1532. As at this time the old house became dilapidated and unfit for further occupation, the provosts, who had become possessed of some of the adjoining property, bethought them of building a new Hôtel de Ville, of which Pierre le Viole, Seigneur d'Athis, who was councillor of the King and "Prévôt des Marchands," laid the first stone on the 15th day of July, 1533.

Most historians agree in attributing the architectural design of the building to Dominique of Cortona, called "Le Boccador," whose name has remained attached to the fine Renaissance façade which MM. Ballu and Deperthes have to a great extent reproduced in the new monument. M. Marius Vachon, however, in his interesting work on the "Hôtel de Ville," considers that he can prove, by authentic documents, that the edifice is entirely the work of Pierre Chamliges, a French architect,

"maître des œuvres de maçonnerie de la Ville de Paris et du Roy." He is the same architect who built the royal château of St. Germain-en-laye, the "cour du cheval blanc" at Fontainebleau, and the Château de la Muette (now destroyed). Dominique of Cortona, according to M. Vachon, was in reality only the architect of a portion of the ancien Maison de Ville, built under Francis I., before 1533, and which was transformed and absorbed in the buildings subsequently erected from the plans and designs of Pierre Chambiges.

We refer to this disputed point without undertaking to solve it, which, probably, it is impossible to do with certainty at the present time. It is sufficient to say here that the painted decoration of the Hôtel de Ville was entrusted to Charles, described as "peintre," and the sculpture to Thomas Choqueur, "tailleur d'images," at the price of 4 livres per room for sculpture or for painting. In 1549 the two stages of the central portion were scarcely completed. They were judged to be "trop Gothique," and the design was modified, presented to Henri II., then at St. Germain, and approved by him.

During the latter half of the sixteenth century the disturbances and massacres in Paris obliged the magistrates to suspend the work. But in the reign of Henri IV., François Miron, Prévôt des Marchands, carried out the entrance steps and portico, the staircases, the equestrian figure of the King, and the other decorations of the façade, with a disinterested spirit which would hardly be found among Parisian Ediles of the present day; for he advanced for the different works 900 livres out of his own funds, and gave up more than 2,200 livres of rights or commissions attached to his office. The statue of the King, destroyed during the first Revolution, passed for the *chef d'œuvre* of Biard the elder, a pupil of Michelangelo. The bas-relief shown in our photograph, above the central door, was cast in bronze from a model by Lemot, and put up in 1836. Partially destroyed in the incendiarism of 1871, the fragments are now preserved in the Carnavalet Museum. The general works of the Hôtel de Ville, recommenced in 1605, were until 1623 directed by Marin de la Vallée, a Parisian architect. But from that time till the reign of Louis XV., almost the sole attention was given to the interior decoration, which was carried out in a very costly and luxurious manner.

Towards the close of the seventeenth century, the old buildings having been for a long time inadequate for their requirements, the question was many times debated of pulling down and removing the Hôtel de Ville. But the Parisian people were so little pleased with this idea that the authorities had to confine themselves to a vote, in 1770, for the enlargement of the municipal palace. Want of funds interfered with the carrying out of this project, and things remained *in statu quo* until the time of the Consulate, at which the Prefecture of the Seine was installed in the Hôtel de Ville, to which were joined the buildings of the ancient church of St. Jean. From this time dates the construction of the immense "Salle de reunion publique," otherwise called the "Salle St. Jean."

Napoléon, who was already dreaming of schemes for a transformation of Paris, which (or something very like it) was to be accomplished nearly half-a-century later under the rule of his nephew, wished to build a new Hôtel de Ville on the Place de Grève, with its principal façade towards the Seine. According to this project, the cost of which was estimated at 25 million francs, the Place de Grève was to be put into communication with Notre Dame by a monumental bridge. The restored Monarchy rejected this ambitious plan, and gave itself no further concern about the Hôtel de Ville, which remained enclosed within a labyrinth of narrow, winding, and unhealthy lanes, of which the rue de l'Hôtel de Ville, rue Grenier sur l'eau, and rue Cloche, constitute to-day the only specimens remaining. It was not till 1836 that the enlargement of the old building was, in the reign of Louis Philippe, determined upon, and the work entrusted to MM. Godde and Lesueur. This operation, completed in 1846, had cost more than twelve millions. Lastly, in 1868, M. Max Vauthier was commissioned to rebuild, but on a larger scale, the campanile of the principal façade built in 1608. This was the new campanile which figures in our illustration.

The continuation of the Rue de Rivoli through the old quarters had for one of its results to open out the Hôtel de Ville, the Place adjoining which was raised, enlarged, reduced to symmetrical lines, and duly sanitarized. The reign of Napoléon III. was the brilliant epoch of *fêtes* and balls, given under the administration of Baron Haussmann, to whom the Paris of the present day owes its predominant characteristics. In 1856, when Queen Victoria visited Paris, the inauguration



took place of the large avenue opened on the axis of the principal façade of the palace, and which now bears the name of the Avenue Victoria. Later, during the Exhibition of 1867, the greater number of the sovereigns of Europe were received with great pomp at the Hôtel de Ville, and the marvellous fête given there at that time to the Czar, the King of Prussia, the Emperor of Austria, and the Sultan Abdul-Aziz, were things not to be forgotten by those who witnessed them.

Then came the dark times of the war. At the time of the 31st October, 1870, and 22nd January, 1871, the Government of the National Defence, which had taken refuge in the Hôtel de Ville, had to support the siege of the battalions of Belleville under the direction of Florens. Then followed the Commune, and during the sanguinary week in May, 1871, the insurrectionists flooded with petroleum the ancient cradle of municipal liberty, and set it on fire. The fire lasted eight days; in spite of the devoted efforts of the corps of firemen, recruited from the provinces and even from London, all was consumed. There remained no more of the monument except the burnt and blackened blocks of wall standing around the empty spaces, and the smoking ashes, among which could be picked up here and there fragments of bas-reliefs and columns, the debris of statues, remains of gold-work and jewelry, and the medals which are now collected in the Carnavalet Museum. One cannot, even in this rapid and comprehensive sketch, pass over without mention the numerous things of artistic value which disappeared amid the flames lighted by the Commune. At the very centre of the edifice, in the Cour Louis XIV., which on fête-days was transformed by a glazed covering into a winter-garden, was a statue of Louis XIV. by Coysevox. This had, happily, partially escaped, and is now restored and preserved in the new museum of Auteuil. But the splendid staircase constructed by Baltard, and which was used only for the passage of sovereigns, has gone, and Balla, for whatever reason, made no attempt to replace this in his new building. Among the other works which were destroyed, the following may be mentioned: In the Salle du Trône, the equestrian portrait of Napoléon III., by Horace Vernet; in the Salle du Conseil Municipal, four fine compositions by Yvon, reproducing scenes from the life of Clovis, Philip Augustus, Francis I., and Napoléon III.; in the gallery of the Secretariat, eight views of Paris, painted by Lecomte, Paul Flandrin, Desgoffe, Bellel, and Hédouin. Fortunately, the eight landscapes by Hubert Robert, formerly in the *Salon de Marbre*, were saved, and are at the present moment in the reception-rooms of the Prefect of the Seine.

In the Salon de l'Empereur was the celebrated ceiling by Ingres, representing the apotheosis of Napoléon, which has been rendered popular by engraving. In the same room was the portrait of Napoléon by Baron Gérard, also a splendid bust of Napoléon III. in *aqua marina* beryl, a *chef-d'œuvre* of artistic lapidary work, executed in 1867 by Froment Meurice. The Salon du Zodiaque was decorated by Léon Cogniet with allegorical compositions representing the four seasons. The wood-carvings below, attributed to Jean Goujon, reproduced the corresponding allegorical personages representing the signs of the Zodiac. The *salle à manger* was decorated with paintings by Jadin; the Salon des Cariatides was painted by Cabanel and Benonville. In the large Salle des Fêtes, Lehmann had executed twenty-eight grand compositions, symbolising in some sort the progress of the human mind from primitive times to those of modern civilisation. We may mention also the allegorical ceilings by Picot, Landelle, Müller, Hesse, and Riesener, not forgetting also the decoration of the Salon de la Paix, an admirable work by Eugène Delacroix, of which the museum at Auteuil careful preserves some original sketches. We may add that in the old principal façade there were

forty-six niches, disposed in three groups, and decorated with statues of celebrated Parisians.

The old Hôtel de Ville contained also a very rich library, and many valuable archives and records, which have all disappeared. At the time of the fire, the library included 80,000 volumes, many thousands of manuscripts, and from 19,000 to 20,000 monographs of Paris, from the first proof of Gilles Corrozet, published in 1532, down to the last books on the subject published on the eve of the Commune insurrection. It possessed also the plan of Paris called the plan "de la Tapisserie," executed in 1540, the plan of Du Cerceau, and finally the celebrated missal of Juvénal des Ursins, given to the city by M. Firmin Didot, and which contained nearly 200 wonderfully executed miniatures, the destruction of which is an irreparable loss to French art and artistic history.

The municipal archives were not less interesting, and archaeologists found there, among other treasures, the whole of the records and registers of the ancient Parisian trade guilds. The register of the Merciers' Guild was particularly remarkable. The morocco binding with wrought-iron decoration, representing the arms of the Corporation, was in itself a masterpiece. Many pages were decorated with miniatures representing episodes in the life of St. Louis, the patron of the Corporation; his departure for the crusades, his embarkation at Aigues Mortes, his landing in Egypt, and his death. The finish of execution, both in drawing and colouring, rendered these water-colours works of high artistic value.

Of so many works which had been accumulating for centuries there remains now, alas, nothing but the recollection. But since the mischief wrought by this short but violent civil war, a new building has slowly arisen on the ruins of the old Maison de Ville, and on its façade, adorned with decorations by the first artists of the modern school, there is still seen the proud and consolatory motto, attached to the device of the ship which symbolises Paris: "Fluctuat nec mergitur."

#### THE PSYCHOLOGICAL BASIS OF ART.\*

FROM time to time the tendency of men to speculate upon the reason why they enjoy one thing in art and disapprove of another has shown itself outwardly in the production of treatises professing to furnish the key to these operations of the mind, and to explain why we like this and dislike that, though it is not very often that architects have thus appeared in the ranks of the psychologists. They have mostly been occupied with more practical problems. The author of the treatise before us may, at all events, make the same claim for leniency towards his work which Lot made in regard to Zorn: "Is it not a little one?" for his treatise is but in three chapters of moderate length, and may fairly be said to contain a good deal of thought within the narrow limits of those three chapters. The worst of it is that, like more ponderous treatises of the same kind, it seems to prove nothing, except that its author is a man of cultivated and thoughtful mind, who has some ideas on the subject, and is able to clothe them in well-chosen language.

Mr. Granger takes for his text the sentence from Lessing, the general truth of which few people will question,—viz., that "the object of the Fine Arts is to give pleasure" ("Der Endsweck der Künste ist Vergnügen"). With the conviction of this comes (to some persons, at least) the temptation to analyse that pleasure and see what it is made of,—a pursuit of which we will only say that it appears to us to be an effort to analyse and define what

is in its nature indefinable, and the analysis and definition of which, if we succeeded in making it, would add nothing to our enjoyment of art, but rather take away from it. It is an effort to find out what you cannot find out, and the finding out of which, if you could achieve it, would destroy the very joy you are anxious to get better acquainted with. Mr. Granger's contention in his first chapter is that "just as play" (in the physical sense) "gives pleasure to the active side of mind, so the Fine Arts give pleasure to the receptive side of mind." . . . While, therefore, the pleasures of bodily exercise, of gymnastics, are attached to the muscular sense, the pleasures of Fine Art are attached to the senses by which are received impressions from the outer world." And the author proceeds to note that some impressions from the outer world, some sounds, for instance, are pleasant in themselves, such as the singing of song-birds, and the notes of a musical instrument; while others, such as the cawing of rooks or the moaning of the wind, are sounds of which the pleasurable effect is only indirect; they suggest certain ideas on which the mind finds a pleasure in dwelling. This is true in itself, but we are no nearer, after all, the reason why the mind finds pleasure in dwelling on them, even if we wished to analyse it, which we, for our part, do not.

The subject begins to have somewhat more semblance of a definite end and meaning in some of the conclusions which the author draws from his views as to the manner in which our perceptions are affected by works of art. "Since the pleasure which it is the artist's aim to produce is the goal to which innumerable tendencies lead the mind, and since some tendencies are more easily than others followed out by consciousness, one rule of Fine Art must be to suggest the former in preference to the latter." . . . "The strength of a tendency in consciousness depends partly on the intensity of the original feelings on which it is based, partly in the absence of conflicting tendencies." Hence, there may be deduced the following condition of emotional pleasure. A train of feeling, in the first place, will be pleasant in proportion to the readiness with which its terms follow each other through consciousness." We should question that proposition very much. The ideas of the White-chapel murderer and of a gibbet follow each other very readily through our consciousness, but they do not constitute a pleasurable train of feeling. But to proceed to the more direct application of the theory: "Works of art depend for much of their effect on their familiarity of the associations aroused by them. Since the strongest associations in the mind correspond with the most general associations among external phenomena, a general truth to nature" (not a special or particular realism of detail, that is to say) "will characterise all noble art." That is very well put. The highest art and the highest artistic expression takes note of the broad facts and associations and omits the little details. Fechter made Othello let himself in with a latch-key to murder Desdemona; the trivial incident at once weakens the tragedy. Wordsworth concludes a splendid sonnet on watching a ship at sea with the line,—

"On went she, and due north her journey took,"  
If he had said—

"And north by east, a little north, her course soon shaped,"

he would have vulgarised the whole thing at once by directing attention away from the wide, vague idea of "sailing due north," to the paltry professional one of shaping a precise course by the points of the compass, a mere answer to the question, "How's her head?" So in painting: we are now in a realistic age (though a few chosen spirits protest against it), and we lower to the commonplace what might have been a poetic picture by forcing the attention on prosaic details. Apart from that, it seems to us that Mr. Granger's con-

\* "Notes on the Psychological Basis of Fine Art." By Frank Stephen Granger, M.A., A.R.I.B.A. James Bell, Nottingham, 1887.



tention is only putting in another way what has been over and over again said about works of art, that to be impressive they require to possess in the first place character, that is, initial intensity of expression; and in the second place, unity of conception, that is, an absence of conflicting elements, or, as Mr. Granger puts it, a series of terms which "readily follow one another through consciousness." There is nothing new in the thought; there is something new in the way of putting it, which is in itself a gain, for we always are in a way to learn something by turning an old idea about and looking at it in a new light.

Chapter II., "On certain Terms which are used in the Criticism of Works of Art," contains some good points. The author returns, in other language, to the idea previously suggested, that the great and simple relations of art to nature are the basis of the highest art. "The simple relations of father and son, husband and wife, and so forth, will last as long as the race, and the noblest art can do no more than rend the veil which civilisation throws round the first conditions of happiness." . . . Artificial things, "changing with every age and people, and without life, have but a passing interest compared with the permanence of natural forms. *Fashion is maritistic because it is mutable.*" The author deserves a vote of thanks for that last sentence; it is a truth admirably put. Hence the real greatness of the nude in art (provided it is fine work in itself); it is the eternal thing, the costumes are but toys, and costume itself rises in dignity as it drops realistic detail and rises to what may be called the normal idea of dress; something perfectly simple and ideal, unconnected with the fashions in detail of any special age or people.

A good deal of what the writer says about music and its artistic conditions is interesting and well expressed, but its consideration would lead us out of our field here. The author is right in entering a caveat against drawing out too far the resemblance between architecture and music, and makes a remark which might be taken to heart by some of the theorists who are anxious to prove that Greek temples were put together on a rule as rigid as that which governs the harmonic relation of sounds in music. He says this parallel between music and architecture, carried too far, "has been the origin of the absurd theories of proportion in architecture which have arisen since the Renaissance. The eye does not detect relation of magnitude with an accuracy at all like that of the ear in detecting relations of sound. Few eyes, if any, can see whether one line is precisely twice as long as another; yet a practised ear at once catches an imperfect octave, where the relation is of one to two." This we have repeatedly urged as against the "proportionist" people, and are glad to meet with the same argument from an independent quarter. Mr. Granger has, however, much less to say about architecture than one might have expected from an architect when dealing with philosophical reflections of this type. Some of the remarks on sculpture and painting show a very true spirit of criticism, especially those in regard to the treatment of the art of painting by Mr. G. F. Watts, and the spiritual and imaginative effect produced by his avoidance of mere mundane detail, as in his portraits of eminent men, which "gaze from their dark caskets on the wall like so many spirits."

The book is not essentially an architect's book in fact, or we should have followed it a little more in detail, and the positions laid down as to art would need a volume, or a good many volumes, to argue them out completely and judge them either right or wrong, and perhaps neither author nor critic would be nearer to a definite conclusion at the end of it all. But it is a pleasure to turn over a book which contains and suggests ideas in regard to the higher fields of artistic thought, and not the less so that the author is a member of the architectural profession, which has not on the whole made much contribution to psychology of any kind.

## NOTES.

**T**HE election of the London County Council on the 17th inst. resulted in the severe defeat of the Board of Works and Vestry candidates, with very few exceptions. Of twenty-eight members of the Metropolitan Board of Works who sought election on the County Council, only seven were returned, and the greater number of these were new members of the Board, and therefore not blame-worthy in any way for the recent scandals. No doubt some good and eligible men, with great experience, were sacrificed through the revulsion of feeling against the Board and all its works. But many capable men have been elected, though only a few of them are in any way eminent. Amongst these must be mentioned Sir John Lubbock and Lord Rosebery, who were elected at the top of the poll in the City Division. Lord Rosebery is freely spoken of as the probable Chairman of the new body. Mr. R. W. Edis, the well-known architect, was a successful candidate in the South St. Pancras Division. Mr. James Beal and Mr. Firth, who have for so many years fought for municipal reform in London, are very fittingly among the successful candidates. But a few exceedingly able men were defeated at the polls. Amongst these we may mention Mr. Archibald Dobbs, who with so much public spirit and indomitable perseverance some years ago fought, and won a victory over, the powerful vested interests of the London water companies; and Sir Thomas Farrer, whose administrative experience would be of great value to the new body, which has no light task before it. These two gentlemen should certainly be among the nineteen Aldermen who are to be "co-opted" at the meeting of the Provisional Council on Thursday next. The result of the elections did not add to the cheerfulness of the meeting of the Board of Works on the 18th inst., when the estimates for the first quarter of this year were propounded. Two members of the Board resigned their seats in dudgeon at their defeat as County Council candidates, and the ratepayers were given to understand that, if the Coal and Wine Dues be abolished (to which, as we understand, at least 70 of the 118 elected Councillors are pledged), the Metropolitan rates will be increased by about 2½d. in the pound. But, on the other hand, coal should be at least 1s. a ton cheaper.

**A** CASE was decided in the Court of Queen's Bench last week, in which the rights of railway companies as "warehousemen" was raised. The action was originally brought by a Mr. Ivens, against the Great Western Railway, who had sold three oak-trees of his, which had been on their wharf for about two years, to pay for the wharfage rent incurred (41l. 17s.). The case was tried before a judge and special jury, and decided in the plaintiff's favour; against which decision the railway company appealed. The usual advice had been issued to the plaintiff to the effect that the timber was held to his order, subject to the company's ordinary wharfage and demurrage charges, but he called witnesses to prove that such charges had not been made against other persons in the same trade in the same district; and it was held that the company was not entitled to exact a charge that was not uniformly made. It is rather singular that the judge at the first trial was Mr. Justice Wills, since appointed Railway Commissioner, and that the verdict then given has now been reversed. Mr. Justice Denman, in giving judgment last week, held that the plaintiff was bound by the terms fully set out on the advice-note, and that, although it was proved that the charges were sometimes waived, this was not a question for the court to consider. It certainly seems hard that in two years the timber should be swallowed up by wharfage expenses, but it would be no less hard for railway companies to be compelled to have their premises blocked up with their customers' goods for an indefinite period without

compensation. As this was made a County Court matter, the last decision is doubtless correct,—although it appears clear that the company have prejudiced the plaintiff in giving his competitors advantages which they have denied to him, and it seems probable that had the action taken another form, an injunction might have been obtained restraining them from so doing. The advice-notes always point out that the railway companies hold goods for instructions, "not as common carriers, but as warehousemen." But they are always under an obligation to refrain from giving any of their customers undue preference as railway companies,—that is, we take it, in either capacity. How far a railway company may forego such claims without laying themselves open is a very wide question. The evidence in this case, however, goes to show that they do sometimes "make fish of one and fowl of another," and that if goods are left on their hands too long they are in danger of being "annexed."

**A** LETTER from "Ouida" in the *Times* of Saturday last recounts,—with indignation which is natural and virtuous, if all the circumstances are as she narrates,—a project which is on foot for rebuilding a great portion of old Florence, involving the destruction of a great many old buildings, not of the first fame certainly, but of great historical interest. According to "Ouida" the proposed changes would involve the practical destruction of mediæval Florence, and the change is set on foot "because a few householders are greedy to sell their ground," but further on she states that the scheme is defended by "the parrot-chatter of hygiene,"—a sentence which possibly lets out a little more of one side of the truth than "Ouida" intended. No one would grieve more than we should over the wiping-out of streets along which the feet of Dante had trod, and which are connected with a past of such exceptional interest; but it is, unfortunately, quite impossible to accept the statement of the case on the bare assertion of "Ouida," who is a witness quite incapable of seeing both sides of such a question. It may be, as she asserts, that sanitary improvement is a mere pretext; but we cannot take her word for that, sanitation being a subject about which "Ouida," we suspect, knows and cares equally little. We have set on foot an inquiry on the spot as to the real state of the case on the practical side. We hope, in the meantime, that "Ouida's" statements as to the sweeping character of the measures contemplated by the Florentine authorities are exaggerated. If it be true that a large portion of the ancient part of the city is in such a state that sanitary reasons render its rebuilding a matter of serious importance, there is no doubt that, unless Florence is to be abandoned as a modern city, and left as a mere show, the sanitary considerations ought to take the precedence. As we said in the case of Venice, deeply as we may regret the loss of ancient appearance and ancient associations, we have no right to demand that a city which has a modern life of its own to provide for should forego practical improvements in order to preserve the city as a spectacle to visitors from other countries. One argument adduced by "Ouida" is that the insanitariness is in the present inhabitants, and not in the buildings. If so, there is no need to destroy the buildings; turn out the dirty inhabitants, and put them under more rigidly-enforced sanitary regulations. By all means let no destruction of ancient buildings be undertaken rashly and without real practical necessity. But let those who would take a part in preventing it first ascertain the real facts on both sides of the question, and not act merely in pursuance of the writings of a somewhat hysterical novelist.

**T**HE Vicar of Fairford has appealed to the public through the *Times* for subscriptions to keep the famous ancient windows in his church in repair. According to the report of Mr. Westlake, who has been called in to examine the windows, unless they are re-





The Triangular Bridge  
Croyland

leaded, or a majority of them, a great deal of the glass will be lost, as the old lead is giving way and bulging. This is a serious matter, and ought to be attended to immediately. From the tone of the Vicar's letter, as well as from the fact that so sound and competent an adviser as Mr. Westlake has been consulted, subscribers to this object may feel quite assured, we should imagine, that their money would not be misused in any pretence of "restoring" missing or damaged portions, and thus impairing the authenticity of the glass. Mr. Westlake, we are convinced, will take care of that; and the preservation of the windows against further decay and dilapidation ought not to be delayed. But we recollect commenting on a similar appeal from the Rev. A. S. Loxley, the then vicar of Fairford, more than a year ago. It would be well, therefore, if the present vicar were to give some account of the amount which was obtained by his predecessor, and the way in which it was spent. Mr. Carbonell makes no mention of the previous appeal or the previous survey, and while we fully admit the claims which the Fairford windows have on the country at large, it must also be borne in mind that this local guardian is also, in effect, a trustee for those who have subscribed already, or may hereafter give something towards the preservation of these windows.

THE small volume of "Rambling Sketches In and Around Peterborough," by Mr. Arnold B. Mitchell, contains six quarto pages of small sketches, reproduced from pencil drawings, which, in style and artistic feeling, are little gems of their kind, indicating accurate perception of architectural detail, with a charming touch and style. They look slight, but they have been carefully studied. Among the best are a corner of the Lady Chapel, Peterborough (Plate I.); the old Rectory at Tickencote (Plate V.), very slight, but giving the poetry of the simple old house; and odds and ends from Peterborough, on Plate II., are very interesting. When we said "accurate perception of architectural detail" we used the word advisedly, because in some of the sketches, though there is accurate perception of the detail, there is not quite enough indication of it, even for a sketch; for instance, the sketch of the west front of Peterborough on Plate I. would hardly convey to anyone who did not know it the fact that the piers are vertically lined out by a series of shafts; they are left merely white space, for the sake of a telling balance of light and shadow. This kind of thing has been brought into fashion by the new American school of draughtsmen and book illustrators; it is brilliant and telling, but it may be doubted whether it is quite the right way to make an architectural sketch brilliant, to leave out a great deal that is there—leave it with hardly even an indication. However, the little

book is a very charming one, and will please all lovers of old architecture. The accompanying cut is reproduced from the original sketch for one of the bits in the book, the Triangular Bridge at Croyland, but it is reproduced here a good deal larger than the scale chosen in the book, and perhaps comes out better on the small scale.

THE *Quarterly Statement* of the Palestine Exploration Fund mentions, among its matters of archaeological interest, one of modern interest, viz., the progress that is being made in improving the roads in Palestine. The existing road from Jaffa to Jerusalem has been much improved, and the work is still in progress. In one place the road is to be widened, by breaking away the rocks, and building parapet walls on the outer edge where necessary. "In the Plain country several improvements have been made, but unhappily the steep ascent at Kubab is still remaining and not improved. One of the decaying watch-towers was removed and put nearer the road." The road from Jerusalem to Hebron, we read, is finished, "so that carriages are now going there." This sounds practical, but prosaic. Perhaps there might be room in Palestine for a "Society for the Protection of Ancient Roads."

DR. TREU'S paper on the marbles of the west pediment of the Temple of Zeus, at Olympia, will naturally excite great interest in a wide circle of readers. It has so far been almost universally held that, dispute as we may over the arrangement of the east pediment, the west was secure. Dr. Treu's own original disposition of the figures, or rather groups, was at once accepted by the archaeological world, and was forthwith reproduced in dozens of books and cast museums. Dr. Treu himself now stands forward as champion of certain sweeping changes, and we cannot but admire his straightforward courage in avowing his own time-honoured mistake. The new arrangement does not fit in so well as the old one with the words of Pausanias (v. 10, 8), and we are not surprised to hear that Dr. Treu, and many another archaeologist, would still have hesitated but for the final impulse given by a conversation with Dr. Dörpfeld (wenn nicht ein Gespräch mit Dörpfeld hierzu den letzten Anstoss gegeben hätte). Dr. Dörpfeld's genius is as strongly solvent for error as it is constructive for truth; nor with a mind so swift does conviction tarry long. If Pausanias does not accord with facts, Pausanias is promptly, to use Dr. Dörpfeld's own lively image, "cashiered" (cassirt). This master among architects is no specialist in sculpture, but his *parerga* would make the name of a lesser man. To be understood, the argument, a long and complex one, must be read in connexion with the accompanying plates ("Jahrbuch des Instituts," 1888, Taf. 5, 6 with text), and could not well be even summarised without

them. In addition to the main argument, Dr. Treu gives some very important remarks on the cause of the difference of material (parian and pentelic marble) in the statues of the west pediment. We may hope that the authorities of the South Kensington Museum will re-arrange these reduced casts of the sculptures, and, if they do not like to take so marked a step, will supplement the existing arrangement by a second one.

THE same number of the "Jahrbuch" contains a paper by Dr. Michaelis on the disputed relief of the suppliant Demosthenes (Demosthenes Epibomios), which now stands in the library of Trinity College, Dublin. Lovers of Demosthenes and archaeologists alike have for the most part been haunted with an uncomfortable feeling that the relief as figured and described in old books was "too good to be true." But as the original was missing, no satisfactory decision could be arrived at. When it was rediscovered and photographed there was much to strengthen the impression. Conviction as to style is difficult to convey, but any one can be made to understand that *Demosthenes* is a suspicious form, and only, Dr. Michaelis assures us, to be paralleled by the undoubtedly false *Kleisthenes* of the Medicean Venus inscription. That the whole character of the letters is "uneasy" (ängstlich), wants the specialist's eye to appreciate; that the arrangement of the inscription is contrary to antique custom, is easily seen. The college authorities may confidently detract their relief from its place of honour, or, better still, add a word of caution, and keep it aloft as a warning.

EIGHT frescoes have recently been fixed upon the walls of the National Gallery at Berlin, surrounded by a border of architectural character from the designs of Herr H. Gärtner. The history of these frescoes is interesting from a technical point of view. They were originally painted on the walls of the Casa Bartholdy by the German painters Cornelius, Veit, Overbeck, and Schadow; they were then acquired by the Prussian Government for 48,500 lire (about 2,000*l.*), and a further sum of 13,000 lire was spent in carefully removing them from the walls and transporting them to their new and permanent home.

THE deaths of the Emperors William and Frederick have produced, and are still producing, a large crop of monuments for cities, great and small, throughout the German Empire. Among the artists whose powers have been called out with this object, none seems in greater request than Reinhold Begas, who was already well known before, but who now is inundated with orders of all sorts and sizes. The most important work at present in hand, the general design for which is now complete, is the sarcophagus of the Emperor Frederick at Potsdam; upon the monument, with Prussian eagles at the four corners, lies the full-size figure of the deceased, clad in the handsome uniform of the Cuirassiers of the Guard, helmet in arm, the laurel-wreath of Worth on the breast, the figure reposing upon an ermine-lined military cloak, which partly covers the feet. The sides of the sarcophagus have scenes from his life and sufferings in high relief.

THE Town Council of Edinburgh appear to have a very inadequate idea of the labour, expense, and ability required in the production of a worthy example of the sculptor's art. They have offered premiums of 20*l.*, 15*l.*, 10*l.*, and 5*l.*, for the second, third, fourth, and fifth designs in merit of a monumental group, to contain two statues in the best monumental bronze of not less than 14 ft. high, on a suitable basement, which, if in the form of a pedestal, must be of Aberdeen granite 15 ft. high; the cost of the completed work not to exceed 2,700*l.* This movement had its origin in a bequest by Captain Hugh Reid of 1,000*l.* to the city, which was to accumulate for twenty-five years, and the proceeds applied towards the erection of a monument to Bruce and Wallace—"say an ornamental



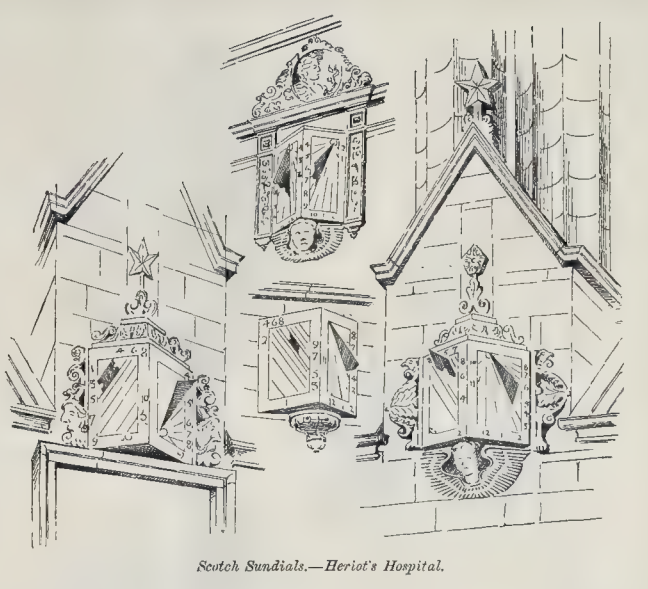
piece of water in the North Loch, with a fountain in the centre, and colossal statues of bronze of each hero as if in conference." The site selected for the proposed monument is the terrace of Prince's-street Gardens, to the west of the Scott monument. This is the second attempt made by the Edinburgh Municipal Authorities to get a design for the Bruce and Wallace monument at a cheap rate, and it is, as was to be expected, no more successful than the first. Only three sculptors have responded to the call, and none of the designs which have been exhibited are at all what should be. Double the sum proposed to be expended would not be too much for a work of the nature required, and the position it is to occupy. If the thing is to be done let it be done thoroughly; the monument will have a peculiar significance, and if of a paltry description will be apt to be sneered at by those who make light of Scottish nationality, which is at present being brought to the fore. Let Professor Blackie look to it.

THE Church of SS. Anne and Agnes, with St. John Zachary, within Aldersgate, has just been extensively repaired, at a cost of some 2,000l., under the superintendence of Mr. Ewan Christian. The alterations comprise the laying of a new parquet floor, the removal of the gallery, and the repair, by Messrs. Lewis & Co., Brixton, of the organ, its case being retained. This church, originally dedicated to the mother of the Virgin, and long known as St. Anne-in-the-Willows, is mentioned as early as the year 1400; it was burnt accidentally in 1548, restored in 1624, and after the Fire was rebuilt of red brick, in 1680, by Wren, at an expense of 2,448l. The interior was repaired and renovated about fifty years ago: its dimensions, as given by the late George Godwin in his "Churches of London," are "53 ft. every way, and 35 ft. high. The height of the tower and turret is 34 ft." With this parish was united after the Fire that of St. John Zachary in Maiden, John Engine, Lane, whereof the church, cited in Diceto's survey, was founded by Sir Nicholas Twyford. In the "New Remarks of London," as collected by the Company of Parish Clerks, 1732, it is stated that Twyford's "Corps was lately discovered immured in a cavity of the ruin'd Wall on the south side of the altar." The dedication was originally to St. John the Baptist. About 1180 the Dean and Chapter of St. Paul's granted to one Zachary an annual rate - charge, which they held upon the parish. Sir Nicholas, Lord Mayor 1388-9, who died in 1390, was, together with Dame Margery, his wife, buried in St. John's. Stow mentions certain members of the Goldsmiths' Company who here found interment, including John Sutton (1450) who, *teste* Weever, was slain on London Bridge by Jack Cade's Kentish men; John Francis (1405); Drago Barantine (1415); Lord Mayor in 1398-9; and the loyal Sir James Pemberton (1613), Lord Mayor 1611-2, who, on the day of King James I.'s proclamation, entertained forty earls and barons in his own house, and endowed a free school at Ecclestone, Lancashire. This church's site was added to the parish burial-ground.

A SMALL etching of Lambeth Palace\* from the river, by Mr. Edgar W. Wilson, is a pleasing example of what may be called the topographical class of etching, not destitute of artistic effect, but in which accuracy of representation has been the main object. The old buildings are very well represented, but the cross-hatched shading on the nearest portion of the palace does not convey very well the texture of brickwork, nor is it a method of treatment quite in keeping with the special qualities of etching. By the same artist is a pretty little etching also of the Bunyan Mission House, at Lambeth.

ARCHITECTURE for January 19th published the ground-floor plan, and the plan on the railway level, of the great new

\* Published by H. E. Pearce, Kennington Cross.



Scotch Sundials.—Heriot's Hospital.

railway terminus of St. Lazare, and the attendant hotel, which is posted as an island in front of the entrance to the station, to which reference has often been made in our "Letter from Paris."

THE first annual meeting of the Yorkshire Association of Sanitary Inspectors took place at Leeds on the 12th inst. The President, Mr. T. Pridgin Teale, F.R.S., said, in his address, that a case of house drainage in Leeds had recently come to his knowledge in which the drain-pipes had been laid under the basement-floor of a new building without any jointing material, the consequence being leakage at every joint. This was discovered about twelve months after the building was first occupied, when illness led to an examination of the drainage. The Buildings Committee of the Corporation had approved of the proposed system of drainage, but it was found on examination that various details in the plans had never been carried out. There is a Sanitary Committee of the Corporation also, but they can take no action until after such a case has occurred, or until it can be declared that a nuisance exists. In this case the Sanitary Committee ordered alterations to be made, but it is an unsatisfactory state of things when work of this kind is done under a divided responsibility.

WE have received the preliminary prospectus of an institution called "The Builders' Technical Aid Institute," the main objects of which are thus stated:—

"In view of the many technical difficulties that surround the trade of the builder, it has been decided by a few professional gentlemen to organise and develop an Institute whereby, with a system of co-operation, builders may gain many advantages from interchange of opinion and unity of interest. The objects, therefore, are to found an Institute for the technical assistance of builders, by which they may be able to obtain not only practical advice, but also efficient assistance in every branch of work appertaining to a builder's office. They will thus enjoy the benefits conferred by a judicious and practical application of the principle of co-operation."

This appears to be a scheme to take paternal charge of the builder who does not know his business, and see him through with it. This is very kind, and will no doubt be appreciated by the incompetent builder; but we should imagine the best of the building trade would hardly place themselves under the tutelary care of the proposed Institute. The most delightful part of the prospectus is the following:—

"It occasionally happens that builders are at

times asked by clients, where no architect is employed, to make plans of proposed alterations, or even new buildings, and at such time a clear and concise drawing materially assists to bring the matter to a successful issue. It will only be necessary to send full particulars to the Institute, or an assistant would attend on the builder to take the necessary particulars, and pencil sketches submitted for approval if desired. Terms will be found to be very reasonable, according to circumstances."

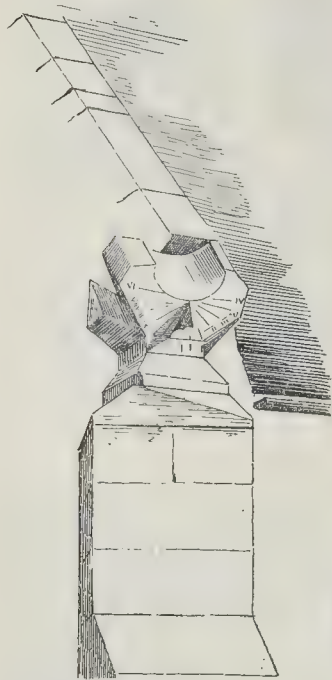
This appears to be an arrangement for supplying the jerry-builders with a little knowledge at a cheap rate, and assisting them in their chronic fight against their natural enemy, the architect. Altogether it is one of the most singular undertakings we have heard of for some time, and we are quite at a loss to understand the object in setting it on foot, or who it is who is to benefit by it.

#### ANCIENT SUNDIALS OF SCOTLAND.

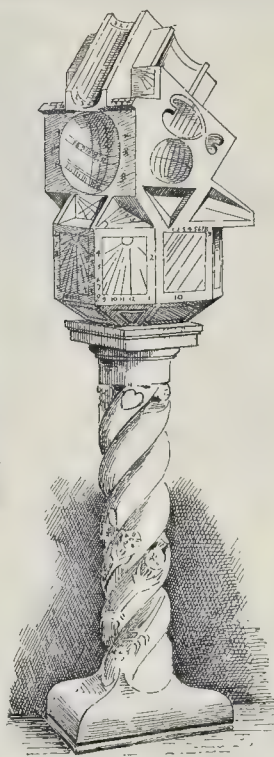
A PAPER on the "Sundials of Scotland," illustrated by drawings of about 200 examples, was read before the Society of Antiquaries of Scotland on the 14th, by Mr. Thomas Ross, architect, Edinburgh. The sundials of Scotland, the author said, were divisible into two classes,—those attached to buildings and those standing alone. Of the former kind, examples were to be found in almost every village, and in some localities they were very numerous, and certain buildings, such as Heriot's Hospital, where there are eleven dials, of some of which illustrations are subjoined, Philipstown House, Hatton House, and Innes House, derived a peculiar charm from the various dials with which they are adorned. Particular attention was drawn to two remarkable dials,—one on the church of Cockburnspath (see illustration), and the other on the neighbouring church of Oldhamstocks,—as being among the oldest examples in Scotland, and dating probably from early in the sixteenth century, and presenting features in their design not to be found on others of their class.

It was pointed out that the empty panels on the south-west corner of John Knox's house, above which appears a sculptured figure of Moses, were meant for dials, and not as a representation of the Reformer's pulpit, as is generally supposed.

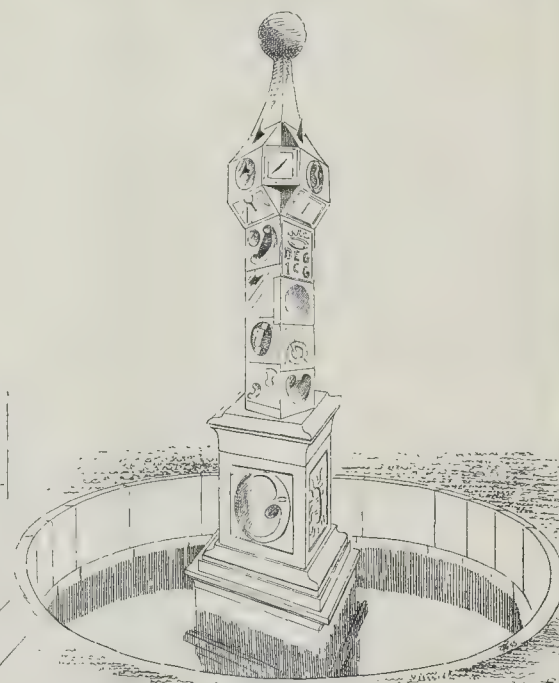
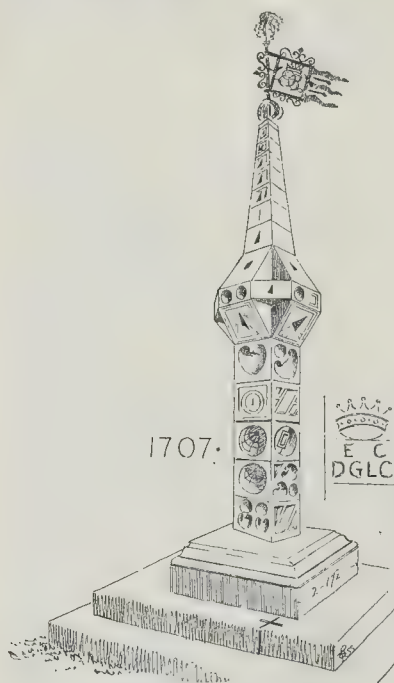
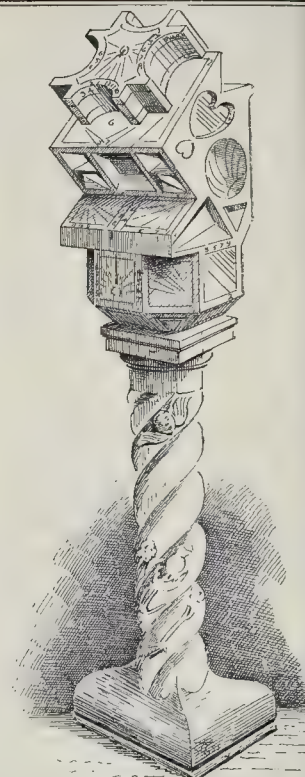
The isolated or unattached dials are also very numerous, and, although varied in design, they were shown to be reducible to four types. 1. The obelisk dial, a lofty, thin, tapering structure, covered with hollow heart-shaped and circular figures in the lower part, each figure being a dial. A bulged capital in the centre frequently contained twenty-four faces, all lined; while, on the upper part, there are numerous reclining dials fitted with metal gnomes. Fine examples of this type are to be



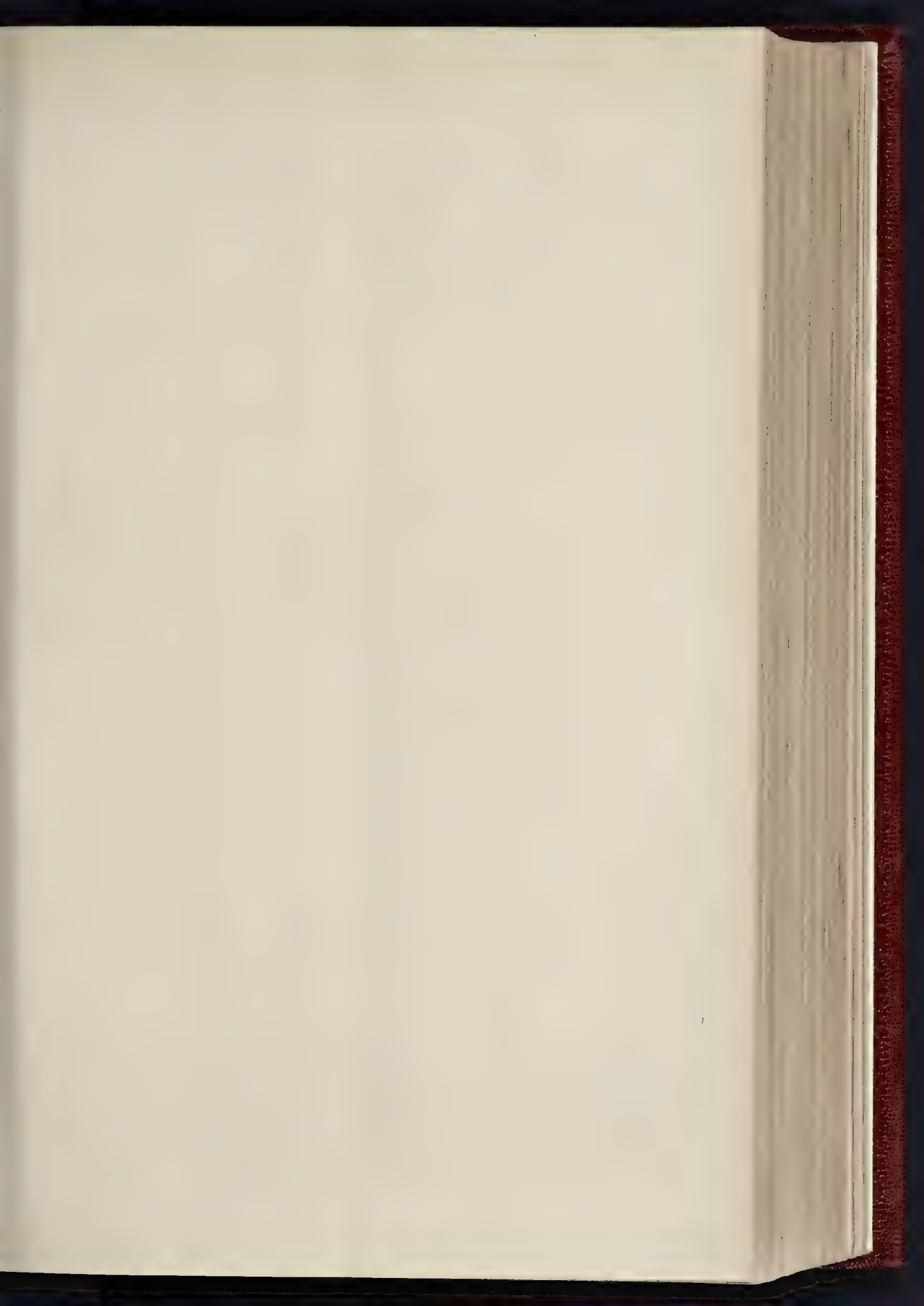
COCKBURNSPATH.



WOODHOUSELEE.

KELBURNE.  
*Sootch Sundials.*

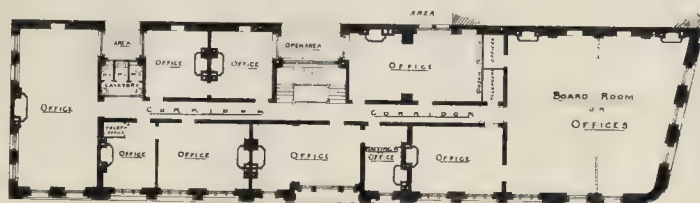






ACCEPTED DESIGN FOR NEW OFF:





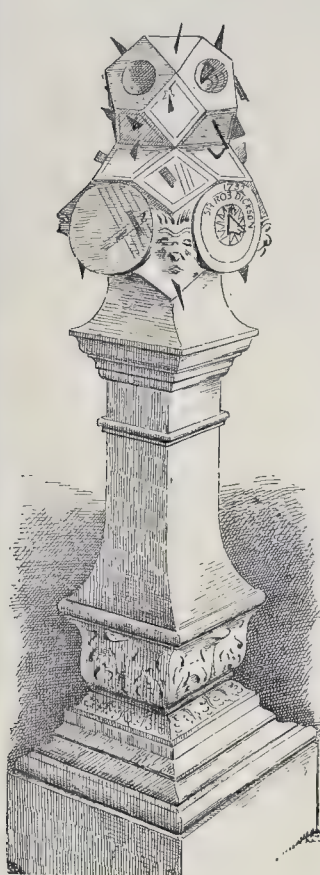
PLAN OF FIRST & SECOND FLOORS

Scale of Feet









CRUMOND.



GLASGOW.

Scotch Sundials.

and at Kelburne, Ayrshire (where there are  
o, of which illustrations are given),  
ochgoilhead, Mount Stewart, Drummond  
ardens, and Invermay (Perthshire), Auchen-  
wie (Stirlingshire), Meggatlund, Barnbougle,  
anton, and Craigiehall (all the neighbour-  
od of Edinburgh), and Tongue (in Suther-  
nd). 2. The lectern dials. These consist of  
a shaft supporting the dial-stone, which is so  
t and shaped that the structure bears a  
neral resemblance to a lectern. This type of  
al is extremely complicated, and fine examples  
e to be seen at Dundas Castle and Pitreavie,  
ar Dunfermline; Ruchlaw, in Stenton Parish;  
d Calder House. There are the remains of one  
Drummore, near Musselburgh; and a very fine  
e stood in the old Zoological Gardens,  
inburgh, which now appears to be lost.  
e most elaborate of this type is at Wood-  
uselee (see illustration); it originally belonged  
the Napiers, and stood at their long-vanished  
ansion of "Wright's Houses," now occupied  
Gillespie's Hospital, Edinburgh. 3. The  
here-angular dials. These consist of a large  
bous head, cut so as to show numerous discs,  
d generally supported on a baluster-shaped  
aft. On each of the many faces there is a dial,  
her hollowed or flat; the hollowed ones are  
ways round, and in only one instance (the one  
be first named) are there any heart-shaped.  
specimens are at Holyrood, Warriston, Crumond  
use (see illustration), Cammo, Woodhall Craig-  
and, Inveresk Lodge and Inveresk House, Bow-  
land, Wayratteshaw, Cadder House, Pitfirrane,  
vermay, Midmar, Mount Melville, and Glamis.  
e one at Mount Melville is very peculiar in  
iving certain features to be found only in the  
st and second types, while the well-known  
amis dial (see illustration) is also an excep-  
tional specimen of the type. 4. Horizontal dials.

These bear a general resemblance to a card-  
table, and are so numerous that it would be  
endless to attempt their enumeration. It may  
be pointed out, however, that there are two  
classes of this type. 1st. The class with the  
centre baluster-shaped support, on the top of  
which is placed the wide table, either round,  
octagonal, or square, of which a fine specimen  
from Pinkie was shown. The table has the  
appearance of a Norman capital, in each of the  
side cushion shapes of which there is a dial,  
besides the large horizontal dial atop. 2nd. The  
class where the baluster simply swells out at  
the top, so as to contain the dial. Of this  
class a characteristic specimen from Niddrie  
Marischall was illustrated.  
It was shown that the erection of these dials  
went on simultaneously, that the same man,  
John Mylne, erected the obelisk at Drummond-  
gardens and the sphere angular dial at Holyrood,  
and that Archibald Handsyde of Musselburgh  
made the very complicated dial at Crumond and  
the two simple dials in Inveresk Churchyard.  
Selecting from about fifty dated examples, it  
was found that the dial-making period extended  
from 1623 onwards for about 150 years,—not  
that it can be said to have ever died out, but  
with the exception of a remarkable dial at  
Bredisholm, near Glasgow, erected in 1840, few  
modern specimens are worthy to be compared  
with the ancient examples. Dials were, doubt-  
less, made in Scotland as early as the beginning  
of the sixteenth century,—as at Oldhamstocks,  
Cockburnspath, and King's College,—but few  
specimens can be identified as belonging to  
that period, and but few references are to be  
found in contemporary literature,—Gavin  
Hamilton's comparison of Chaucer to a dial  
"in the Prologue to the 1st Bouke," being prob-  
ably one of the earliest.

THE GROSVENOR GALLERY EXHIBITION.

THE second series of pictures illustrating  
"A century of English art" is, on the whole,  
superior to that of last year, containing a  
greater number of works of special interest,  
though it cannot be said that in this case, any  
more than last year, the collection is so repre-  
sentative as quite to meet the claims of the  
title. The exhibition, it may be remembered,  
was suggested by the collection of "Fifty years  
of English art" at the Manchester Exhibition,  
which included the fifty years from 1837 to  
1887. This takes the century preceding 1837;  
but there are not the opportunities available for  
making a full and representative collection such  
as that of Manchester, especially as so much of  
the ground has been cut away by the successive  
Burlington House loan exhibitions. There is  
enough, however, to make a very interesting  
exhibition, and to give fresh evidence of the  
extraordinary wealth of this country in the  
pictures which are in the hands of private  
owners.  
It is a good while since Wilkie's two exceed-  
ingly representative works, "Blind Man's Buff"  
(46) and the "Penny Wedding" (47), the prop-  
erty of the Queen, have been publicly exhi-  
bited. They occupy a prominent position on  
the walls of the West Gallery, and seem to have  
stood remarkably well. The "Penny Wedding"  
is the superior work, both in character and in  
colour; the humour of the "Blind Man's Buff"  
is somewhat broader, and there is little of  
beauty in the work, though some of the figures  
are admirably studied. The "Penny Wedding"  
is a masterpiece in its way; it is most effectively  
grouped; the rustic grace and courtesy of the  
man in the left just leading out his partner, the  
abandon of the man dancing on the other side,



and the infantile delight of the baby held up in the background, are the most charming incidents among a crowd of figures, each one of which is a study in itself. Between these hangs Reynolds' "Countess of Dartmouth" (46), suffering under a modern coat of varnish; not one of the most attractive Reynolds's we know. Other examples by the great portrait-painter are the well-known "Crossing the Brook" (57), and the less well-known half-length of two little boys, "The Masters Gawler" (50), accompanied by a large Newfoundland; a rich and beautiful piece of colour, an ideal painting of children rather than a mere portrait. Another fine Reynolds is the portrait of "Mrs. Morris" (5), like the last-named, the property of Lord Burton. Romney is splendidly represented by the noble portrait of Mrs. Jordan (20), which occupies the centre portion at one end of the room. Also is to be remarked a head of "Lady Hamilton as Miranda" (7). Why "as Miranda" is not evident. Is it Lady Hamilton at all? We do not remember seeing her painted with this rich-coloured, almost red, hair in any other portrait; but it is a remarkable work, much warmer and richer in colour altogether than is usual with Romney. There are several other Romneys, none equal to these two. His portrait of himself (81) is an interesting and expressive work. The "Scottish Reynolds," Raeburn, is represented by a delightful portrait of "Lady Inchiquin" (69), full of character and expression, and painted with great vigour. Reynolds' "Lord Dartmouth" (95), in the East Gallery, is a very fine portrait of a very unattractive personage. Turner is represented by several works, none of them in his highest style. "Pope's Villa" (41) is the most noteworthy, exceedingly fine in the middle distance, but distinctly faulty in the foreground; the sheep are bad, and the men worse, and the foreground generally painted in rather a raw manner for Turner. His "High-street, Oxford" (34), an early work, is admirable for its unity as a picture, for the careful delineation of the buildings, and the exquisitely delicate and aerial sky in the distance; but how modern critics would come down on him for want of "local colour"—for his manner of working up the roadway with the same tone as the stone buildings, to give unity of effect. An exhibition like this would be of more educational value, we may observe, if the pictures as far as possible were dated; some for comparison with the work of their contemporaries; Turner for comparison with himself. There seems to have been no attempt at dating in the catalogue, except giving the date of birth and death of the painter; but that counts for little in Turner's case; the interest of the matter lies in tracing the course of his gradual and extraordinary changes of style.

If the Turners are not of the highest, however, the exhibition has something to set off against this in Constable's well-known and magnificent work, "The Lock" (85), lent by Mr. C. Morrison. Among other Constables a small but splendid work is "Yarmouth Jetty" (37), a sea-piece (unusual for Constable) full of light and freshness, and most beautifully composed. From the note in the catalogue, it appears that this little gem was a thing thrown in to complete a bargain with a certain "Frenchman," who was to pay "250*l.* the pair" for two larger pictures, "I and I give him a small picture of Yarmouth into the bargain." Fortunate Frenchman!

The "Norwich School" is largely represented, more so decidedly than is in proportion to the rest of the exhibition; and Stark's pictures are not, it must be confessed, of high interest. The pictures of Vincent, however, will surprise those (and they are many) who know little of his work; the "Greenwich Hospital" (16), a river view, with the hospital in the distance, is a noble painting of its class, and not unlike a Turner of the early period. Cotman's special genius is very well represented in his remarkably powerful painting, "The Homeward Bound" (35), where a large ship, under canvas, sails up towards the foreground, over a dark sea and with a lurid sky behind her; the look of movement and power on the ship is remarkable; Cotman's large painting, "Scene on the East Coast" (141), is a mere magnified sketch, fine in colour, but utterly bare of detail. If it was regarded at the time as a finished picture, the fact is a curious comment on the change in the view of the responsibilities of landscape-painting since then. There are some fine things by Crome, but his "Sea-piece" (145) is altogether too tremendous. We may mention also a remarkable Gainsborough landscape (98).

Among various works by Morland, many of them good, the best and most characteristic of the painter is "The Carrier's Stable" (53), an interior with two horses, and a man in the foreground sleeping on the straw. Among the various examples of Richard Wilson's sweet but rather feeble landscape (imitative, too, of Claude) that entitled "Sion House" (44) is noticeable as a combination of poetic effect in landscape with topographical accuracy. In this respect it may be compared with the Turner entitled "Pope's Villa." Every one familiar with the Thames would recognise the reach of the river painted by Wilson, and the aspect of Sion House, at once; not many would recognise the scene intended to be shown in "Pope's Villa"; yet Wilson's landscape is not in the least topographical in general aim and sentiment; he treated a real scene so as to get the best out of it, without altering the facts.

Among the figure-pictures is Gainsborough's in some respects beautiful and most interesting work, "The Mall in St. James's Park" (4), which, if we mistake not, was at Burlington House some time ago, and which shows us the Lady Kittys and Lady Bettys of the time walking in groups under the shade of the then large and thickly-foliated trees. Some of the figures are exceedingly graceful, and give the idea of being a faithful representation of the manner and *tournure* of the lady of that time in her every-day walking-out trim. The trees are a drawback, certainly; they are finely massed, but they indicate no genuine tree, only the Gainsborough shorthand for foliage. Another figure-picture which is remarkable,—it should not be passed over,—is a small, highly-finished work called "Children Dancing" (133), painter unknown. It is strange that the name of the painter of such a work should have been dropped, for it is a little gem of its kind, both in character and execution. Stothard's half ideal or allegorical picture of the "Rape of the Lock" (118) is to be seen, once a famous work, which hardly holds its place now; there are some beautiful heads in it, but it is too odd a mixture of the real and unreal, and the "sylphs" are absurdly large and corporeal, quite in contradiction to the description in the poem.

The small gallery, filled with sketches and studies by Constable, forms a part of the exhibition which is of the greatest interest. These hasty sketches exhibit in a remarkable manner Constable's power of seizing on the possibilities of effect in a scene, and rapidly placing them on paper in a broad and massive manner. Among the most remarkable are 249, 254 (a study for the great "Dedham Vale" picture), 263, 274, 287, 294, 301, 302. The Grosvenor Gallery would be worth a visit for this collection of sketches alone.

#### SOME NOTES ON ARCHITECTURAL EDUCATION AND PRACTICE IN FRANCE.\*

THE objects of our Association being (1) to afford facilities for the study of civil architecture, (2) to advance the profession, (3) to serve as a medium of friendly communication between the members and others interested in the progress of the art, I trust that the few notes I have brought together as a result of observation during my stay in France last year as holder of the Godwin Bursary, may not be without interest, as it is considered by some that the method of education is more systematic, and professional practice more uniform, than in England,—that they may tend to make us all appreciate more fully the advantages which we already possess, and, where room exists for improvement, that we may strive by united efforts to secure it.

Thanks to the introductions which I received from his Excellency Lord Lytton, the British Ambassador in Paris, to M. Lockroy, the French Minister of Public Instruction and the Fine Arts, I visited the principal schools, museums, and libraries under the most favourable circumstances, and with those best able to afford me information. I was also present throughout the annual conference of the Central Society of French Architects, held in June, when papers were read and discussed, and new works of interest visited, thus coming in contact with many past and present students of the Ecole des Beaux Arts, both in the sections of Painting and Architecture.

Architectural apprenticeship, as understood

in England, by which a student binds himself to serve an architect for a term of years, usually paying a premium, in return receiving instruction in the art and mystery of his future profession, is hardly known, so that the young aspirant must seek his preliminary training at a special school. French architectural education may be considered as concentrated in Paris, and for this there are weighty reasons. The Ecole des Beaux Arts, in the Rue Bonaparte, founded by Louis XIV., on the advice of his far-seeing minister Colbert, for the special education of painters, sculptors, and architects, has, under many changes of the Constitution, continued its useful mission. It enjoys one great advantage over our admirable schools at the Royal Academy, in that its funds are voted by Parliament, and are, therefore, independent of a revenue proportionate to the popularity of an annual exhibition of the three arts, thus enabling its administrators to foster each branch equally without risk of curtailing its income, and to instruct the public as to their relative importance and sphere.

Instruction at the Ecole is wholly gratuitous,—the best architectural prizes are open to its students as an encouragement to diligence,—architects look to its ateliers for their assistants,—a successful career is one of the best introductions to the numerous municipal and Government appointments,—and, lastly,—the Government diploma (*diplôme d'architecte*) can only be obtained by those who have followed its entire course.

To gain admission to the Ecole, it is necessary to pass an examination involving some preliminary knowledge of architecture, as well as of drawing, modelling, and mathematics, so that more than one school, or atelier, exists in Paris for the purpose of qualifying candidates who, when they first leave the Lycée, or college, would have no chance of success.

The comparative importance attached to the several subjects dealt with in this examination may be learnt from the scale of marks awarded, thus:—

|                                        |          |
|----------------------------------------|----------|
| For architectural composition .....    | 2 marks. |
| Drawing of a head .....                | 2 "      |
| Modelling of a piece of ornament ..... | 2 "      |
| Mathematics .....                      | 5 "      |
| Descriptive Geometry .....             | 5 "      |
| History .....                          | 1 "      |

But, unless the designs, the drawing of the head, and the modelling are approved by the jury, the candidate is not admitted to the remainder of the examination.

When once admitted into the second class, the architectural student is entitled to the privilege of the Ecole until he is thirty years of age. His time is largely spent in the atelier, or studio, where, with perhaps thirty other students, he prepares drawings which are either studies of old buildings or else designs for new, in order to fulfil the conditions of the successive programmes given by the professors. There are three separate ateliers for architects in the Ecole, each of which is directed by an architect professor, appointed by the Administration, and new students are admitted to one or the other by choice in order of their merit as candidates. In addition to these ateliers are what are termed *ateliers-libres*, which are not in the Ecole, but are conducted by architects of distinction, who thus impress their enthusiasm and influence on architects of the coming generation.

Fees are charged for admission to these *ateliers-libres*, and the director, or *patron* as he is called, is enabled thus to maintain a somewhat higher status amongst his pupils than is possible in the Ecole proper. The good fellowship or *camaraderie* which results among the young men thus closely associated together for several years (the "Grand Prix de Rome" being rarely won with less than eight years' hard work at the Ecole), leads all to be jealous of the credit and prestige of their atelier, and affords in after-life a bond of union amongst them which cannot but be satisfactory.

Life in the ateliers has been ably described by Mr. R. Phené Spiers, the respected Master of the Architectural School of the Royal Academy, who was himself a pupil in the atelier of the late Mons. Questel. The course of lectures at the Ecole for the students architects are most comprehensive, and a complete list will be found in the very interesting report of the papers on "Education," read at the Conference of Architects held in London, in May, 1887, and published by Mr. Arthur Catlett the chairman (page 74). These lectures are given by a staff of professors who treat special subjects, but work with a single object

\* A paper by Mr. Francis Hooper, read before the Architectural Association on the 18th inst.



namely, the development of students into well-equipped architects.

It is this systematic instruction in matters appertaining to architecture that I greatly wish to see introduced into our English institutions. We cannot boast of a College of Architecture, but there is more than one institution in which history, geometry, mathematics, chemistry, and the like are fully taught, and could they but be brought to bear directly on architecture and building-construction would afford all the advantages which the French students at the École have long profited by.

Our Royal Academy school, on the other hand, possesses advantages which the Paris students sorely lack, although much of the architectural work there must be done after business hours. For the constant change of visitors, so distinguished in their profession, prevents the students running in the grooves in matters of design and draughtsmanship, which is called "Tradition" in the Paris ateliers, whilst the student profits by their united experience and thought.

Again, Academy students draw information and experience from a multitude of different architects' offices, and can, therefore, afford each other invaluable advice and assistance.

A very real defect of the French system is that little enthusiasm is created amongst students for the study of actual buildings, except from books and photographs, so that too much reliance is placed on the appearance of designs on paper, and too little on the ultimate effect.

As far as I could judge from interviews with young architects and students business experience is difficult to obtain in Paris, as architects when busy mostly obtain temporary assistance, which, though well paid whilst it lasts, does not afford the settled occupation so desirable to young fellows living, as so many of them do, away from home.

Lithography and printing are, again, largely used for reproduction of work, so that there is less need of large staffs, and draughtsmen are constantly glad to return to the ateliers to continue their studies and help their fellow-students. Many men seek employment under architects as "inspectors," or, as we should call them, clerks of works, to thus obtain the practical experience of the conduct of building operations which an academic education lacks. Such an appointment on an important public building is in much demand, as it often proves a stepping-stone to promotion and intercourse with the authorities. It is by such employment the Government gives the helping hand to students returning from their travels after gaining the Prix de Rome. The first appointment is to act as *auditeurs*, or secretaries, to the "General Council for Building," which is a body of experts who advise the Government in all architectural matters, such as the erection of public buildings, new monuments, street improvements, &c., and these students, whose devotion to their art and capacity for work are thus tested by the leading members of the profession, have rarely long to wait for employment, which, though at first very modest, paves the way to better things.

In connexion with the work of the École is a course devoted to Decorative Art, and presided over by M. Galland, a distinguished artist, and pupil of the late M. Labrousse. This course is equally available for students of architecture, painting, and sculpture, and intended more for instruction and practice in composition than in colour, though both are well considered.

It is interesting to note that before entering the École, painters and sculptors alike are required to have some knowledge of architecture, which they must give evidence in examination.

M. Galland was mainly instrumental in founding the Union Centrale des Arts Décoratifs, the object of which is to afford facilities to designers and craftsmen for the historical and æsthetic study of their art. Its agencies consist firstly of a well-ordered library in the place des Vosges, open free from 10 to 5, and from 7 to 10, where some 8,000 choice books and all branches of art may be consulted, and sketches or tracings made, a librarian being attendance to assist inquirers; whilst a small collection of plaster casts is disposed conveniently for drawing.

Its second agency is an admirably-arranged permanent museum of Decorative work in the east wing of the Palais de l'Industrie, in the Champs Elysées. This will remind a Londoner of the South Kensington Museum on a small scale,—for in it are to be found gold and silver

smiths' work, pottery, carving in wood, ivory, stone, carpets, tapestry, embroidery, lace, and silks, photographs and drawings of many fine specimens of decoration as well as designs and cartoons by masters of the art, so that the student may store his mind with good work before venturing to commit his ideas to paper or canvas.

The Galleries of the École des Beaux Arts themselves contain an admirable collection of casts of sculpture,—bronzes, and other architectural details,—whilst its extensive library possesses most of the best works of the day, where, too, are to be found many of the drawings which have gained honours in past competitions, evidencing the high standard of skill attained by the students, and showing also the bent of the instruction given.

A remarkable collection of casts for the study of the history of sculpture in all parts of France occupies the east wing of the Trocadero Palace, M. Courajod being its enthusiastic curator. The specimens, many of which are of great size, are arranged chronologically, and each bears a brief description of place and date, whilst a collection of photographs, both general views and details, add reality to the specimens which of necessity are but fragmentary.

To an antiquarian student the Musée Carnavalet will prove of great interest as illustrative of the history of Paris from the Roman occupation to modern times. In the various State museums and galleries open to the public, such as the Louvre, Luxembourg, Cluny, Gobelins, art students find happy hunting-ground, and others need not be enumerated, as every hand-book contains a list.

Before leaving the question of education, I wish to make a suggestion based upon the double competitions which find favour at the École, and in which a limited time is allowed the students to prepare a sketch-design in the presence of the professor, which serves as a basis for the more elaborated drawings, perhaps involving a month's work to complete.

At the present time the Class of Colour Decoration attached to our Association finds difficulty in obtaining support from the members, due doubtless to the fact that the studies occupy so much time that few can afford the sacrifice. My suggestion is that each subject should, in the first instance, be dealt with as a sketch-design made in the presence of the Visitor, who would after, say, one and a-half hours' work, criticise the sketches made, and those who had time might afterwards re-draw them at leisure. Were this to succeed, the principle might be adopted in other senior classes, the subjects being suited to the short time allotted. There need be no use of straight-edge or compasses, and men might be encouraged to work in charcoal, and so practise committing an idea rapidly to paper. The classes would become more sociable as the members thus worked together, and would partake of the advantages of a sketching-club.

Turning now to architectural practice, the title of architect in France I believe to have a wider application than in England, inasmuch as the *architecte* undertakes many of the duties which we term "surveying"; indeed, there seems to be no title corresponding to our "surveyor," whether in the administration of the Building By-laws, of the police regulations, the inspection of theatres, or the conduct of compensation or other litigious business.

In the preparation of working-drawings, I am not aware that French architects adopt any methods not practised, or, at any rate, unfamiliar in England. I remarked that many of the general plans which I saw, even for buildings of considerable extent, were to a scale of 2 centimètres (m. 0.02) to the mètre, which is about  $\frac{1}{50}$  in. to the foot, and therefore greater than is usually adopted in England. I noticed also, in some instances, many details of design and construction were left to be decided when the building was proceeding, a course tending to a better result architecturally than is the case if every point is settled, perhaps hastily, before the work is begun, but involving considerable labour in the settlement of accounts.

I have already remarked that lithography is much employed in the reproduction of drawings, and its convenience is manifest when it is borne in mind that not only do local authorities require plans to be deposited with them, but that the custom of employing several independent tradesmen, each of whom requires different instructions, involves the preparation of numerous copies.

On one building which I visited, the foreman's

drawings were printed on smooth white calico, the lines and figures standing out clearly, and seeming to resist very well their necessarily rough usage. I need scarcely say that these copies were not coloured.

In public works the architect prepares the working-drawings and details together with the *devis-descriptif*, or specification, which comprises a general description of the work to be executed, as of the materials and workmanship to be employed, and these are transferred to a *verificateur*, or measuring surveyor, who is frequently one of the permanent staff of the department requiring the work.

In private enterprises, the architect not only prepares the plans and specifications, but also the bills of quantity, when such are required by the form of contract adopted.

There are many forms of tendering, as in England, but two only are in general use, viz., (1) the *marché-à-f forfait*, a lump sum, based on the plans and specifications without quantities; and (2) the *marché-au-rabais*, a tender based on bills of quantity, prepared by the architect or at his expense, priced according to a recognised *serie des prix*, or schedule, by the architect himself or the *verificateur*, and consisting of a uniform percentage either above or below the scheduled prices.

In the former method, viz., the *marché-à-f forfait*, for the purpose of obviating any dispute in the pricing of variations, the architect provides in the Conditions of Contract that such prices shall accord with a published schedule, which he cites, and upon which the contractor tenders his percentage, either in excess or as a discount; whilst in the latter, viz., the *marché-au-rabais*, the tender is based upon bills of quantities and not on the drawings, so that there is no difficulty in arriving at a final settlement, the work being measured as it proceeds, and vouchers of weight, &c., transmitted to the architect of all items, the measurement of which would be impracticable on completion.

These systems, which, as far as my knowledge goes, are rarely adopted in England except for the periodical contracts of certain public bodies appear to merit some attention, as they afford the architect a basis for accurately estimating the cost of any alterations to his plans,—and thus of constantly checking the expenditure,—whilst the contractor is saved any risk in respect of insufficient quantities or clerical errors in the pricing of innumerable small or large items, a careful examination of the plans and specification is sufficient to acquaint him with the general character of the work for which he tenders.

For arriving at the final settlement of accounts the "metreux," or estimating clerk of the contractor, meets the "verificateur," or measuring surveyor employed by, or conjointly with, the architect, and if the result is not satisfactory to both parties, it may at least be said that the system is not at fault.

In Paris and in all the chief French provincial towns a schedule of prices is drawn up and revised every three or four years by the municipal architect as the basis of all the municipal contracts, and this schedule is also available for private work, copies being sold for the use of municipal contractors and others.

The method of tendering by separate trades is generally adopted in large undertakings, although involving considerably increased responsibility on the architect, and is strongly advocated on the ground that a contractor with a staff of men belonging to a single trade is more likely to be proficient in that trade than one who undertakes all trades alike. In France, too, with universal suffrage, there is more tendency to encourage the small tradesman than is the case in England. Whether, however, the position of the individual craftsman is in any degree bettered by such a course is still with me an unsettled question.

Technical training for artisans is more extended than in England, and in many places apprenticeship schools are maintained by the municipality in a high degree of efficiency, as in Havre, where boys are instructed in plumbing, forging, and casting iron, carpentry and joinery, as well as drawing and geometry.

It appears to me a subject worthy the consideration of British architects whether in the direction in public instruction they should not exert their influence to give artisans facilities for obtaining such training as would promote their co-operation in building operations.

In town practice French architects have some advantages which their British brethren do not yet enjoy. Land is invariably the property



of the building owner, so that, beyond conformity with the street alignment and the municipal by-laws, they are unfettered as regards the general character of their designs.

The details of the Paris by-laws are embodied in my recent report on "Building Control," addressed to the R.I.B.A., and I will merely state that the height of façades and roofs are limited in proportion to the width of the streets they occupy,—that courtyards and air-shafts must be not less than a given area in proportion to the height of the enclosing walls,—that projections over the footway are restricted, and the minimum height of the several stories is fixed.

The French architect again is not harassed by "Ancient Lights" as they exist in England, the law recognising no right to light derived over the property of another, except from the streets, which are regarded as public property. The height of buildings bordering on the streets is limited in the interests of the community in order to secure ample light and circulation of air for their proper sanitation, and partakes of the nature of a natural "servitude" on the land, any infringement of which will involve prompt pulling down by order of the police, and inevitable loss to the building owner.

For protection against such loss the French Civil Code clearly defines the responsibility of both the architect and contractor in respect of faulty construction, whether due to planning or improper materials and workmanship, and such responsibility extends over a period of ten years.

At the time of the framing of the Code of Laws in 1803, it appears to have been a recognised custom for an architect to make a contract with his client for the execution of certain work for an agreed sum, hence the architect shared in the profits or losses of the enterprise—his responsibility towards his employer was that of the contractor also, and his obligations were so set forth in the "Code." Now, however, architecture has become a distinct profession in France, as in England, and architects no longer share the profits or the risks of the contractor. This change of practice has led to the publication of numerous treatises on the subject, a copy of the latest of which I received from its author, M. Achille Hermant, Vice-President of the Société Centrale des Architectes Françaises, who has investigated the matter with great care, so that a definite course of action may be taken by the "Caisse de Défense Mutuelle," which is an association for defending its members in case of need against miscarriage of justice, and for inquiring into questions of practice affecting the profession at large.

In England, the accuracy and efficiency of plans are in no way warranted, and a client, if he suffers loss, must prove negligence on the part of his architect before he can secure redress. Whilst the French client enjoys the security against losses afforded him by law, architects as a body have no wish to be relieved of the responsibility imposed upon them, as, with increased responsibility, their functions are the more honourable. An agitation is, however, being made against their responsibility for defects beyond their control, and which may be invisible, and due to economies effected by the contractor for his own profit.

Professional services of a purely architectural character are paid by a commission, as in England. On large public works the rate of remuneration varies from 2½ to 3½ per cent.; but it must be borne in mind that the architect is not called upon to deal with the accounts, and on important buildings he is given a resident assistant.

The commission of 5 per cent., which is the usual fee for private work, includes the preparation of estimates, bills of quantity and settlement of accounts, as well as the payment of an *inspecteur* or clerk of works, unless under special circumstances, when an agreement is made on the subject; but in no case does the architect permit the clerk of works to be paid through the contractor.

In every town which possesses Courts of Justice there are *architectes-experts*, who are summoned by the justices to give advice and evidence on matters in dispute about building property, and paid by "vacations," that is, by the time expended, their fees being taxed by the Court in the usual way.

For the erection of almost all important public building competitions are invited, and these sometimes bring to the front the younger men trained in the State schools. In these compe-

titions French architects have a distinct advantage over us, for, in the first place, the conditions are invariably submitted before being issued to the "General Council for Buildings," which is composed of the leading members of the profession, and nominated by the Minister of Public Instruction and of the Fine Arts; and, in the second place, the designs submitted are examined by them in order to insure the justice of the award.

It is somewhat to be regretted that the committee who organise the annual exhibition at the *Salon* will not admit designs submitted in competition. An English visitor cannot but be struck with the size of the architectural exhibits, many being too large to frame, and are, therefore, mounted on strainers. Unlike the Royal Academy Exhibition, photographs of executed work often accompany the geometrical drawings.

Each year one of the most important architectural exhibits consists of the drawings made by the winner of the Prix de Rome, who has just completed his residence at the French Academy.

Last year there were two such exhibits by M. Giraud and M. Duglaine; that of the former consisting of a design for the restoration of the Villa of Hadrian and part of the Palace, and for which he received a gold medal; not only were the architectural details most minutely studied, but also the decoration in colour of the walls, floors, and cupolas. The latter exhibited drawings of the Palace of the Cæsars on the Palatine Hill.

The characteristics of French architectural drawings are more or less familiar to all. The free-hand ornaments and figure drawing, as a rule, are admirably executed; strong projected shadows give life to geometrical elevations, and fanciful surroundings, in the form of freely touched-in landscape, undoubtedly lend a charm to even the most commonplace design.

It is not a little curious that in spite of the wonderful power of French architects as colourists, so little is done in introducing colour on the exterior of buildings or the employment of coloured materials. M. Sédille, who not long ago contributed a paper on the subject of coloured architecture to the R.I.B.A., is making efforts towards reform in this respect, and his façade to the newly-erected "Magasin du Printemps" is a decided step in the right direction, glass mosaic being most happily introduced in broad surfaces.

Visitors to the Universal Exhibition of this year will have an opportunity of studying in the newly-erected iron buildings what can be done in obtaining architectural effect without great expenditure, and we may look forward with much interest to the report of the holder of the Cates Prize.

In conclusion, I would strongly urge English students to utilise to the full the many facilities already possessed for securing architectural education, rather than to lament over advantages enjoyed in a greater degree in other countries, although I feel strongly that we should be familiar with all that is being done abroad, so that we may profit by their successes, and, if possible, avoid their failures.

[A report of the discussion which followed is given in other columns.]

## Illustrations.

### THE OLD HÔTEL DE VILLE, PARIS.

THIS building is the subject of our double-page typo-gravure, and is also the theme of our leading article this week.

### SEVEN SISTERS' ROAD SCHOOLS FOR THE TOTTENHAM SCHOOL BOARD.

THE site of these schools is a very good one, being bounded by streets on each side. The area is about one acre. Accommodation for 1,500 children is provided on three floors: the infants on the ground floor, boys on the first, and the girls on the second floor. There are two entrances to each department, and the classroom system is adopted throughout.

The materials are yellow bricks with red brick dressings, stone being used only for the steps and sills. The roofs are slated. The whole building will be heated by hot water. The estimate is about £12,000, including all boundary walls, fences, caretaker's house, heating, playgrounds, &c.

Mr. Charles Wall, of Chelsea, is the builder, and the architect is Mr. Charles Bell, F.R.I.B.A., whose design, and also that for the Noel Park

Schools, similar in size, were selected in limited competition a year ago. Mr. Gough is the clerk of works.

### COTTAGES AT ECCLESTON, RATON ESTATE.

THE four cottages shown in our illustration were recently erected in the village of Eccleston, at the corner of the road from Chesson, and advantage was taken of the space at command to lay them out on a plan best adapted to combine convenience of arrangement with picturesque grouping.

The entrance doors are approached by a covered way on each side of the central corridor. The cottages in the centre of the block are adapted for the use of widows, the other being larger, and the one on the right has a shop also, with an entrance from the road at side.

The red brick walling, local stone window frames, and brown tiled roofs present a pleasing combination of colour as seen in the natural setting of grass and foliage. Mr. George Parker, of Eccleston, was the builder; Messrs. Douglas & Fordham were the architects employed.

### BAY OF EAST WALK OF CLOISTERS, ST. TROPHIME, ARLES.

THIS is a measured drawing of a portion of the Romanesque work, a description of which accompanied the general view published in the *Builder* of March 31 last year. It is measured and drawn by Mr. A. Needham Wilson.

### NEW OFFICES IN BUTE-STREET, CARDIFF.

FOR MESSRS. CORY BROS. & CO., LIMITED. THIS design was awarded the first prize in the recent competition, after being adjudicated upon by a professional assessor, Mr. J. P. Jones, of Cardiff; the fifty-five designs being first reduced to nine, and afterwards to six, previous to the selection being made. The instructions to the architects were drawn up most minutely, the number of rooms on each floor being specified, and two instances the sizes also were given. Alternative designs were asked for from each competitor showing shops on the ground-floor, this idea has since been abandoned.

A strong-room and three muniment-rooms provided in the basement, with store-rooms, stationery, &c., heating-chamber and cels. The lavatories (as required) are grouped around the open area on one side of the stairs. A staircase and a lift are shown in the accountant's office leading directly to one of the muniment-rooms for conveying the large and heavy ledgers without using the general staircase. Telephone offices are provided, and small storerooms for telegrams, letters, &c., to be sent from floor to another.

Caretakers' apartments are placed on the top floor, consisting of living-room, scullery, three bedrooms, with the usual conveniences. Store-room and tank-room are provided as the remaining floors being devoted to offices arranged on the two plans published with perspective view.

The whole of the floors are to be of fireproof construction, and the staircase of stone.

The height of the rooms on the ground, first floors are, respectively, 14 and 13 ft. in clear; the offices on the second floor 11 ft. 6 in., as instructed. Extra light is obtained at the north end of corridor between ceiling of same and the false ceilings of telephone office on the ground floor and of storerooms above, these being only 9 ft. high, but windows are carried up the full height of the corridor.

The first story of the building is proposed to be faced with dressed Ham Hill stone, the masonry upper portion being of red brickwork, relieved with Monk's Park stone and polished Aberdeen granite columns.

The successful architect, Mr. Edward Bruton, of Cardiff, has been entrusted with carrying out of the work, the cost of which will be about 8,000.

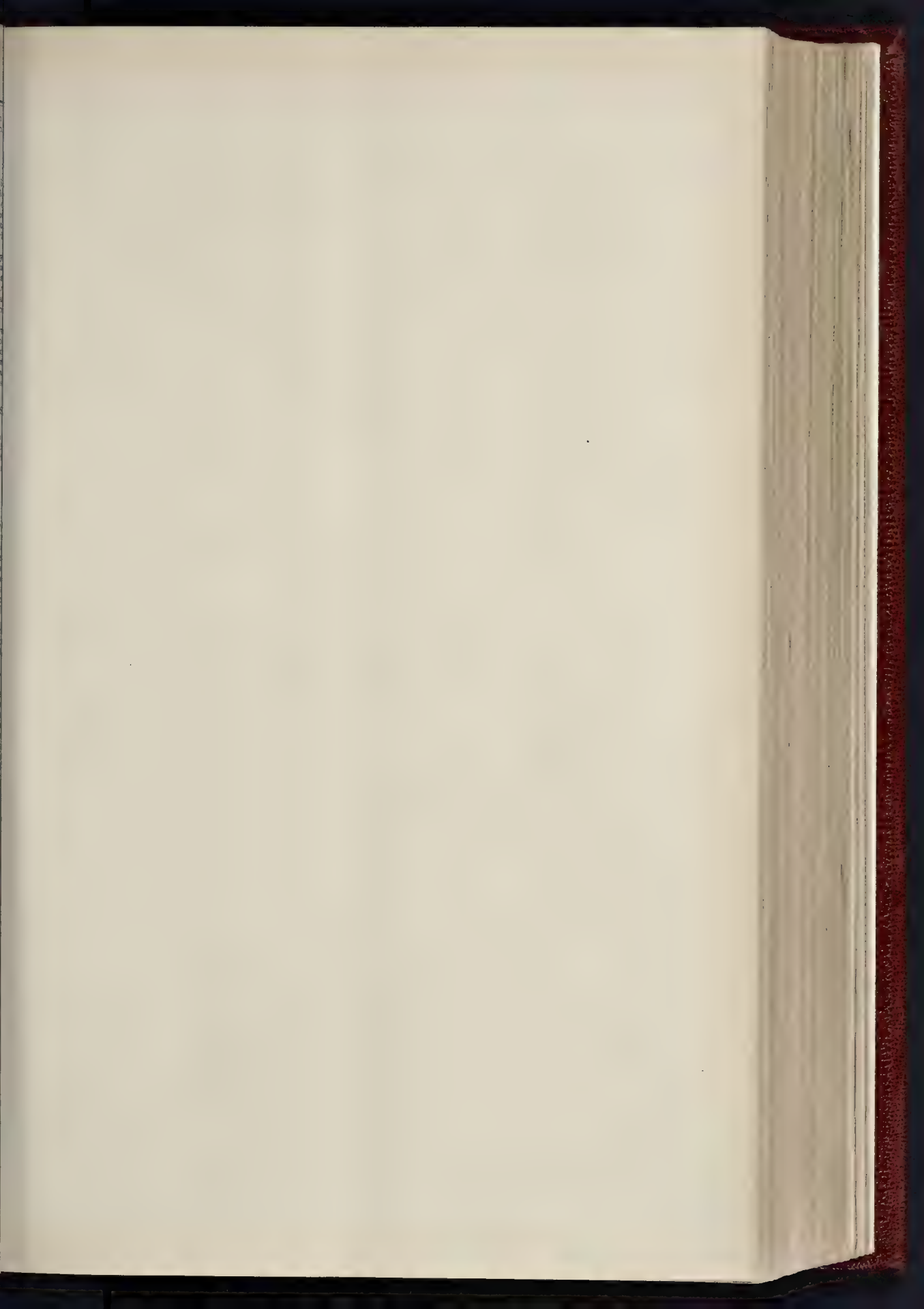
### Greek Mouldings Illustration Fund.

Mr. Penrose, the treasurer for this fund, desires to announce the following subscriptions for last week:—

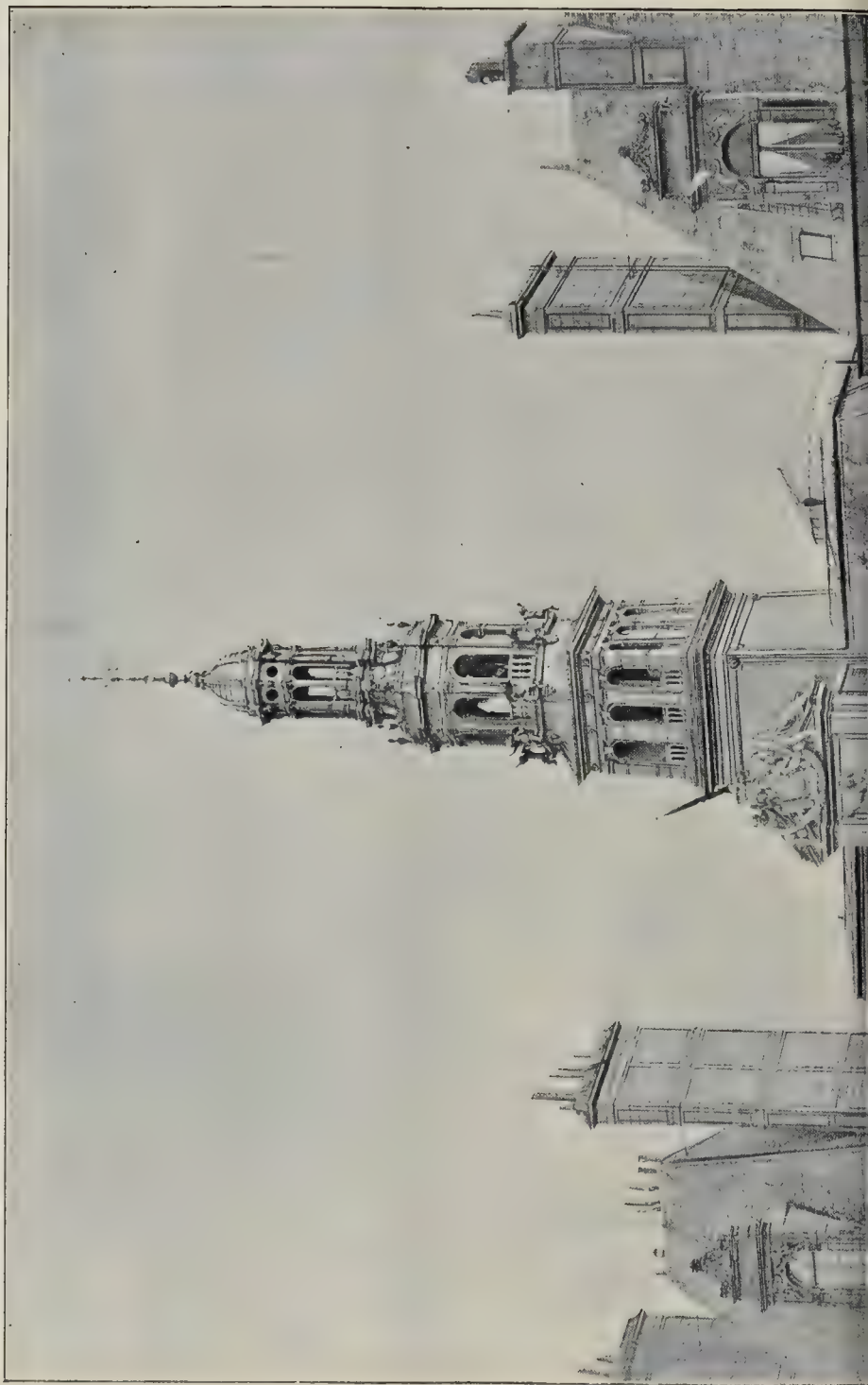
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| Mr. E. R. Robson       | £3 3 0 |
| Mr. Ernest A. Runtz    | 1 1 0  |
| Professor Hayter Lewis | 2 2 0  |

\* See *Builder*, January 5, page 5.





THE BUILDER, JANUARY 26, 1889.





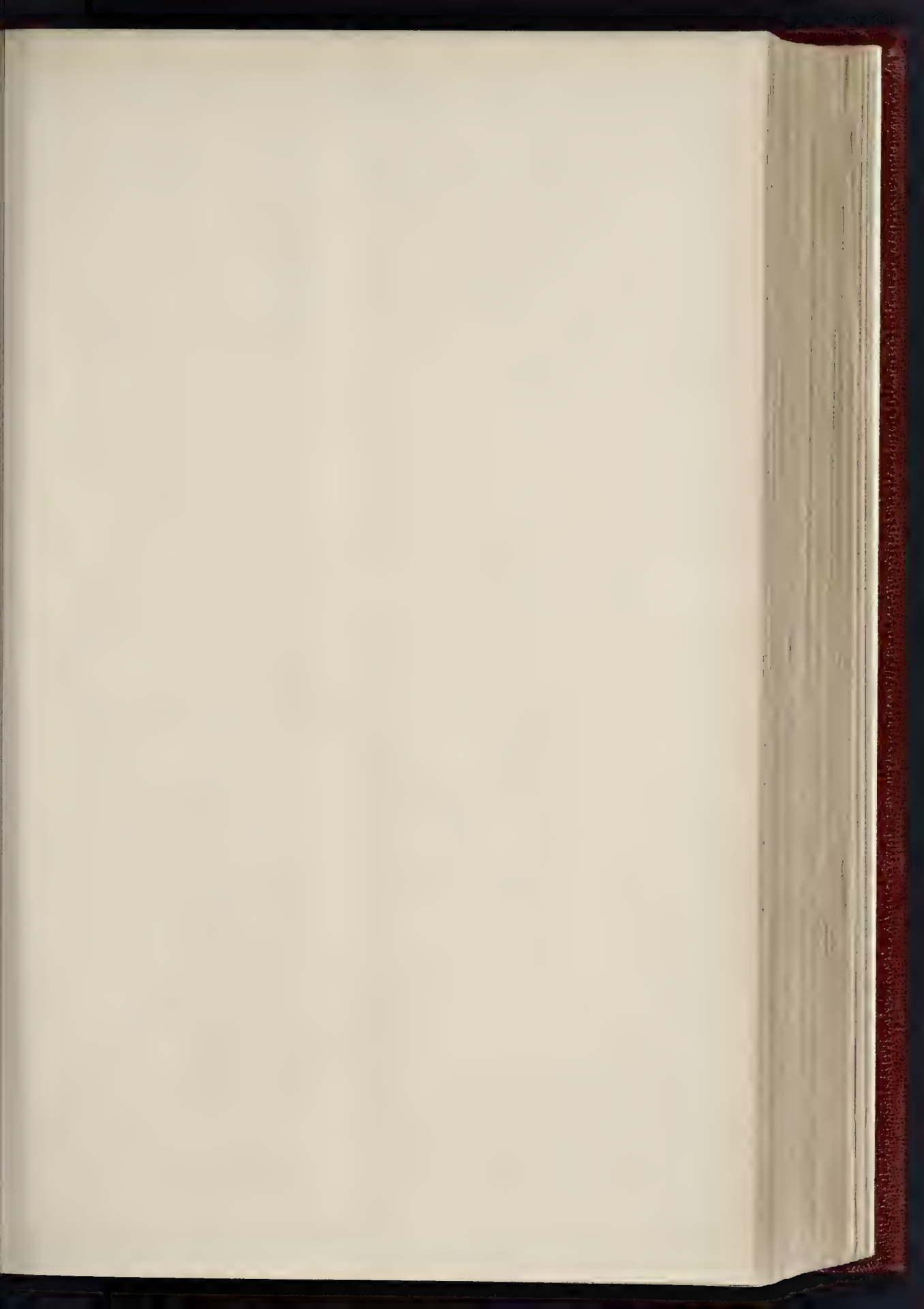


THE OLD HÔTEL DE VILLE, PARIS.

The Phototype Co., 33 Strand, London.

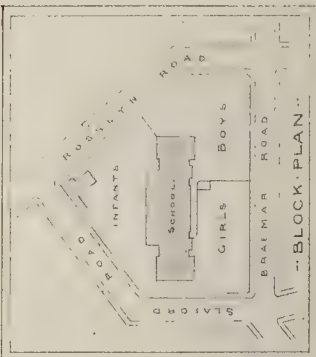




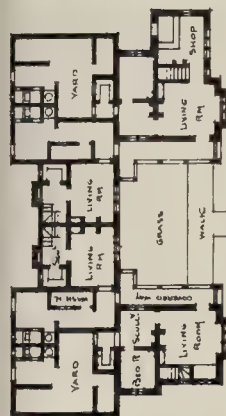


THE BUILDER, JANUARY 20, 1889

TOTTENHAM SCHOOL BOARD  
SEVEN SISTERS ROAD SCHOOL  
CHARLES BELL - ARCHT  
3 SALTERS HALL COURT  
CANNON ST. E.C.







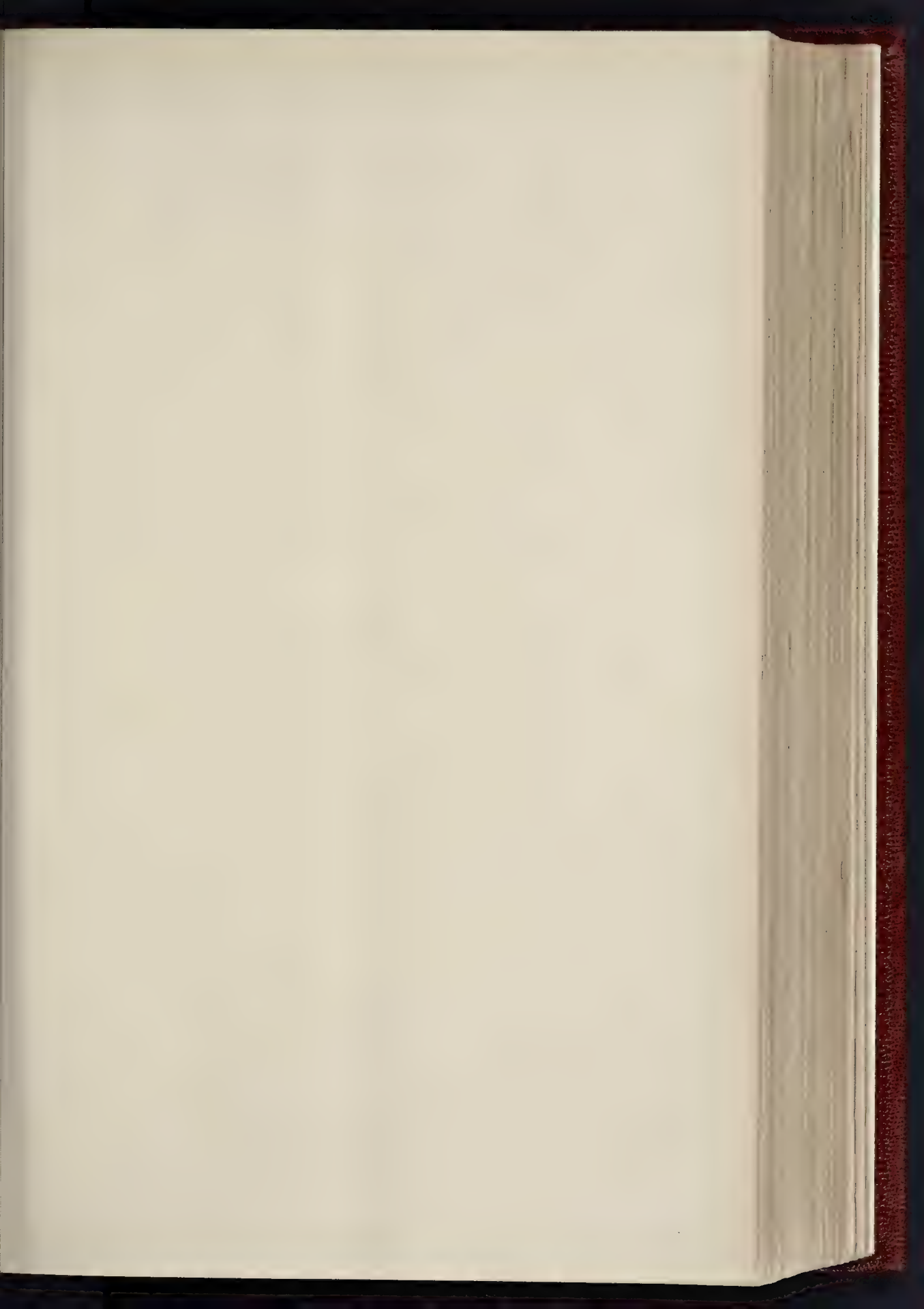
GROUND PLAN.



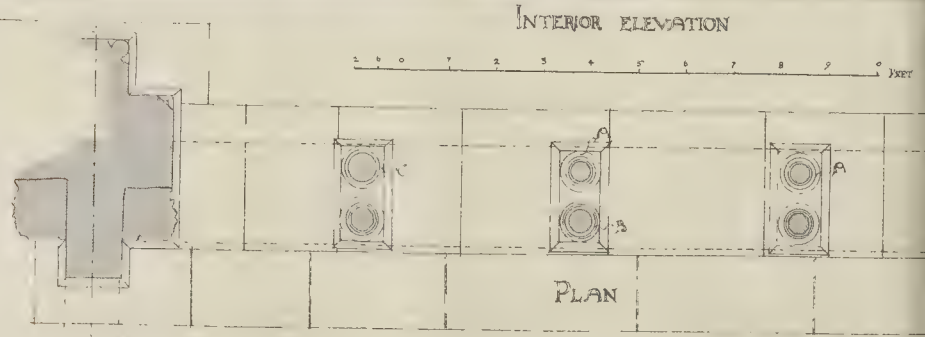
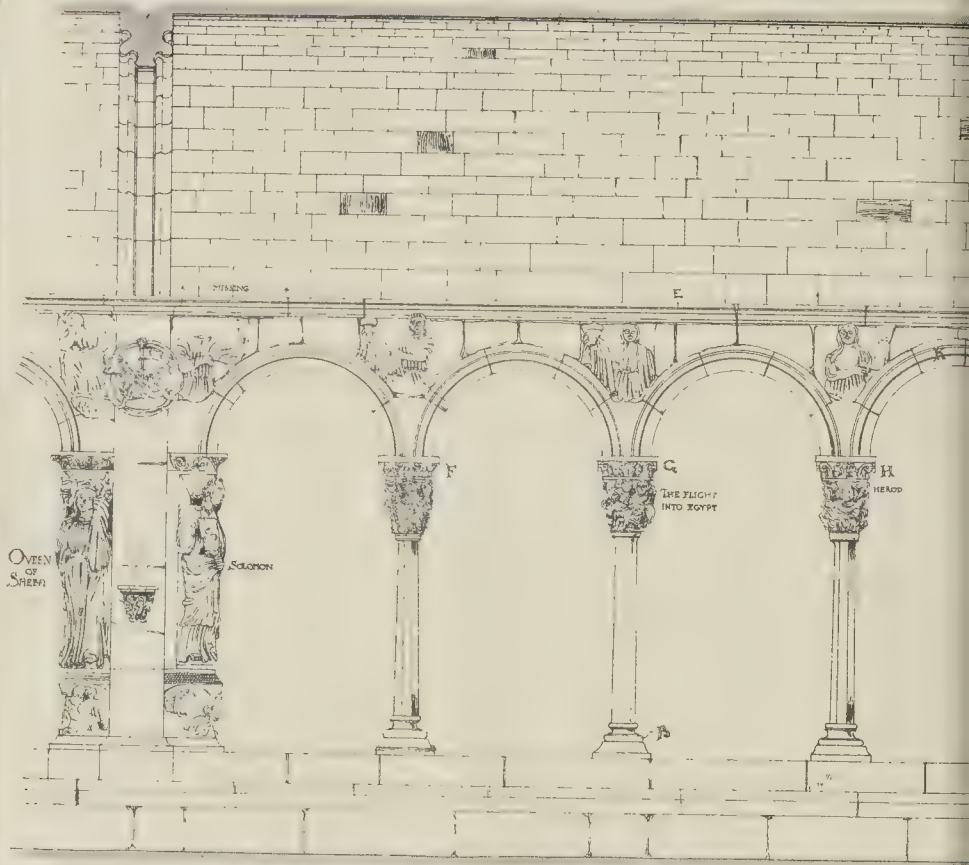
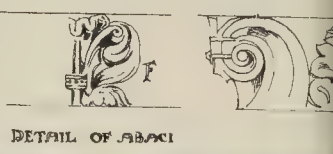
COTTAGES AT ECCLESTON, EATON ESTATE.—MESSRS. DOUGLAS & FORDHAM, ARCHITECTS.



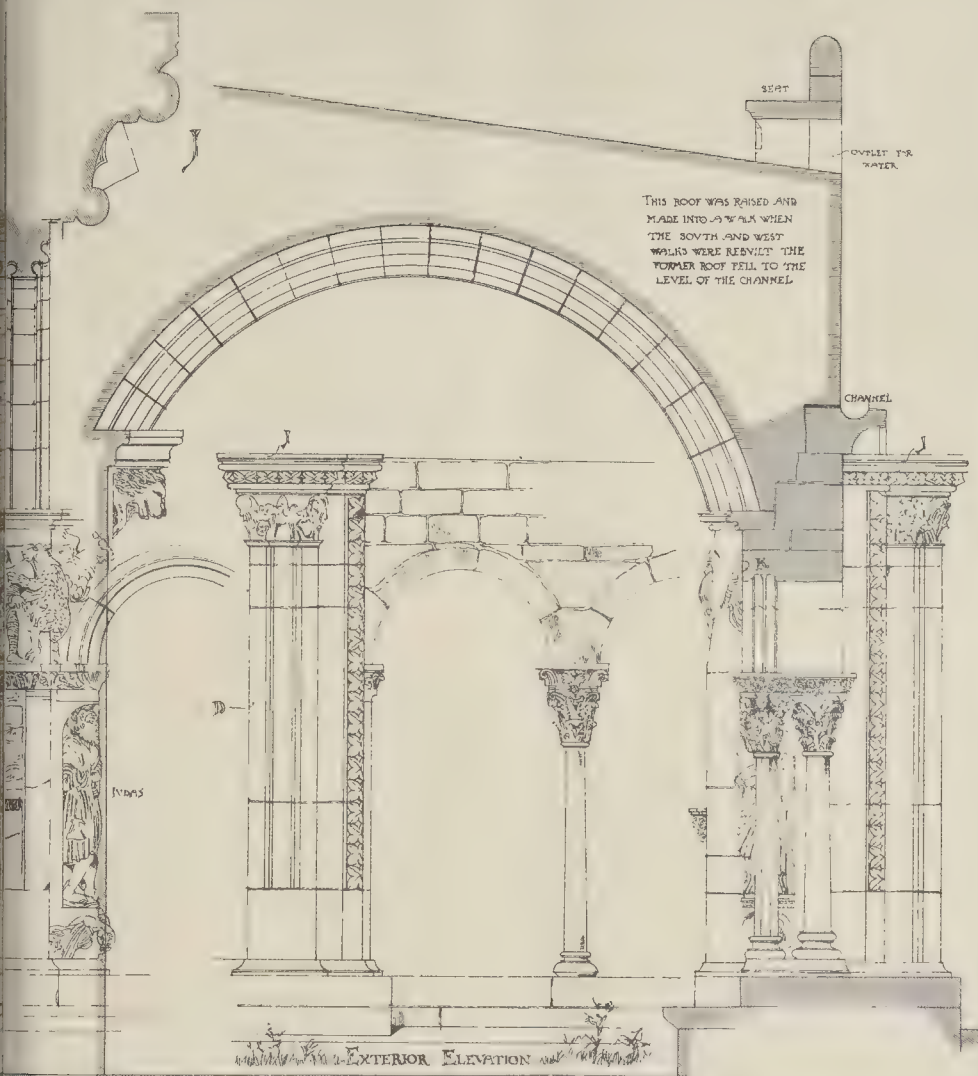




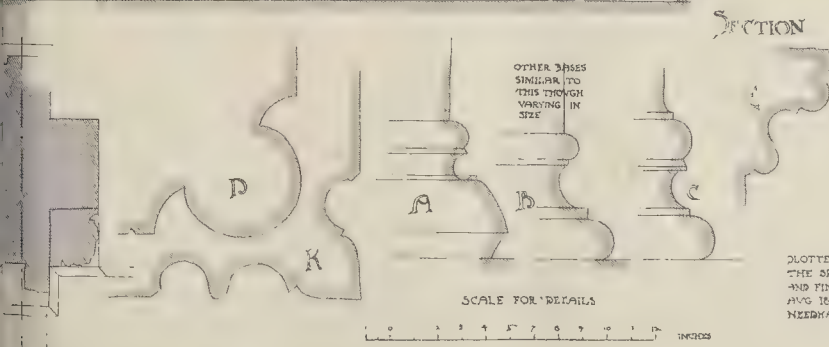
THE CLOISTERS-ST.  
TROPHIME-ARLES-  
ONE BAY OF THE LAST WALK-







THIS ROOF WAS RAISED AND MADE INTO A T.W.A.M. WHEN THE SOUTH AND WEST WALLS WERE REBUILT THE FORMER ROOF FELL TO THE LEVEL OF THE CHANNEL









Competition Design for the Battersea Free Library.—By Mr. Walter F. Lyon, F.R.I.B.A.



#### ST. MARK'S CHURCH, BRISTOL.

ST. MARK'S CHURCH, generally known as the Mayor's Chapel, is on the east side of College Green. It formed the church of the "Bonnamies" founded by the Gaunts in 1231. A considerable portion of the present building is probably of that date, with later windows in the decorated and Perpendicular style inserted. It consists of a nave and chancel (without chancel arch), a south aisle to the nave called the Gaunt chapel, in which is the effigy of the founder, a tower forming a transept, and the Poyntz Chapel, part of this, forming a south chapel to the chancel. There was formerly a north transept, but it has been destroyed, and until within recent years, houses existed against the wall of the church at this point. The windows of the chancel are good examples of Perpendicular work, especially the east window, which has some fine glass. On the north side of the sanctuary are the canopied monuments of Sir Thomas Berkeley and his wife (1361), and alley, Bishop of Llandaff (1516), both of which are fine examples of carving. In the

Poyntz Chapel are some tiles—a few early, and bearing armorial shields—others late. They are given in Lyson's Etchings of Gloucester shire.

This interesting church is now being restored by Mr. Pearson, who is rebuilding the north transept, and forming a cloister outside the north wall communicating with a door at the west end. Several interesting fragments have been found, and traces of a tomb between the nave and Gaunt Chapel. In the north wall of the nave, near the west end, are doors, which perhaps communicated with the Priory buildings. There are some good Decorated windows in the south aisle, on the south side and at the west end, the latter being particularly rich ornamented with ball-flower, and resembling those in the south aisle at Gloucester Cathedral. The sketch here given shows the exterior of the north wall after the demolition of the buildings, and before the restoration was commenced. Only one of the Early English windows remains at all perfect, a second being blocked up, and the remaining two having been cut out about in later times for the insertion of Perpendicular

tracery. An interesting feature is the original corbel table, ornamented with heads of the period. This also exists on the south side, but is difficult to see on account of buildings which adjoin the church on that side. It will be seen by the plan that the west end is not at right angles with the side walls, but following the line of the street. The west window is a late insertion. The upper part of the tower has been restored, including the parapet and pinnacles.

#### COMPETITION DESIGN FOR BATTERSEA FREE LIBRARY.

IN a notice of the designs sent in for this competition, published in the *Builder* for November 10, 1888, we mentioned that by Mr. Walter F. Lyon as perhaps the most picturesque of the series in regard to its exterior treatment. The accompanying illustration shows the principal elevation of this design.

#### ENGINEERING IN A SANATORIUM.

THE amount of machinery that is required for the daily economy of a large first-class hotel would surprise a good many people not accustomed to modern arrangements. What with hydraulic-lifts, electric lighting, steam laundries, and other requirements, the engineering department is often one of considerable importance. Sometimes, as in the case of the Hotel Mont Dore at Bournemouth, the mechanical features are still further increased by the pumping-machinery required for the very complete set of medical baths which form the leading feature of the establishment. As the Mont Dore arrangements have just been remodelled, and the proprietors have taken the best advice that could be got on the various subjects, a brief sketch of the mechanical details may be of interest.

The machinery department here, as in all other large hotels with which we are acquainted, is beneath the ground level. Here it has a floor to itself, under everything else, quite in the bowels of the earth, and a good deal of ingenuity has been expended in the endeavour, which appears quite successful, to keep the vibration and noise of working from affecting the dwelling part of the building above. The first place we enter on descending to the machinery department is the boiler-room. Here there are three boilers, two of the ordinary Cornish type, 10 ft. in length, and 4 ft. 6 in. in diameter. These formed the original source of steam supply, but in consequence of the recent additions, a new Babcock & Wilcox boiler has been put in, and it will afford some idea of the power required in the establishment by saying that there are 750 square feet of heating surface, and 20 square feet of grate surface, yet it is only by hard firing that sufficient steam can be generated. This boiler can be pressed to 120 lbs. The Babcock & Wilcox boiler is of the water-tube variety, and for this reason it is especially suitable for placing under the foundations of an hotel, inasmuch as it is safe from violent explosion, such as an ordinary shell-boiler of any kind is subject to if not properly looked after.

In the boiler-room are two steam salt-water-heaters, consisting of cylindrical vertical vessels 6 ft. high by 3 ft. in diameter, containing copper volute coils. The steam circulates in the coils, the water to be heated passing in the opposite direction. In this way the steam at its hottest meets the water at its hottest, and the highest efficiency practicable is obtained. The water is pumped up from the sea, the hotel having a special main laid down for the purpose. There is a good arrangement for equalising the temperature of the water used for the baths, which has been devised by Mr. Cope, the engineer to the establishment. The water, as it is heated, rises by convection to the top of the building, where a tank is placed for its reception. From this tank it is distributed to the various baths. Fitted to the tank is an expansion pipe, which is so arranged as to be brought into play with variation in the temperature of the water. In this way a constant circulation is kept up by natural means, and hot water flows in lavatories, baths, &c., immediately a tap is turned on, without having to wait, as is usually the case, for the water that has become cold to run out of the pipes; whilst, at the same time, a given temperature is never exceeded. The latter is a most important



point in dealing with invalids, for it is well known that serious consequences have followed in some instances through delicate persons being scalded through the water getting over-heated. There is also the possibility, under ordinary conditions, of getting steam in place of hot water in the pipes; but this, of course, is prevented by the expansion system described. Steam at 40-lbs. pressure is used for heating purpose; but, as the boiler pressure is generally about 100 lbs., a reducing valve has been applied. It would be difficult to give a description of this ingenious device without illustrations, but those who are interested could, doubtless, get particulars from the Babcock & Wilcox Company, who supplied this fitting. Mr. Cope has also arranged that any section or series of pipes can be throttled or closed at one spot near the boiler, so as to have the whole arrangements under one hand. There is a steam drum receiver, and the various cocks for the purpose are actuated from the boiler front. This is a point that also requires some consideration, as various steam pressures are required in certain of the medicinal bath processes; for instance, a low pressure in the inhalation-rooms, with perhaps a higher pressure due to the increased temperature necessary for the Russian baths, or higher still in the case of the Siberian bath.

It is not within our province to describe the arrangements necessary for the various baths. Some of the mechanical details for "pulverizations," "irrigations," and "inhalations" are very cleverly worked out, and we believe it is a pretty well acknowledged fact that the system of baths here is more elaborate than any elsewhere.

The boiler-fend arrangements are worth attention. There is a Worthington pump which can draw from a tank in connexion with the town service, or from a well in the grounds. This well is more than sufficient to supply all the wants of the establishment, there being at all times a plentiful supply of pure water. There is a second Worthington pump used for ordinary work, and this can be applied for feed purposes by making a simple change; there is also an injector. In addition to this, the town pressure of 70 lbs. can be used if the boiler pressure be lowered sufficiently. All pipes are duplicated for alternate service of well or town water. As the machinery is below the level of the sewer a steam pump is provided for lifting condensed water, or boiler washings, &c., to a drain provided for the purpose. There are also other pumps for various purposes in connexion with the swimming-bath, laundry, and domestic necessities.

In the hydraulic pumping-house there are, first, a pair of ordinary vertical inverted engines with 5-in. cylinders and 10-in. stroke. These work a three-throw horizontal pressure pump, worked through spur gearing. These are in connexion with the accumulator, which is loaded to 700 lbs. to the square inch. The automatic stop consists of the ordinary striking gear worked by the accumulator. This installation has been supplemented by a fine set of hydraulic pumping engines of the "Duplex" type, which have been specially designed and manufactured for this work by Messrs. Archibald Smith & Stevens, of Queen's-road, Battersea. There are two horizontal steam cylinders, placed side by side, of 7 in. diameter, the stroke being 6 in. The pumps are of the bucket-and-plunger type, with valve-boxes overhead giving equal delivery on both outward and inward strokes. The automatic stop is quite new, and of very ingenious design,—this being, we believe, the first instance in which Messrs. Archibald Smith & Stevens have applied the arrangement. There is a differential plunger, the small end of which is in connexion with the accumulator, by means of a suitable pipe, so long as the latter is pumped up to its full height. If the accumulator fall, a valve is closed automatically, and, at the same time, the water pressure is released, and this allows the plunger to rise. When the latter operation takes place the plunger is lifted from a loose valve placed in the steam service, and in this way the steam pressure lifts the valve, and steam passes to the pumping-engine. It will be seen, therefore, that when the accumulator is at the top of its travel steam is shut off from the engine, but with the descent of the accumulator steam is admitted.

There are two lifts serving all floors, also supplied by Messrs. Archibald Smith & Stevens. In the principal passenger-lift the car is very handsomely decorated, the panelling being in hard wood, highly polished. It is to be illuminated by electric light. The lift is of the sus-

pending type, and has hydraulic cylinder and safety-gear, as illustrated and described in the *Builder* for March 31 last. The ropes are anchored to the cylinder by a spring-connection, so as to remove all vibration, and, indeed, the cage travels with remarkable steadiness. The goods-lift is of the same general design, except that there is a plain luggage-box in place of a car. Of the lifts for ordinary purposes it is unnecessary to speak.

Passing over various other mechanical details, we will now take the electric-light department. In the engine-house there is a pair of vertical compound engines, with  $7\frac{1}{2}$  in. and  $12\frac{1}{2}$  in. diameter cylinders by 10 in. stroke. The engine is mounted on the same bed-plate as the dynamo, the driving being effected by Raworth's friction gear, in which the dynamo is mounted on trunnions. The arrangement allows of increased speed being obtained on the machine without occupying the space required in belt-driving. It is said to give great satisfaction in practice, there being no slipping, and at the same time little weight on the bearings,—a point of great importance at the high speed at which dynamo-machines have to be worked. The electrical accumulators are placed in a house built for the purpose in the grounds adjoining.

A word may here be said about the arrangements for preventing the noise and vibration of the machinery from passing to the hotel above. Of course it is impossible to get an ordinary double-acting engine to work at the speed necessary for electric light work without jar and with perfect silence. As a matter of fact, the engine in question was far from silent, there being a considerable knock on the crank-pin brasses, a defect which will doubtless disappear after a little running. The dynamo-room and engine-house, it should be explained, are beneath the drawing-room of the hotel, a very undesirable place in which the jar and rattle of machinery should be heard. In order to prevent this, the wall of the engine and dynamo-room have been made double, there being an air-space of about 3 in. left between the walls. In addition to this, 4 ft. of earth has been filled in above the top of the room. The result is that the engine may be run in spite of the knock, without the most sensitive person in the drawing-room being disturbed. It should also be mentioned that Messrs. Smith & Stevens have fitted silencing nozzles, which are, we understand, of a new design, throughout the hydraulic service,—an example that could be followed with advantage in some other hotels. There is nothing more startling to the ordinary individual of nervous temperament than the unexpected ramming of water in pipes.

We had intended to say something about the details of the heating, fire-extinguishing, and electric-bell arrangements, which are in some respects novel, and about the wiring of the house for lighting. Some of the details of the kitchen service and laundry appliances are also worth mention, but we have no space to notice them. With regard to the important question of drainage, there is not much to say. Mont Dore being as happy in this respect as the nation which has no history. It may be mentioned, however, that in remodelling the establishment the present proprietors placed the whole of the sanitary arrangements in the hands of Jennings, of Stangate, which is a pretty good guarantee that everything possible has been done.

The most recent, and, perhaps, the most notable engineering,—or ought we to say architectural?—feature about the place is the new covered lawn-tennis court and winter-garden. This sprung from a happy thought on the part of the management to convert the not very ornate flat space above the baths into something useful and ornamental. The building is of iron and glass, and covers a space of 115 ft. x 100 ft. One would imagine from an inspection of the baths that Mont Dore must be one of the most melancholy places imaginable to stop in; more like a hospital than a hotel. But such is by no means the case, and whatever ills the people may be suffering from they manage to keep pretty much to themselves. The enthusiasts of Bournemouth tell you it is the sand and pine woods that make the invalid in Bournemouth quite a different creature to the invalid anywhere else. However this may be, the ball never ceases to bound in the Mont Dore courts, and it seems to be quite regular to take a parallel course of tennis and Turkish baths. The court is said by experts to be perfectly laid, and the lighting by incandescent lights leaves nothing to be desired; indeed, so good

are the arrangements, that Mr. Ernest Renshaw, the amateur champion, now plays, talks, and dreams tennis at Bournemouth, instead of on the Riviera.

#### ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.

AT a recent meeting of this Association, held at the Westminster Town Hall, Mr. Huxley Alexander, the Chairman of the Council, presiding, Mr. E. Tidman, C.E., read a paper on "The Drainage By-laws as administered under the Metropolitan Local Management Acts." In comparing the powers given by the Acts of 1855 and 1862 to Metropolitan Local Authorities, and by the Public Health Act of 1875 to the Urban Sanitary Authorities, the lecturer arrived at the conclusion that the powers conferred in the two cases were practically identical. The question was then propounded, Why is London more than a quarter of a century behind many of the provincial towns in its administrative dealings with sanitary matters? In order to find the proper answer, the lecturer had procured from the Metropolitan Board of Works, and from as many as possible of the Vestries and district Boards of the metropolis, copies of the by-laws which the Acts give power to make for dealing and regulating the plans and levels of sites for buildings, and for regulating the dimensions, form, and mode of construction, and the keeping, cleansing, and repairing of the pipes, drains, and other means of communicating with sewers, and for the emptying, raking, and cleansing thereof, for the cleansing, closing, and filling-up of cesspools, and privies, and for other works of cleansing, and of removing and disposing of refuse, and for regulating the form of appeal and mode of proceeding thereon. In those supplied from the Metropolitan Board he found not a single clause regulating the construction of house drains; but only clauses relating to the construction of new sewers, and notices, plans, &c., for making sewer connexions; and in those supplied by other local bodies he found an utter lack of uniformity, as well as, in the majority of cases, an entire absence of regulations for the construction and laying of house drains. Among the thirty-nine metropolitan districts, only six had fairly comprehensive by-laws, and in those which required plans drawn to the respective Boards, the scales prescribed varied from one of 8 ft. to the inch, to one of 44 ft. to the inch, no scale at all being prescribed in fifteen of the districts. The details regulating the size of drains, the class and position of fittings, and other necessary works, varying in almost every district, rendered it exceedingly difficult for surveyors, architects, and builders, with a general business in all parts of the metropolis, to comply with them, for what in one district was allowed, in another was not; officials in one district would test the drains with water; others never looked at a single foot of the drain; some liked 2 in., some 4 in. vent-pipes, and others specified none at all. As a consequence, the whole thing was improperly managed. Drains had in principle and workmanship were daily and hourly allowed to be laid, and deadly and defective fittings were put into houses at the sacrifice of the lives of the unfortunate occupants. It was very nearly correct to say, as had been said by one member, that London was fifty years behind the provinces in sanitation, for the great drainage schemes of Sir Robert Rawlinson had been promulgated in 1845, and yet it was true to-day that a greater number of the metropolitan bodies charged with sanitary duties had no regulations complying with the two great elementary requirements of perfect sanitation, which Professor Field gave as:—(1) the immediate and complete removal from the house of all foul and effete matters, directly it is produced; (2) the prevention of any back current of foul air into the house through the pipes or drains which are used for the removal of the foul matters. The conclusion arrived at, therefore, was irresistible; and a heavy indictment, the author said, lies "against the Metropolitan Board of Works for not putting into force the powers conferred upon them by these Acts, an indictment in which the charges made and substantiated before the Royal Commission were trifles, for how many innocent and valuable lives had been sacrificed through their neglect! Their scandalous sanitary defects now allowed to be daily and hourly perpetrated, and perpetuated



by the moribund Board and the local authorities, in the construction of drains and sanitary works within their area cried aloud against them, and none knew better than sanitary inspectors in the metropolis the nature and extent of these defects; yet they were powerless to remedy them. The Vestrymen and District Board members were too much interested in the perpetuation of these crying evils and foul whitened sepulchres, and the inspectors could not work as independently as they should be empowered to do, to compel the removal of fever and death-producing atmospheres from our midst.\* Among other suggestions offered for dealing with new property were the following, most of which had, to the lecturer's certain knowledge, been in force in the provinces for twenty-five years. There should be a correct plan of every house-drain in the metropolis; plans in duplicate, to a uniform scale, should be submitted for all new drains or alterations; the plans should be sealed by the Boards and numbered, one copy being filed, and the other returned to the applicant; certificates, also in duplicate, should be issued by the surveyor when the work had been satisfactorily carried out in strict accordance with the approved plan; using a false certificate, or occupying a building as a residence or workshop, without the possession of such a certificate, should be deemed a penal offence; and with respect to plans not approved, information should not be refused, as had been the custom of the Metropolitan Board of Works, but should be freely furnished to enable the plans to be amended as speedily as possible, in accordance with the wishes of the Board, as was the practice in the provinces.

"I am looking forward with anxiety and interest," said the lecturer, "to the new County of London Council and their proceedings, and trust when they take over the duties of the defunct Metropolitan Board, they will at once take in hand the consideration of the Metropolitan Drainage Regulations, and prepare, from the Local Government Board model, a complete set of by-laws for the metropolis,—altered, of course, to suit the teachings of modern sanitary science. If they do, and also get powers to deal with the old property, which cannot, I am afraid, under the existing laws, be improved except under the Nuisance Removal Classes, which are, I regret, put in force to a very slight extent, the death-rate of London will be reduced to 12 in 1,000, and diphtheria, scarlet fever, and other sewer-generated and preventable diseases will vanish practically from our midst."

With respect to old property, from which chiefly the sewer-gas poisoning and the atmosphere of death was developed, he suggested that more stringent powers for dealing with it should be obtained from Government, and that to obtain this they must all bring their united influence to bear. The old property could, however, be dealt with under Clause 74 of the Metropolis Local Management Act (1855), if it were only acted upon universally. In concluding his paper, Mr. Tidman summarised the recommendations of Professor Robinson, given in his address to the Sanitary Institute, supplementing them with some rules of his own, of which the following are the principal:—

- That all drains passing through houses should be embedded in 6 in. at least of good concrete all round them.
- That all drains should be so laid that there is an efficient air-flush through the whole system.
- That no vent-pipe should be less than 4 in. diameter, and that it should invariably be so arranged that it is carried up perpendicularly, and have no cowl at its outlet or any description to prevent free passage of air.
- That no inlet-vent be allowed at the foot of soil-pipes or on surface-level, but that all inlet vents be fitted with non-return valves, except they are carried up above highest window.
- That, as far as possible, the air-flush and water-flow be in the same direction.
- That all cisterns be covered.
- That all rooms have two openings for ventilation, not more than 6 in. below the ceiling, fixed at opposite sides to secure circulation, and that the area of each be not less than 1 ft. superficial.

The chairman, in inviting discussion, regretted that so little general interest was taken in the election of Vestrymen in the metropolis; that they were practically appointed without having the salutary influence of public opinion brought to bear upon them; and, as there was a good deal of human nature in the London Vestryman, he could not be prevented from getting his relations into positions which could often be more efficiently filled by others.

Mr. Hearn (Paddington) proposed a vote of thanks, which was supported by Mr. Jerram, A.I.C.E., Mr. Colston, Mr. Richards, Mr. Fairchild, and other members, some of whom took

exception to the proposal to put a 6 in. bed of concrete around drains passing through houses, while others of them warmly supported the proposition. The vote having been accorded by acclamation, Mr. Tidman replied. The chairman announced that in consequence of a proposal to mark in some special way the attainment of the age of ninety years of their venerable President, Mr. Chadwick, the annual dinner, fixed for the 2nd of February, might be postponed to the middle of the month, to give time for the committee to mature their plans, and the proceedings then closed.

#### THE ARCHITECTURAL ASSOCIATION.

THE seventh meeting of this Association for the present session was held on the 18th inst. in the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

The following new members were elected, viz., Messrs. T. Moore, C. E. Lee, F. E. Rhodes, S. W. Whitmore, C. O. Law, and G. Vernon.

The Hon. Librarian announced the gift to the library of a book on Building Construction by Mr. F. F. Mitchell, and a vote of thanks was accorded to the donor.

The Chairman stated that, in consequence of some portion of the Birmingham Association's rules not being quite in accord with those of the Association, they were unable to take up the subject of the affiliation at that meeting. The matter would be adjourned to the next meeting, and in the meantime the rules would, as promised, lie on the table of the reading-room.

The Chairman said he regretted that Mr. Radford, who was to have read the paper for the evening, was unable, through ill-health, to be with them. They were, therefore, very much indebted to Mr. Hooper, who had come forward to fill up the gap (applause).

Mr. Francis Hooper then read a paper entitled, "Some Notes on Architectural Education and Practice in France," which we print *in extenso* in other columns.

Mr. R. Phené Spiers, in opening the discussion, proposed a vote of thanks to Mr. Hooper for giving them the result of his researches in Paris. Mr. Hooper, as they knew, had been a holder of the Bursary founded some years ago by Mr. George Godwin,\* with the desire of calling attention somewhat more to the practical than to the artistic side of the profession. The value of the Godwin Bursary had been shown by the number of papers that had been read, or had come, before the Institute, regarding what had been learned by the holders of the Bursary during their travels. To give a description of the training one had to go through in the *École des Beaux Arts* would take up too much time. It would be better to endeavour to find out the principal advantages and disadvantages of the French system. The great peculiarity in the French *atelier* was the competition for the Grand Prix, which sent the successful student for five years to Rome, and on his return provided him with some honourable employment for life. It naturally followed that the competition for such a prize was a brisk one, and entailed the studying for a longer period than was the custom in England, so that the winner of the Grand Prix was often a man of thirty, who had been earning his livelihood for ten or twelve years in architects' offices. The fact of so many students working at the same time for the Grand Prix brought them into contact with men of considerable ability. The younger students assisted the older ones in the preparation of their designs, and were termed "niggers," the only return being given in cigars and drinks, besides the advantage of having the friendship and advice of the senior men so assisted. Then, again, in the *atelier* the young student not only obtained the advice of the professor during his periodical visits, but also that of the senior students for whom he had worked. Mr. Hooper had hit upon one of the defects of the French school as compared with the English school. The French student derived his information chiefly from books and drawings, and not from actual buildings; but the great advantage gained by the English student was that the greater part of his design was done from the study of buildings, while the making of perspective drawings also gave him a better idea than the French elevation drawings did of what the effect of the buildings would be. For classic buildings, forming the

side of a street, or at the end of an avenue, the French method might be the best for producing a good result; but for buildings to be seen all round, and on all sides, the only way in which they could be judged of properly was that they should be done in perspective. The French architect had to take out his quantities and pay the clerk of works out of his commission of 5 per cent., but he was saved a great deal of work in detail drawings, for he was permitted to choose his own contractors. The contractor made all the drawings for the ironwork throughout the buildings, and somewhat the same thing would be done with the woodwork by the contractor, who knew about such things much better than the architect. The *architecte-expert* was a man who not only made a great deal of money, but who was also much esteemed by the architects themselves.

Mr. H. Lovegrove seconded the vote of thanks. The need of business experience, he said, was a most important element in professional work, and one could hardly conceive a young man starting in practice without having acquired some business experience, which could only be gained by the office work which a pupil in this country had to go through. Temporary assistance was not unknown in the architectural profession here, but, as a rule, it came in when competitions were about; and for quantity-taking temporary assistance was almost the rule. The assistance given by the elder men under the French system struck him as being a capital thing. Length of study had always been a very important factor in the education of an architect in France. Sir Gilbert Scott once remarked in that room that architects in England were too apt to take down the shutters before they had anything in the shop; and there was no doubt that many practitioners did start for themselves too early, the consequence being that they were compelled to let building-land, or to take out quantities for a living (laughter). Decorative art, too, seemed to be much studied in France, while in England it was greatly neglected. He understood the French architects took out their preliminary quantities somewhat in the form adopted in Scotland, but it must be rather awkward if they had to pay the fees themselves.

Mr. C. H. Brodie discussed the academic education in Paris must give a man very little business experience, and he would like to know how the latter was obtained? One thing which struck him in France was the way in which the elder men helped each other, and the apparent absence of business jealousy. He remembered seeing nine or ten architects in one of the suburbs of Paris, who dined together daily at a certain hour, sitting always at the same table, and discussing professional questions. The *architecte-verifyateur* was a man in general practice, who had to deal with the somewhat complicated bills of the French workmen, and, if necessary, ruthlessly cut them down. It was interesting to know that the civil code in Paris defined the position of the architect and of the contractor in case of accident to a building.

The vote of thanks was then put to the meeting, and cordially received.

Mr. Hooper briefly replied. He said he considered that the architect's education ought to be rather a costly one to himself than that it should come out of the pockets of his clients. With regard to the French architects working together, he could not but think that the military education, to which every Frenchman was subjected, had a great influence in enabling men, whether architects, painters, mechanics, or what not, to work together much more methodically than was the case in this country.

The lecture on "Bricklaying" will be given on Tuesday next, the 29th instant, at 6.15 p.m., instead of on Friday, the 25th, as previously announced.

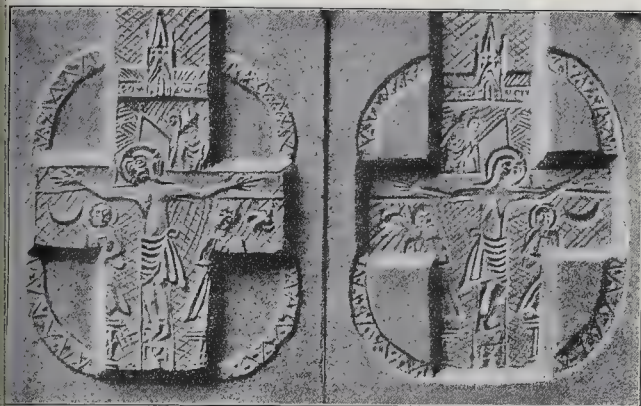
**Presentation to a Borough Surveyor.**—On Saturday last Mr. E. W. Harry, C.E., late Borough Surveyor of Harrogate, was the recipient of two testimonials from the officers and workmen in the employ of the Corporation. The presentations consisted of a set of silver-plated *epergnes*, *cruet*-stand, and illuminated address. The former was the gift of the officers and the latter the gift of the workmen. Mr. W. H. Wyles (Town Clerk) presented the testimonial of the officers, and Mr. W. Burkinshaw (mechanic) that of the workmen.

\* For many years Editor of the *Builder*.









Cast in Relief from Stone.

Ancient Incised Stone, Pirton.

de Courcy Meade, Assoc.M.Inst.C.E., Engineer to the Board.

The principal dimensions are as follows:—

|                                                               | ft. in. |
|---------------------------------------------------------------|---------|
| total height from bottom of foundation to top of capping..... | 244 0   |
| height from ground-line to top of capping.....                | 217 0   |
| outside diameter at ground-surface.....                       | 18 3    |
| inside diameter at ground-surface.....                        | 12 3    |
| outside diameter at top, under capping.....                   | 8 6     |
| inside diameter at top, under capping.....                    | 6 3     |

The bricks used in its construction were good London stocks, 9 in. by 4½ in. by 2½ in., and the work throughout is laid in English bond, with working lime-mortar in the proportion of three shames sand to one lime. No grouting was used in any part of the construction.

The foundation-bed is clay 27 ft. below ground-line. On this a block of concrete was formed, 39 ft. square and 16½ ft. deep, composed of six parts shames ballast to one of Portland cement.

The brick footings in cement are 33 ft. square at base, and built up to ground line, which is 10 ft. 6 in. on top of concrete bed, with regular offsets of 4 in. by 6½ in.

The shaft proper, starting from top of footings, is built up in six sections, commencing at the base:—

|                  | ft. in.         |
|------------------|-----------------|
| 1st section..... | 30 0 x 4 bricks |
| 2nd „.....       | 34 6 x 3½ „     |
| 3rd „.....       | 34 6 x 3 „      |
| 4th „.....       | 37 0 x 2½ „     |
| 5th „.....       | 37 0 x 2 „      |
| 6th „.....       | 21 0 x 1½ „     |
| 7th (cap).....   | 23 0 x 2 „      |
|                  | 217 0           |

The cap portion, which is constructed in white and blue Staffordshire bricks, is surmounted with a circular cast-iron capping weighing 22 cwt., set in six segments, and bolted together by lateral flanges, and forms a very good finish to this tall shaft.

A fire-brick lining, or inner shaft, is built up to height of 60 ft., the lower 30 ft. in 9 in., and the upper in 4½ in. work set in freestone. An annular space of 15 in. is left at the base, between the fire-brick lining and the main shaft to admit of expansion of the fire-brick. The top of lining nearly touches the main shaft, which is corbelled over to fire-brick lining to prevent any deposit accumulating in the annular space. Cast-iron inlets, 9 in. by 6 in., are provided at ground level to admit cold air, and to prevent the ingress striking the fire-brick lining; a 1 in. brick pier, 2 ft. high, is built between the two shafts.

Two rings at the base and one towards the top, hoop iron bonding, 1½ in. by ¾ in., are built in main shaft, about every 3 ft. 6 in. in height. The connexion between flues of boilers and trusses with main shaft is made by an arched brick opening, 9 ft. by 3 in. at the base, and a socket is also provided, whereby access can be obtained to the inside of shaft when required.

The time occupied in building this shaft was a little over five months, commencing in July and finishing in December, 1888. The bricklaying was continued all through the foggy weather in the latter month, the workmen having a clear light at least 150 ft. high, although they could not see the ground through the fog below.

A lightning-conductor is fixed to the shaft, composed of two copper tapes, or bands, 1½ in. by ¼ in., ending spirally round the outer circumference to a diameter of cap, where they are connected to a ring encircling the shaft, and from thence No. 6

copper rods, 1 in. diameter, are carried to a height of 4 ft. above cap, and terminating with crow's-foot ends. The tapes are joined at a distance of about 40 ft. from the base, north of the shaft, and 18 ft. below the ground-level, and terminate at a copper earth-plate, 3 ft. by 2 ft. by ¼ in.

Outside scaffolding was used, and, as a testimony to the careful manner in which the work was carried out, I may state that no accident whatever occurred during the construction. Clerk of works, Richard Houghton; builder, Charles Wall; foreman, Alfred Moody; scaffolder, Richard Freeman. The shaft forms a conspicuous landmark to the surrounding locality, and dwarfs all other similar structures for miles around. R. M. BANCROFT.

#### ANCIENT INCISED STONE.

SIR,—The accompanying illustration represents a photograph of a double cast from a small stone found some years ago embedded in one of the walls of the chancel of Pirton Church, Worcestershire.

That with the matrix represents the stone as now existing, and from which, according to several authorities, badges for the members of a guild were at one time cast. The stone is but a few inches in length, and the original is now in the Hastings Museum at Worcester. I have ventured to send you the photograph, partly because of the very remarkable appearance exhibited and partly in the hope that some of your readers may throw some light on the matter. HENRY LITTLEHALS.

#### THE LATE MR. E. N. CLIFTON.

SIR,—After reading the comprehensive and excellent memoir of the late Mr. E. N. Clifton in the last week's issue of the *Builder*, I am led to offer a few remarks upon what is therein mentioned respecting his early professional career. This I am enabled to do from my personal acquaintance with him, for we were contemporaries, and worked together in many ways for several years.

First, I would correct the statement made that "his career was commenced in the office of the late William Inwood as an articled pupil." The name here ought to be *Henry William Inwood*. The name given is that of his father, who was better known as a surveyor than an architect, and whose "Tables" were in those days a recognised authority. Henry William Inwood's office was at his own private residence, No. 5, Southampton-place, Euston-square (now No. 224, Euston-road), and to him, solely, both the late Mr. Clifton and myself were articled, as pupils, each for three years. It is due to Mr. Clifton to note that the facilities during his term of pupillage for his grounding in that special line of professional practice which he afterwards followed with such distinguished success, were scanty indeed. There was never much actual work stirring in Inwood's office; the nominal hours were easy, and both master and pupils generally followed pretty much the bent of their own inclinations. The following quotation from a letter of Mr. H. W. Inwood, addressed to my father, will help to confirm my assertion. "My office hours are from ten till four, or earlier or later, as my young men find they can conveniently be at the office."

There is one other statement in the "memoir" to which I must allude, and it is certainly an extraordinary one. I read as follows:—"During the time he served his articles he was engaged upon the drawings and works in connexion with the new St. Pancras Church in the Euston-road." The true counter-statement is, that St. Pancras new church had been actually completed and consecrated twelve years before Mr. Clifton entered upon his article-

ship, as proved by the respective dates, the consecration of the church having taken place in the year 1822, and the said articleship having occurred in 1834. J. DRAYTON WYATT.

January 22, 1889.

\*.\* The statement about St. Pancras was made to us by Mr. Clifton's son. We ought to have verified the dates, certainly.

#### DETERIORATION OF FRESCOS BY GAS.

SIR,—In the interest of art and artists, allow me to call your attention to the condition of the spirit fresco in St. Peter's Church, Belsize-square. This work, which I painted some eight years ago, has been practically destroyed,—for it is nothing but a wreck,—in consequence of the want of adequate ventilation in the chancel, the south wall of which the picture principally occupies. Great gas standards have liberally supplied moisture charged with other products of combustion of a destructive character, and this has been permitted to stream down the walls, scoring my painting, as with a fire-brand, in vertical marks, where greater absorption has not allowed the moisture to collect, and blur and deface the colours in wider areas. There is but faint hope for mural painting where such influences are allowed unwatched for years to work their worst. However favourably a painting may be noticed at the time of its production, there seems to be no safeguard in England that Philistine apathy will not regard it very much as a wall-paper, and of no more consideration. Happily, Sir Frederick Leighton's work at South Kensington is illuminated by electric light, and Mr. Maddox Brown's paintings in the Manchester Town Hall are out of the reach of such chances, or they would, most likely, share the fate of my picture, for "nothing will stand gas." I quote Mr. Gambier Parry's words in a letter of sympathy to me just before his death. PHILIP H. NEWMAN.

P.S. I hear the authorities have now ventilated the chancel.

Jan. 21, 1889.

#### The Student's Column.

##### TOWN DRAINAGE.

##### IV.—JUNCTIONS OF HOUSE DRAINS WITH SEWERS.

**B**EFORE a sewer is laid in a street the premises of the houses are examined to determine the line in which every drain is to be thereafter laid from the sewer, and the point at which the drain in each case is intended to pass out through the frontage is marked upon the wall in the street.

Sewers are in all cases laid in the upward direction, and a junction-piece is inserted during the construction of the sewer, about 2 ft. short of the exactly opposite position of each mark. The same is done for the street gullies, with different marks, junctions for which are also inserted in the sewer as the work proceeds. In a brick sewer the junction-piece consists of an earthenware block, built in, its ends being square to enable it to be properly set in the brickwork, but the hole through it is oblique to the line of sewer, so as to discharge the house sewage in the direction in which the sewage flows, thus interfering as little as possible with the current, for, if it enters at right angles, eddies are formed by its interruption of the flow of sewage, and settlement of dirt on the bottom takes place at those points, and as they are so numerous there would soon arise a considerable deposit of hard material on the bottom of the sewer. This, however, takes place to a greater extent from gully drains than from house drains, as they bring more heavy dirt; nevertheless, all junctions with sewers should be made obliquely.

In pipe sewers the junction-piece is formed upon one of the lengths of pipe, in one body with it, obliquely, as in the other case. A stopper is inserted into the socket of the junction in either case, made of earthenware an inch thick, and of a diameter nearly as large as the socket-space, to prevent dirt falling in when the sewer trench is filled up; for, although sometimes a house drain may be laid at the same time with the sewer, yet if systematically carried on it interferes too much with the road traffic, and, therefore, is better postponed until the sewer has been laid, and the surface made good for at least such a length as to allow the traffic to be turned to the other side of the road.

With regard to the diameter of the junctions for house-drains, it is usually 6 in. internally; in exceptional cases it may be 4 in., and in other exceptional cases, 9 in., but these are few, comparatively. When the stopper has been removed from the junction-piece, a circular bend-



pipe is inserted in its place of such radius as to make a bend of one-eighth of a circle in the length of the bend; the other eighth part, or 45 deg., being formed by the junction-piece. If the radius of the bend be 3 ft. to its centre line, and the length 2 ft. 4 in. on that line, the direction of the line of drain will be brought at right angles with the line of sewer, directly opposite the mark on the frontage below which the house-drain will pass. With this angle, a junction-block for 9 in. brickwork is 2 ft. long. If, instead of 45 deg.—which is the best angle—as much as 60 deg. be allowed, it shortens the length of the junction-block to 18 in., and a somewhat flatter and shorter bend-pipe is then required to bring the line of drain at right angles with the line of sewer; but more perfect work is made in the other way. Bend-pipes, however, are made in several different degrees of bend, and by a careful choice, a suitable one may be found for almost any angle: it is only necessary that the end of the bend-pipe fit closely all round the face of the opening in the junction-piece.

There are two different circumstances under which the Public Health Act contemplates that drains may be connected with sewers, the one compulsorily, the other as of right on the part of owners of houses and other buildings requiring drainage. The right which people have of connecting their drains with sewers is stated thus:—"The owner or occupier of any premises within the district of a local authority shall be entitled to cause his drains to empty into the sewers of that authority on condition of his giving such notice as may be required by that authority of his intention so to do, and of complying with the regulations of that authority in respect of the mode in which the communications between such drains and sewers are to be made, and subject to the control of any person who may be appointed by that authority to superintend the making of such communications."

On the other hand it is provided that where any house is without a sufficient drain the local authority shall require the owner or occupier to make a proper drain emptying into a sewer if there be one within 100 ft.

The distinction between drains and sewers is stated in the Public Health Act, 1875 as follows:—

*Drain* means any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed.

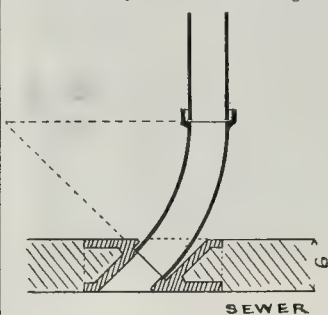
*Sewer* includes sewers and drains of every description except drains to which the word "drain" interpreted as aforesaid applies, and except drains vested in or under the control of any authority under this Act.

*House* includes schools, also factories, and other buildings in which more than twenty persons are employed at one time.

It may be observed that the word *drainage* is used, in the clauses here quoted, to signify sewage. We are bound by the law of the Act, but may read it rightly though written wrongly. Sewage surely must be sewage, as well before as after it enters a sewer. Naming its channel differently in different parts cannot alter its character. It will never do to call house-sewage "drainage," and even the waste water of manufactories must be called sewage, unless, indeed, it be separately treated and disposed of, which will probably not be often.

Whether, in any case, a house-drain be made compulsorily or not, notice is required to be given to the Town Surveyor, or left at his office, with a plan and section of the proposed drainage, a convenient scale of which is 8 ft. to an inch; but if the drains be of great extent, so as to make the plan and section unwieldy, the scale of the plan and horizontal scale of the section may be smaller, not being less than 16 ft. to an inch; but the vertical scale of the section should in all cases be at least  $\frac{1}{2}$  in. to a foot. Notice of the intention to connect a drain with a sewer is required, because it is possible that no junction-piece may have been inserted in the sewer where it is wanted, and in that case it is necessary to prevent workmen employed by the owner or occupier of a house cutting a hole in the brickwork, or in the side or top of a sewer-pipe, for the insertion of the drain-pipe, in the hurried and inefficient manner in which it would probably be done for the sake of getting the ground filled in again as soon as possible, seeing

that it is the public roadway; but although celerity of movement in such cases is admirable, it is of much less importance than sound work. In every such case a part of the sewer should be deliberately removed, and replaced with a proper oblique junction, opposite the position marked for the drain; and one of the objects in view in requiring that junctions be made under inspection is to prevent *débris*, which would unavoidably fall into a sewer during the



work, being left there. The diagram is a plan of the side of a brick sewer at the level of the junction block, at or near the springing of the arch, showing the entry of the drain at an angle of 45 deg. with the line of sewer.

## Books.

*Marks and Monograms on European and Oriental Pottery and Porcelain.* By WILLIAM CHAFFERS. (London: Reeves & Turner.)

This seventh edition of Mr. Chaffers' book will delight all who love and all who collect pottery and porcelain.

Mr. Chaffers tells us in his preface that copies of previous editions of his work are seldom to be obtained at less than the published price, a fact which fully justifies the issue of the present enlarged and improved edition.

The new chapter on Japan, extending over seventy-four pages, is full of interesting information. How difficult it is to believe that the famous Cloisonné enamel was unknown in England before the Great Exhibition of 1851! And it is sad to learn that, as in so many departments of art, the works of fourteenth and fifteenth-century masters are superior to the productions of more modern date.

In the same way the products of Delft, whose porcelain-like surface was formerly decorated by painters of merit, possibly even by one with whom Browning has thought it worth his while to hold a parleying, Gerard de Laireisse, gradually lost all artistic merit, and, according to the Darwinian law, became extinct.

We do not notice that Mr. Chaffers mentions the modern manufacture of delft-ware by Messrs. Joost, Thooff, & Co., from which we have seen very meritorious specimens.

We should also have liked his thoughts upon some of our modern English revivals of extinct porcelain manufactures; of that, for instance, at Derby, the gorgeous decoration of whose vases so often completely conceal the material of which they are made. It is said they please the Americans, possibly, may be, in the same way in which Pope tells us his books pleased their owner:—

"Lo, some are vellum, and the rest are good,  
For all his Lordship knows, but they are wood."

Be this as it may, we can confidently advise all who love its subject to purchase this admirable edition of an able and interesting book.

*Letters from Majorca.* By CHARLES W. WOOD, F.R.G.S. (London: R. Bentley & Son, 1888.)

This is a work of no interest from our point of view in regard to its literary matter, which seems, indeed, to be of a very superficial character; but the excellence of the illustrations is worth a word of recognition. Many of these represent architectural subjects: bits of street architecture, sketches of the exteriors and interiors of churches, and are executed with more perception of architectural effect and with a better touch and style than is usually the case in books of this class. No name is appended to them, but we understand they are

by Mr. Brewer, the son of Mr. H. W. Brewer, the well-known architectural artist.

*The Remedy for Landlordism, or Free Land Tenure.* (London: Kegan Paul & Co., 1889.)

This is one of those empirical and silly books which foolish men, imagining that they are sages, from time to time publish. While every sensible person would make land as easily transferable as possible, no one who understands his subject would make changes without due consideration and careful thought. The author of this book would begin in a light and airy fashion by dividing "the whole of the British Isles into provinces (not more than 1000) for home government." It would be a waste of time to say anything more about work which makes no attempt to consider the present condition of things with any thoroughness, and propounds changes as if the writer had to deal with a newly-discovered and uninhabited country.

*The Co-Operative Traveller Abroad.* By E. C. GREENING. (London: Arthur Standish, 1888.)

We have been trying to find out why a co-operative traveller should have anything new to tell us about Notre Dame, or even of the descent in a steamboat of the Thames. So far as we have been able to discover, the co-operative traveller is not blessed with any peculiar gifts which excuse him for printing a great deal of travellers' trash. "The two lofty square towers [of Notre Dame], said to be 235 ft. high, look squat and short," which is not architectural criticism of the highest order.

To tell the truth, Mr. Greening would have done well not to have published this book except the portions which relate to M. Godin's co-operative experiments at Guise. There are some interesting facts in relation to the gentleman's work, showing, for example, how he gives a due proportion of profits to labour and capital. We could hardly, however, give long enough extracts as to this point without practically taking the pith out of the entire book. As it only costs one shilling, our readers would not be ruined by buying it.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

17,674, Improved Closet-pan. F. P. and R. L. Pyne.

The external sides of the pan, which form the subject of this patent, are raised above the water-rim, as carried over the top of the pan and extending downwards towards the interior to such a distance as covers the under water-rim. A free passage of air is allowed between the side and the top of the water-rim. At the back of the pan an outlet for connection to a ventilating shaft is formed.

1,980, Lime, Natural, and Artificial Cement. W. E. Heys.

The improvements, which are the subject of the patent, consist chiefly in burning the limestone, chalk, or slurry. The raw material, after being packed in a kiln, instead of being ignited, as usual, at the bottom, is ignited at the top, as allowed to burn downwards. As soon as the fuel is burnt through, the eye of the kiln is closed, to prevent access of air. After cooling, the calcined material is ground similarly to cement or plaster ground or mixed with other suitable substances.

2,482, Improvements in Water-closets. Bartholomew.

The improvement suggested by this inventor is in the use of a hopper-basin, under which are placed two water-seals or traps. The whole can be made in one, two, or three pieces, as desired. A small opening is made for the escape of the air. Water is supplied to the arm in the usual way, and the cistern is provided with a bent tube, one end of which dips nearly to the bottom of the cistern, and can be open or closed with a flap-valve. The action of the mechanism is to bring compressed air into action, so as to suck up the water and contents of the pan, passing them to the soil-pipe, while the after-charge provides a special flush.

2,803, Artificial Stone. J. Brunton and Griffiths.

The addition to the usual component parts of artificial stone is carbonate of potash and azotic acid, other equivalent acid, which will combine with the silicate and form an insoluble silicate of lime, the power of the stone. The compound is pressed in moulds, and when hard can be further hardened by means of a bath of alkaline silicate.

16,069, Nail or Staple. A. Erdmann.

According to this invention, a plain flat piece of metal is first cut with pointed ends and small oval



ations. It is then turned over in the form of a  
ole, and used to fasten boards or planks when  
ed and to end. The corrugations serve to hold  
staple more firmly in the wood.

NEW APPLICATIONS FOR PATENTS.

an. 8.—304, J. Sutcliffe, Window Sash-fasteners.  
08, J. & T. Hill, Substitute for Plaster of Paris  
for Potters' Moulds.—354, S. Fisher, Wall  
pings, &c.—355, F. Trier, Stone-working  
phinery.—368, H. Crews, Convertible Steps and  
ding Ladder.  
an. 9.—379, W. Baker, Plastering-machines.—  
G. Elliott, Chimney-top Cowl.—403, E.  
not and F. Durand, Chimney-cowl.—412 and  
U. Smith, Sewerage.—420, R. Scott, Bakers'  
ns.  
an. 10.—460, A. Johnstone, Mitreing and  
mping Wooden Mouldings.—463, M. Syer, Ball  
ile, &c.—469, G. Fry, Warning and Ventilating  
achines, Houses, &c.—482, J. Tollerston and J.  
riley, Safety Fasteners for Doors and other  
ts of Theatres, Buildings, &c.—495, F. Carter  
others, Combination Nail and Screw.  
an. 11.—512, J. McPhinn, Mortising-machine.—  
A. Day and F. Green, Window Sash-fasteners.  
17, S. Hazeland, Wood-planing Machines.—522,  
G. Raising and Lowering Windows.  
an. 12.—581, J. Walker and T. Pogue, Lightening  
elling-bushes, Public Buildings, &c.—589, J.  
nsley, Ventilating Apartments, Buildings, &c.  
24, C. Thode, Automatic Door Hinge and Check.  
82, G. Jennings, Valves for Water-closets.—639,  
Jennings, Water Waste-preventers for Water-  
closets.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,004, P. Mugford, Securing Tiles in Fire-grate  
aba.—16,285, J. Nicholls, Window Sash-holder,  
Burr-alter-proof Bolt.—16,710, H. Norris, Imi-  
on Stained Glass, &c.—17,250, T. Edwards, Fire-  
rises and Ladders.—17,372, G. Stephan, Movable  
rider Sawing-machines.—17,545, S. Jennings,  
atically closing Orifices of Pipes, &c., in  
nection with Drainage, &c.—17,966, C. Saun-  
s, Scales for Use in Enlarging or Reducing Plans,  
17,995, J. Hewison, Set-square.—18,038, J.  
ebman and J. Alefreet, Securing Sash-lines to  
hes.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

96, F. Weber, Hot-air Drying and Heating Ap-  
atus.—1,893, S. Ridge, Door-springs.—2,191, J.  
ingham and W. Hodgson, Cutting Mitres with  
on-saw, &c.—3,012, S. Hillyer, Ventilating  
charge-pipes or Passages in Connection with  
ter-closets, &c.—3,085, H. Smith, Securing  
adies on Door-spindles and Releas-ing them when  
eared.—3,155, J. Lowen, Rain-water, Drain  
es, &c.—3,244, W. Beames and J. Madley,  
shing Cisterns.—3,680, D. Pugh, Sanitary Traps.  
695, R. Roberts, Prevention of Down-draught  
l chimneys.—3,882, J. Breeden, Flushing Water-  
ets, &c.—4,182, R. Harrison, Opening, Closing,  
Adjusting Fanlights, &c.—4,409, C. Brothers,  
it-and-Miss Ventilators.—4,581, P. Ayton,  
ement and other Stays.—4,687, L. Cochepeain,  
ping Carls, &c.—5,168, C. Brothers, "Hit-and-  
Miss" Ventilators.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

| JAN. 15.                                                                                                                     |       |
|------------------------------------------------------------------------------------------------------------------------------|-------|
| By DEBENHAM, TEWSON, & CO.                                                                                                   |       |
| Head-7, Lincoln-street, freehold                                                                                             | £500  |
| Freehold rent charge of £36 a year, from the Isle of Wight Railway                                                           |       |
| By GEO. GODFREY SMITH, Esq., & Co.                                                                                           | 950   |
| Easton-square—No. 12 and stabling, 38 years, ground rent £60                                                                 | 2,950 |
| By R. B. RICE—The Railway Hotel, 78 years, ground-rent £50                                                                   | 910   |
| JAN. 16.                                                                                                                     |       |
| By WARD & CLARKE.                                                                                                            |       |
| Leath—165, 167, and 169, Waterloo-road; 26 and 28, Webster-street; and 1 to 7, Cottage-place, 82 years, ground-rent £42. 1s. | 1,125 |
| JAN. 17.                                                                                                                     |       |
| By NEWSON & HARDING.                                                                                                         |       |
| Lea Newington—104, 114, and 115, Abchurch-lane, freehold                                                                     | 1,606 |
| ton—3, Napier-street, 13 years, ground-rent £2. 10s.                                                                         | 135   |
| JAN. 17.                                                                                                                     |       |
| By F. J. BISLEY.                                                                                                             |       |
| Merthyr—262, Rotherhithe-street, freehold                                                                                    | 415   |
| Aspenden-road, 64 years, ground-rent £1                                                                                      | 340   |
| Warndon—104, 114, and 115, Abchurch-lane, freehold                                                                           | 370   |
| 10, and 12, Warndon-street, 67 years, ground-rent £12                                                                        | 635   |
| 40, 42, and 44, Westlake-road, 67 years, ground-rent £16                                                                     | 690   |
| Cross—27, Casella-road, 68 years, ground-rent £5                                                                             | 370   |
| Leath—37 and 39, Woolwich-road, freehold                                                                                     | 385   |
| and 40, Woolwich-road, freehold                                                                                              | 455   |
| and 42, Woolwich-road, freehold                                                                                              | 120   |
| ground-rent of £4, reversion in 63 years                                                                                     | 120   |
| ground-rent of £4, reversion in 63 years                                                                                     | 120   |
| Monday—13, Lockwood-road, 56 years, ground-rent £3. 10s.                                                                     | 265   |

Mr. J. Douglass Mathews has been elected  
sweyer to the Tallow Chandlers' Company.

MEETINGS.

SATURDAY, JANUARY 28.

St. Paul's Ecclesiastical Society.—Annual Meeting. 2.30 p.m.

MONDAY, JANUARY 28.

Royal Institute of British Architects.—Public Presentation of the Studentships, Medals, and other Prizes. The President (Mr. Alfred Waterhouse, R.A.), will deliver an Address to Students. 8 p.m.

Royal Academy of Arts.—Professor Aitchison, A.R.A., on "Roman Architecture." I. 8 p.m.  
Surveyors' Institution.—Mr. Josiah Hunt on "Quantity Surveyors, their Duties, Rights, and Liabilities." 8 p.m.  
Society of Arts (Cantor Lectures).—Mr. Alan S. Cole on "Egyptian Tapestry and Textiles." II. 8 p.m.

TUESDAY, JANUARY 29.

Institution of Civil Engineers.—(1) Mr. J. Carruthers on "The Steep Incline on the Puerto Cabello and Valencia Railway, Venezuela." (2) Mr. R. Wilson on "The Cost of Working the Hartz Mountain Railway." (3) Mr. J. P. Maxwell on "Further Information on the Working of the Fell System on the Rimau Incline, N.Z." 8 p.m.  
Society of Arts (Foreign and Colonial Section).—Mr. T. W. Good on "Gold and Silver Mining in Colorado." 8 p.m.

WEDNESDAY, JANUARY 30.

Institution of Mechanical Engineers.—Forty-second Annual General Meeting, for consideration of Annual Report, and Election of President, Vice-President, Members of Council, &c. The following papers will be read and discussed, as far as time permits: (1) Mr. Thomas Urquhart on "The Use of Petroleum Refuse as Fuel in Locomotive Engines." (2) Mr. R. H. Lapage on "Compound Locomotives." (3) Mr. H. Simon on "The Latest Development of Roller Flour Milling." 7.30 p.m.  
Inventors' Institute.—8 p.m.  
Society of Arts.—Mr. Conrad Beck on "The Construction of Photographic Lenses." 8 p.m.

THURSDAY, JANUARY 31.

Royal Academy of Arts.—Professor Aitchison, A.R.A., on "Roman Architecture." II. 8 p.m.  
Society for the Encouragement of the Fine Arts.—Dr. G. G. Zeehl on "Evolution in Art." 8 p.m.  
Royal Institution.—Professor J. W. Judd, F.R.S., on "The Metamorphoses of Minerals." II. 8 p.m.  
Sanitary Institute.—Professor F. Jeffery Bell on "The Worm Parasites of Human Food." 8 p.m.  
Institution of Mechanical Engineers.—Annual General Meeting (continued). 7.30 p.m.  
Society of Antiquaries.—6.30 p.m.

FRIDAY, FEBRUARY 1.

Architectural Association.—Mr. J. Slater, B.A., on "Artificial Illumination." 7.30 p.m.  
Institution of Mechanical Engineers.—Annual General Meeting (continued). 7.30 p.m.

Miscellaneous.

**Ship Canal between the Bristol and English Channels.**—According to the *Times* of the 19th, a scheme for connecting the Bristol and English Channels will be brought prominently before the public in the course of a few months. The route fixed upon by the engineers who have recently surveyed the district is from Stolford, in Bridgewater Bay, passing through the towns of Bridgwater, Langport, Ilminster, and Chard, to Seaton, on the English Channel. The total length of the canal will be about forty-five miles, and, with the exception of the Chard range of hills, the work of excavating, &c., for the whole distance will be comparatively easy, no engineering difficulties presenting themselves. The Chard district is formed of lias, so that, in excavating through the high ground, an ample supply of lime will be obtained, which will be useful for the other portions of the work. The canal is intended to be in every way capable of admitting the largest mercantile steamers afloat, as well as ships of war.

**New Harbour at St. Petersburg.**—The Russian Government, says the *Novosti*, has decided upon constructing a new harbour at St. Petersburg. It is to be situated by the Guterger Island, and to afford accommodation for some hundred vessels, the cost being estimated at about 550,000*l.* It is to be in direct communication with the capital by rail. The Minister of Finance, on the other hand, proposes to construct the harbour at Wassili-Ostrov, where the cost will be 100,000*l.* less; but there will be no railway communication.

**The Great Log Rafts.**—Mr. Robertson, who last year floated the large timber raft from Joggins, Nova Scotia, to New York, has, we learn, been so much encouraged by his success that he proposes to extend his operations. He intends to form a syndicate for promoting the new mode of transporting logs to market. A raft containing about 8,000,000 ft. of timber is to be built on the coast of Washington Territory, and navigated to Valparaiso. Other rafts are to be constructed in Washington and Oregon Territories for the San Francisco market.

**The Yates Professorship of Archaeology.** It is stated that Mr. Reginald Stuart Poole, Keeper of Coins in the British Museum, has been elected Yates Professor of Archaeology at University College, London, in the place of Sir C. T. Newton, resigned.

**The English Iron Trade.**—The English iron market continues steady, under the influence of a well-sustained demand and a still better outlook. Pig-iron is slightly stronger. The Glasgow warrant market has been quiet during the week, but, local consumption being large, and foreign inquiry satisfactory, makers' iron has remained steady, barring a few slight changes. Middlesbrough pig maintains its quotation of 34*s.*, pig-metal in other districts showing rather a rising tendency. In the North of England, hematite pig has advanced to 46*s.* 6*d.* for mixed parcels of iron, while in the north-west it is firm at 45*s.* An improvement is expected in old materials. Business in manufactured iron is still active, the higher prices previously noted being easily secured. Trade in tin-plates is quiet, due not to any absence of buyers, but rather to the firm stand of makers. Shipments of tin-plates are at present unusually heavy, last week's being amongst the biggest on record. Steel-makers are unable to meet the demand, for early delivery at any rate, of ship material. There is also a heavy inquiry for rails, but prices do not seem to move much. Shipbuilders continue booking fresh orders, and they, as well as engineers, have good prospects before them.—*Iron.*

**The New Christiansborg Palace at Copenhagen.**—The Royal Commission selected for considering the designs for the new Christiansborg Palace at Copenhagen, on the site of the edifice burned some years ago, have arrived at their decision, and announce that in all thirty-two designs have been received, of which seven have been found worthy of remuneration, but that only two of them can be taken into consideration in deciding upon the final design for the building, and that only as regards the leading motif. It is added, however, that one of the plans is distinguished by its admirable situation of the Houses of Parliament (which were to be located in a wing of the Palace), and the other by its suggestion of rebuilding the edifice as a Royal Palace alone, whereby the extent of the building would be greatly reduced, and, consequently, also its cost. The latter question is still under consideration, although the Commission has decided that the Palace and Houses of Parliament shall not be contiguous to each other, nor two separate buildings erected on the site. The Danish Parliament, it is stated, is willing to vote the money for the new buildings.

**Proposed Municipal Buildings at Gloucester.**—A quarterly meeting of the Gloucester Town Council was held on Tuesday, Mr. Vassar-Smith presiding. The principal subject discussed was the proposal to offer three premiums of 100*l.*, 50*l.*, and 30*l.* for designs for new municipal buildings. The Council have already purchased for £4,500*l.* Sir Thomas Rich's school property in Eastgate-street, and propose to pull down the property and erect suitable premises, including a Council Chamber and all the necessary municipal offices. This would enable them to vacate the Toley and the Corn Exchange, at present occupied by the Council, from which it is believed a sufficient rental could be obtained to repay the entire expenditure. Mr. Trevor Powell and others objected to the proposed expenditure as extravagant and unnecessary, and challenged the Council to submit their policy to the ratepayers next November. Mr. Peters submitted a scheme for improving the Toley and purchasing adjoining premises at a total cost of 7,500*l.*, as against, at least, 16,000*l.*, at which the cost of the Eastgate-street plan is estimated. On a division the proposal of the Council was carried by eighteen to eleven.

**Royal Society of Painter-Etchers.**—We are informed that, by an arrangement between the two societies, the next and future exhibitions of the Royal Society of Painter-Etchers will be held in the Spring of each year in the Gallery of the Royal Society of Painters in Water-Colours, 5a, Pall-mall East.

**Technical Instruction in Carpentry.**—The *City Press* says that the Court of the Carpenters' Company contemplate initiating a scheme for teaching in a thoroughly practical manner the art of woodwork. The money for the purpose has been placed at the disposal of the court by a liverman.

**Sanitary Storeware and Fire-brick Goods.**—Through the increased cost of coal and other materials the Midland sanitary pipe and firebrick manufacturers have issued a new list of prices, which came into operation on January 1st.



**Fine Art and Industrial Exhibition at York.**—It has been decided to hold "a Fine Art, Ecclesiastical, Educational, and Industrial Exhibition" at York, in the buildings and grounds of the Fine Art and Industrial Institution, from June to October, 1889. It is intended (according to the prospectus) that the exhibition shall be of a superior character, especially in respect to the quality of the exhibits, and that every effort will be made on the part of the management to exclude such articles as are not strictly appropriate to the objects of, or which might tend to lower the tone of, the exhibition. Diplomas of honour, diplomas for gold and silver medals, and diplomas will be awarded by competent jurors or experts to such exhibitors in each department or section as may be deemed entitled thereto. The jurors or experts will be empowered to award medals in addition to the diplomas should they deem the exhibit of sufficient merit. Arrangements have been made with the committee of the County Hospital (founded 1740) and the directors of the City Dispensary (founded 1788) at York, that a part of the cash receipts for admission shall be handed to those charities, thus ensuring to each institution a positive benefit from the opening until the close of the exhibition. The Fine Arts Section, we are told, will form an important part of the exhibition, and will be large and representative, including oil paintings, water-colour drawings, etchings, engravings, statuary, photographs, &c. The Ecclesiastical Section will occupy a prominent part of the great hall, forming an extensive and varied display of church furniture, fittings and decoration, textile fabrics, stained glass, mosaics, &c. In the Educational Section it is desired, among other objects, to illustrate "the application of the arts and sciences to various industries, particularly those adapted to technical education." The Industrial Section will occupy a large space in the grounds in buildings specially erected, and will illustrate a selected number of interesting trades and handicrafts in operation. Mr. Joseph Davis, late of the Anglo-Danish Exhibition, has been appointed Secretary and General Manager of the Exhibition.

**Aberdeen.**—The tenders for the first part of the works of the reconstruction and extension of the Royal Infirmary having been found to exceed the estimates by about 4,000l., and the managers not having sufficient funds, it was resolved on Tuesday that the matter be remitted to the directors to cause the whole of the details and specifications to be scrutinised, with a view of reducing the cost. The hospital depends on voluntary contributions, and, considering that there is only 30,000l. in hand to meet an estimated expenditure of 39,000l. at the commencement, the pause of the directors is not to be wondered at. It is also reported that the Prison Authorities have found four acres of ground at Craigieches, overlooking the Wellington Suspension Bridge and the valley of the Dee, for a new prison, the old one having been condemned. Few convict buildings command such a prospect. The cost of site will be 2,400l., or 600l. an acre, and of the buildings from 20,000l. to 30,000l. It is expected that the old prison in Lodge-walk, in the city, although unsuitable as a place for a permanent penitentiary, will be utilised as a temporary lock-up and office by the City police.

**St. Michael's Church, Coventry.**—In consequence of some correspondence which has lately appeared in *Church Bells* respecting the comparative sizes of our great parish churches, Mr. G. R. Webster, Clerk of the Works for the Restoration Committee, sends to that journal the following particulars, being the results of a careful survey, viz.:—

|                                                               |              |
|---------------------------------------------------------------|--------------|
| <i>Interior.</i> —Superficial area, including the tower ..... | 23,758 feet. |
| <i>Vestries.</i> —The ancient portion, 478 ft. ...            |              |
| The new additions, 608 ft. ....                               | 961 "        |
| <i>Porches.</i> —The west porch, 80 ft. ....                  |              |
| The south porch, 188 ft. ....                                 | 276 "        |
| Total area of the Interior .....                              | 24,015 feet. |

**The Competition for New Houses of Parliament and a National Bank in Stockholm.**—The Royal Commission appointed to draw up the programme for the competition for the new Houses of Parliament and a National Bank in the Swedish capital, to which we recently referred, have now decided that only Swedish architects can compete. There are to be five premiums for the best designs, viz. one of 350l., one of 280l., and three of 200l., with an additional 210l. for the design accepted. They are to be sent in before December 15, 1889.

**A New Building Estate in Upper Tooting.**—A large estate, upwards of twenty acres in extent, situated on the east side of the main high road between London, Tooting, and the Merton and Wimbledon district, is about to be laid out for the erection of between three and four hundred houses. It is known as the Lower Streatham Park Estate, and for several years past has been in the occupation of Mr. Macmillan, the eminent publisher, in connexion with his mansion in Tooting Bec-road. Mr. Macmillan having just completed a costly new mansion in Hampshire as his country residence, he has presented to the Bishop of Rochester his seat in Tooting as a residence for the Right Rev. Dr. Barry, at present Bishop of Sydney, but who has accepted the office of Assistant Bishop of the diocese of Rochester. The mansion is now undergoing alterations, so as to adapt it to the requirements of the Bishop, who will take possession of it on his arrival from Sydney at Easter. The Lower Streatham Estate is situated near the centre of Upper Tooting, about midway between Balham and Lower Tooting, and has a frontage to the main high road upwards of 800 ft. in length, extending eastward in the direction of Streatham to a depth of about 1,000 ft., along which several new roads are about to be formed, approached from the main high road. A committee has been formed for promoting the erection of a new public hall, centrally situated between Upper and Lower Tooting, the want of which is much felt in consequence of the great increase of building going forward in the district, and it is expected that a site will be secured on the Lower Streatham Estate.

**Public Works at Bootle-cum-Linacre.**—At a meeting of the Council of the Borough of Bootle-cum-Linacre, last week, the Watch Committee of the Corporation were authorised to obtain competitive plans and estimates of the cost of a new Police Station and Court-house, to be erected on land belonging to the Corporation, adjoining the Free Library and Public Baths, and to offer premiums of fifty, thirty, and twenty guineas, for the three designs that should be adjudged first, second, and third in point of merit. The cost of the proposed buildings, exclusive of furniture and fittings, is not to exceed 8,000l. The Corporation have also had their attention called to the desirability of improving the means of communication between the eastern and western sides of the borough, which are separated by the Leeds and Liverpool Canal, and at present all the bridges crossing this canal are almost impracticable for the heavy traffic of the docks and warehouses. The Improvement Committee were requested to give the matter their attention, and the Borough Surveyor is to report on the best method of carrying out some improvement, either by means of hydraulic swing bridges or by the construction of new bridges with considerably improved approaches, so that a passable gradient may be obtained.

**St. Stephen's Cathedral, Vienna.**—For some time past signs have not been wanting that serious mischief is going on in the stone work of this building. In order to assist him with the best possible advice, the architect to the Chapter, Oberbaurath Freiherr von Schmidt, got together a committee of experts who have just published their report. They find that the copings of gables and all finials and crockets have perished to a dangerous degree, owing to the chemical action of certain inferior cements used in the joints. The roof of nave and choir is of wood, and is described as "a perfect forest," implying much unnecessary material,—so rotten and so dry that a fire would be fatal, not only to the Cathedral itself, but to all the surrounding and densely-populated property. In view of this state of things the Committee declines to trust to all the buckets, hoses, and extinguishers already provided, and advises the substitution of an iron roof. Lastly the report treats of the bells. The celebrated large one, cast in 1711, and one of the largest in Europe, has not been heard for many years, owing to the insecure state of the tower (the higher one of the two) in which it hangs, and the Committee recommends its removal to the other, hung at a lower altitude, and capable of being worked as before.

**Mr. Stanford's New Premises, Cockspur-street.**—With regard to this building, illustrated and described in our issue of the 12th inst., we are asked to mention that the two hydraulic lifts spoken of were made by Messrs. R. Waygood & Co.

**The Fatal Fall of a Building in Birmingham.**—Mr. H. Hawkes (Coroner) opened an inquest on the 18th inst. into the circumstances attending the deaths of Henry Mann (35), bricklayer's labourer, William Clewes (44), bricklayer, and Paul Poole (43), bricklayer, who died from injuries received by the collapse of a wall in Lawley-street on the 16th inst. as mentioned in last week's *Builder*. The bodies having been identified, Mr. Alexander Ross, civil engineer, Cato-street, said that he was manager for Messrs. Nelson & Company, who were contracting for the London and North-Western Railway Company to pull down certain buildings in Lawley-street, to provide for alterations required by the railway company. The contract had been sublet to Mr. Pearson, of Trevor-street. It was completed on the 1st inst., when Mr. Pearson's work ceased. Concrete had been laid on the floor of the cellars to form a foundation for the piers of a bridge. The contract for the brickwork, being the next stage, was sublet to William Swift, of Winslow-green, and he commenced work on the 14th inst. It was necessary to leave the one gable wall of the tavern standing, because it acted as a gable to the adjoining house. Swift's contract did not deal with the wall. Against the wall was a chimney-stack which had been left as a support to the gable wall. At eleven o'clock on the morning of the accident Swift told witnesses that he should have removed the chimney-stack to make room for the pier. Witness told him that it could not be removed, and that he would not take the responsibility of undertaking the work. Swift said he thought it would be safe, and witness then left. Replying to the Coroner, witness said he believed the words he used were "You must not remove it." The Coroner here remarked that it was his intention to adjourn the inquest, and asked the legal gentlemen present if under those circumstances they proposed to reserve their cross-examination of the witness until the adjourned meeting.—After short consultation it was agreed to adopt the course suggested by the coroner. Charles Collins, Hope-street, said that he was passing down Lawley-street at ten minutes to twelve the morning of the accident. He saw Swift standing near the chimney-stack, and there were some other men standing near whom he knew. Two of the jambs of the stack had been cut through, and he heard Swift tell one of the men to knock away the lower portion of the stack with a sledge-hammer. The man commenced to strike the sides of the stack with a sledge. Witness noticed that it looked like falling, and calling out to the man "Don't strike again, or it will be down." The man struck while he was speaking, and the structure collapsed. Witness, seeing that some men must have been hurt, went for assistance, and the men were taken to the General Hospital. The men were about 15 ft. or 16 ft. from the stack. He saw Swift afterwards, and said to him, "You are the man who caused those men's death," and he made no answer. The inquiry was adjourned until the 29th inst.—(Condensed from report in the Birmingham Daily Gazette of the 19th inst.)

**New Printing Offices at Leicester.**—Saturday evening last, the combined staffs of the *Leicester Daily Post*, *Daily Mercury*, a *Chronicle* and *Mercury* were entertained at dinner by the proprietors, Messrs. Hewitt & Co. in celebration of the completion of the new offices in Albion-street. Mr. Hewitt presided, and the vice-chairs were occupied by Mr. Hewitt, jun., and Mr. Thomson. The gathering numbered seventy. Referring to the new building, Mr. Hewitt said he thought they would agree with him that it was exceedingly satisfactory and admirably adapted for its purpose. A great deal of time had been spent by J. Jackson, the architect, and others, who had been most painstaking in securing that arrangements should be as convenient as possible. He did not believe there were many provincial newspaper offices in Great Britain Ireland which excelled it—(cheers)—and wished to express his obligations to the architect, to Messrs. Herbert, the builders, and all the contractors, for the faithful and satisfactory way in which they had done their work. **Dissolution of Partnership.**—Mr. J. Stevens Hellyer, of 21, Newmarket-street, Strand, informs us that his friend, J. Dent, owing to weight of years, has retired from the partnership which for a long period has subsisted between them. The business will be continued by Mr. Hellyer alone, under the style of "Dent & Hellyer."



**The New Railway Station at Vauxhall.** After taking between four and five years in execution, the doubling of the London and South-Western Railway from Waterloo to Vauxhall is now approaching completion, and preparations are making for the rebuilding of the Vauxhall Station, which is immediately to be commenced. For the purpose of doubling the line more than 400 houses and business premises have had to be purchased. The completion of the work will give eight lines of metals between the two stations, four of these being in connexion with the main line, and four on the 'indoor' line. The new station will be considerably more than double the area of that which it replaces, being upwards of 1,000 ft. in length and about 200 ft. in width, thus occupying an area of something like four acres. There will be several central and side platforms for both the up and down traffic, each platform being about 800 ft. long. There will be spacious waiting-halls, with first and second class waiting and refreshment rooms in connexion with both, together with parcel and telegraph offices, and station-master's and a full suite of other offices. It is expected that when the new station is completed and opened there will be a considerable diversion of traffic from Waterloo, passengers from the West End making use of the new station by arriving at it by way of Vauxhall Bridge. In order to accommodate the traffic, one feature of the new station will be the construction of carriage-ways on each side of the station. These carriage-ways will be reached by inclines from the street level, with the exception of the principal terminus at Waterloo, and Portsmouth. Southampton, and other main termini, the station will be one of the largest on the company's system. The estimated cost of the station is between 35,000 and 40,000.

**Water Companies and Plumbers.**—The directors of the New River Company have issued a circular in which they inform all applicants who desire to have their names placed on the list of recommended plumbers printed the back of the notices served by the company that it will be necessary for them to obtain certificates from the Plumbers' Company that they are efficient workmen, and registered at that Company. This seems to be the first step of the kind taken by the London water companies.—*Morning Post.*

**Competition: Lethersdale Schools.**—The recent competition for the Lethersdale Schools, the Carleton School Board, Skipton, Yorks, in which we are informed, resulted in the design submitted by John Shewell Corder, of Ipswich, being placed first.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                        | £. s. d. | £. s. d. |
|--------------------------------|----------|----------|
| Heart, B.G. .... ton           | 6 10 0   | 7 10 0   |
| Oak, E.I. .... load            | 9 0 0    | 14 0 0   |
| Walrus, U.S. .... foot cube    | 0 2 8    | 0 3 0    |
| Canada .... do                 | 0 10 0   | 0 10 0   |
| " .... do                      | 3 10 0   | 6 0 0    |
| " .... do                      | 4 0 0    | 6 0 0    |
| Danish, &c. .... do            | 2 0 0    | 4 0 0    |
| Canada .... do                 | 5 10 0   | 7 10 0   |
| Canada red .... do             | 3 5 0    | 4 0 0    |
| Canada yellow .... do          | 3 10 0   | 5 10 0   |
| Canada fair .... do            | 4 10 0   | 5 10 0   |
| Canada, 4th and 3rd .... do    | 7 0 0    | 8 10 0   |
| Canada, 2nd and 1st .... do    | 10 0 0   | 15 0 0   |
| Canada, 1st and 2nd .... do    | 8 0 0    | 10 10 0  |
| Canada, 2nd and 3rd .... do    | 7 10 0   | 10 10 0  |
| Canada, 3rd and 4th .... do    | 7 10 0   | 10 10 0  |
| Canada, 4th and 5th .... do    | 7 10 0   | 10 10 0  |
| Canada, 5th and 6th .... do    | 7 10 0   | 10 10 0  |
| Canada, 6th and 7th .... do    | 7 10 0   | 10 10 0  |
| Canada, 7th and 8th .... do    | 7 10 0   | 10 10 0  |
| Canada, 8th and 9th .... do    | 7 10 0   | 10 10 0  |
| Canada, 9th and 10th .... do   | 7 10 0   | 10 10 0  |
| Canada, 10th and 11th .... do  | 7 10 0   | 10 10 0  |
| Canada, 11th and 12th .... do  | 7 10 0   | 10 10 0  |
| Canada, 12th and 13th .... do  | 7 10 0   | 10 10 0  |
| Canada, 13th and 14th .... do  | 7 10 0   | 10 10 0  |
| Canada, 14th and 15th .... do  | 7 10 0   | 10 10 0  |
| Canada, 15th and 16th .... do  | 7 10 0   | 10 10 0  |
| Canada, 16th and 17th .... do  | 7 10 0   | 10 10 0  |
| Canada, 17th and 18th .... do  | 7 10 0   | 10 10 0  |
| Canada, 18th and 19th .... do  | 7 10 0   | 10 10 0  |
| Canada, 19th and 20th .... do  | 7 10 0   | 10 10 0  |
| Canada, 20th and 21st .... do  | 7 10 0   | 10 10 0  |
| Canada, 21st and 22nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 22nd and 23rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 23rd and 24th .... do  | 7 10 0   | 10 10 0  |
| Canada, 24th and 25th .... do  | 7 10 0   | 10 10 0  |
| Canada, 25th and 26th .... do  | 7 10 0   | 10 10 0  |
| Canada, 26th and 27th .... do  | 7 10 0   | 10 10 0  |
| Canada, 27th and 28th .... do  | 7 10 0   | 10 10 0  |
| Canada, 28th and 29th .... do  | 7 10 0   | 10 10 0  |
| Canada, 29th and 30th .... do  | 7 10 0   | 10 10 0  |
| Canada, 30th and 31st .... do  | 7 10 0   | 10 10 0  |
| Canada, 31st and 32nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 32nd and 33rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 33rd and 34th .... do  | 7 10 0   | 10 10 0  |
| Canada, 34th and 35th .... do  | 7 10 0   | 10 10 0  |
| Canada, 35th and 36th .... do  | 7 10 0   | 10 10 0  |
| Canada, 36th and 37th .... do  | 7 10 0   | 10 10 0  |
| Canada, 37th and 38th .... do  | 7 10 0   | 10 10 0  |
| Canada, 38th and 39th .... do  | 7 10 0   | 10 10 0  |
| Canada, 39th and 40th .... do  | 7 10 0   | 10 10 0  |
| Canada, 40th and 41st .... do  | 7 10 0   | 10 10 0  |
| Canada, 41st and 42nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 42nd and 43rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 43rd and 44th .... do  | 7 10 0   | 10 10 0  |
| Canada, 44th and 45th .... do  | 7 10 0   | 10 10 0  |
| Canada, 45th and 46th .... do  | 7 10 0   | 10 10 0  |
| Canada, 46th and 47th .... do  | 7 10 0   | 10 10 0  |
| Canada, 47th and 48th .... do  | 7 10 0   | 10 10 0  |
| Canada, 48th and 49th .... do  | 7 10 0   | 10 10 0  |
| Canada, 49th and 50th .... do  | 7 10 0   | 10 10 0  |
| Canada, 50th and 51st .... do  | 7 10 0   | 10 10 0  |
| Canada, 51st and 52nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 52nd and 53rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 53rd and 54th .... do  | 7 10 0   | 10 10 0  |
| Canada, 54th and 55th .... do  | 7 10 0   | 10 10 0  |
| Canada, 55th and 56th .... do  | 7 10 0   | 10 10 0  |
| Canada, 56th and 57th .... do  | 7 10 0   | 10 10 0  |
| Canada, 57th and 58th .... do  | 7 10 0   | 10 10 0  |
| Canada, 58th and 59th .... do  | 7 10 0   | 10 10 0  |
| Canada, 59th and 60th .... do  | 7 10 0   | 10 10 0  |
| Canada, 60th and 61st .... do  | 7 10 0   | 10 10 0  |
| Canada, 61st and 62nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 62nd and 63rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 63rd and 64th .... do  | 7 10 0   | 10 10 0  |
| Canada, 64th and 65th .... do  | 7 10 0   | 10 10 0  |
| Canada, 65th and 66th .... do  | 7 10 0   | 10 10 0  |
| Canada, 66th and 67th .... do  | 7 10 0   | 10 10 0  |
| Canada, 67th and 68th .... do  | 7 10 0   | 10 10 0  |
| Canada, 68th and 69th .... do  | 7 10 0   | 10 10 0  |
| Canada, 69th and 70th .... do  | 7 10 0   | 10 10 0  |
| Canada, 70th and 71st .... do  | 7 10 0   | 10 10 0  |
| Canada, 71st and 72nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 72nd and 73rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 73rd and 74th .... do  | 7 10 0   | 10 10 0  |
| Canada, 74th and 75th .... do  | 7 10 0   | 10 10 0  |
| Canada, 75th and 76th .... do  | 7 10 0   | 10 10 0  |
| Canada, 76th and 77th .... do  | 7 10 0   | 10 10 0  |
| Canada, 77th and 78th .... do  | 7 10 0   | 10 10 0  |
| Canada, 78th and 79th .... do  | 7 10 0   | 10 10 0  |
| Canada, 79th and 80th .... do  | 7 10 0   | 10 10 0  |
| Canada, 80th and 81st .... do  | 7 10 0   | 10 10 0  |
| Canada, 81st and 82nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 82nd and 83rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 83rd and 84th .... do  | 7 10 0   | 10 10 0  |
| Canada, 84th and 85th .... do  | 7 10 0   | 10 10 0  |
| Canada, 85th and 86th .... do  | 7 10 0   | 10 10 0  |
| Canada, 86th and 87th .... do  | 7 10 0   | 10 10 0  |
| Canada, 87th and 88th .... do  | 7 10 0   | 10 10 0  |
| Canada, 88th and 89th .... do  | 7 10 0   | 10 10 0  |
| Canada, 89th and 90th .... do  | 7 10 0   | 10 10 0  |
| Canada, 90th and 91st .... do  | 7 10 0   | 10 10 0  |
| Canada, 91st and 92nd .... do  | 7 10 0   | 10 10 0  |
| Canada, 92nd and 93rd .... do  | 7 10 0   | 10 10 0  |
| Canada, 93rd and 94th .... do  | 7 10 0   | 10 10 0  |
| Canada, 94th and 95th .... do  | 7 10 0   | 10 10 0  |
| Canada, 95th and 96th .... do  | 7 10 0   | 10 10 0  |
| Canada, 96th and 97th .... do  | 7 10 0   | 10 10 0  |
| Canada, 97th and 98th .... do  | 7 10 0   | 10 10 0  |
| Canada, 98th and 99th .... do  | 7 10 0   | 10 10 0  |
| Canada, 99th and 100th .... do | 7 10 0   | 10 10 0  |

| METALS.                            | £. s. d.  | £. s. d.  |
|------------------------------------|-----------|-----------|
| Iron—Bar, Welsh, in London .. ton  | 4 17 6    | 6 0 0     |
| " " at works in Wales .. do        | 4 15 0    | 5 0 0     |
| " " Staffordshire, in London .. do | 6 15 0    | 7 0 0     |
| COPPER—                            |           |           |
| British, cake and ingot .. ton     | 79 0 0    | 79 10 0   |
| Best selected .. do                | 79 10 0   | 80 0 0    |
| Sheets, strong .. do               | 83 0 0    | 85 0 0    |
| Chili, bars .. do                  | 77 15 0   | 0 0 0     |
| Yellow Metal .. lb.                | 0 0 7 1/2 | 0 0 7 1/2 |
| LEAD—                              |           |           |
| Pig, Spanish .. ton                | 13 0 0    | 0 0 0     |
| English, common brands .. do       | 13 5 0    | 0 0 0     |
| Sheet, English .. do               | 14 10 0   | 0 0 0     |
| SELENIUM—                          |           |           |
| Silesian, special .. ton           | 18 7 8    | 0 0 0     |
| Ordinary brands .. do              | 18 5 0    | 0 0 0     |
| TIN—                               |           |           |
| Strait .. ton                      | 97 0 0    | 0 0 0     |

| METALS (continued).          | £. s. d. | £. s. d. |
|------------------------------|----------|----------|
| TIN (cont.)—                 |          |          |
| Australian .. ton            | 97 0 0   | 0 0 0    |
| English Ingots .. do         | 100 0 0  | 0 0 0    |
| ZINC—English sheet .. ton    | 21 0 0   | 22 0 0   |
| OILS.                        |          |          |
| Linseed .. ton               | 18 2 6   | 18 7 6   |
| Cocunut, Cochin .. do        | 28 10 0  | 30 0 0   |
| Ceylon .. do                 | 27 5 0   | 0 0 0    |
| Palm, Lagos .. do            | 28 10 0  | 0 0 0    |
| Rapeseed, English pale .. do | 32 0 0   | 0 0 0    |
| " brown .. do                | 30 10 0  | 0 0 0    |
| Cottonseed, refined .. do    | 28 0 0   | 0 0 0    |
| Tallow and Oleine .. do      | 19 0 0   | 46 0 0   |
| Lubricating, U.S. .. do      | 5 0 0    | 6 0 0    |
| " refined .. do              | 7 0 0    | 12 0 0   |
| TAR—Stockholm .. barrel      | 1 2 0    | 1 2 6    |
| Archangel .. do              | 0 13 0   | 0 0 0    |

## COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

### COMPETITION.

| Nature of Work.                       | By whom Required. | Premium.      | Designs to be delivered. | Page. |
|---------------------------------------|-------------------|---------------|--------------------------|-------|
| Alteration to Chapel, Huddersfield .. | The Committee ..  | Not Stated .. | Not stated ..            | xi.   |

### CONTRACTS.

| Nature of Work, or Materials.                    | By whom Required.                      | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|--------------------------------------------------|----------------------------------------|-----------------------------------|--------------------------|-------|
| Paving Works ..                                  | Wandsworth Bd. of Wks ..               | Official ..                       | Jan. 20th ..             | xv.   |
| Drainage and Sewer Work ..                       | do ..                                  | do ..                             | do ..                    | xv.   |
| Waterworks ..                                    | Mansfield U.R.S.A. ..                  | Herbert Walker ..                 | Jan. 30th ..             | xv.   |
| Road Materials ..                                | Bexley Local Board ..                  | E. R. Boulter ..                  | do ..                    | xv.   |
| Alterations and Additions to Workhouse ..        | Hackney Union ..                       | W. Barnett ..                     | do ..                    | xv.   |
| Works and Materials ..                           | Chelsea Vestry ..                      | G. R. Strachan ..                 | Jan. 31st ..             | xv.   |
| Furnace, with Boiler, Engine, and Machinery ..   | Hornsey Local Board ..                 | U. de Courcy Medley ..            | Feb. 4th ..              | xv.   |
| Granite, Kerb, York Paving, & Granite Cubes ..   | Paddington Vestry ..                   | Official ..                       | do ..                    | xi.   |
| Granite for Repairing Roads ..                   | do ..                                  | do ..                             | do ..                    | xi.   |
| New Streets Works ..                             | St. Giles (Gamberwell) ..              | do ..                             | do ..                    | xi.   |
| Storm Water Drains, Main Sewers, &c. ..          | Vestry ..                              | do ..                             | do ..                    | xii.  |
| Galvanised Iron Dust Pails ..                    | Trustees, Rolleston Estate ..          | Maxwell & Tuke ..                 | do ..                    | xiii. |
| Stoneware Pipe Sewers ..                         | Rotherhithe Vestry ..                  | Official ..                       | Feb. 5th ..              | xi.   |
| Cast Iron Water Mains ..                         | Tottenham Local Board ..               | J. E. Worth ..                    | do ..                    | xi.   |
| Laundry Buildings, &c. ..                        | do ..                                  | do ..                             | do ..                    | xi.   |
| New Sewer, &c., College Hill ..                  | Torteth Park Local Bd. ..              | J. Price ..                       | do ..                    | xii.  |
| Horses, Carts, & Royal Parks ..                  | Com. of H.M. Works ..                  | Official ..                       | Feb. 6th ..              | xii.  |
| Concrete Paving ..                               | Gt. Yarmouth U.S.A. ..                 | J. W. Cockrell ..                 | Feb. 7th ..              | ii.   |
| New Lighthouse at Southwold ..                   | Corporation of Trinity House ..        | do ..                             | do ..                    | xv.   |
| Works and Materials ..                           | St. Pancras Vestry ..                  | W. B. Scott ..                    | Feb. 11th ..             | xii.  |
| Hydrants ..                                      | Bournemouth Com. ..                    | G. R. Andrews ..                  | do ..                    | xii.  |
| Dredging Works ..                                | Southampton Harb. Bd. ..               | Official ..                       | do ..                    | xi.   |
| Works, Materials, &c. ..                         | Vestry, St. Mary Abbots, Kensington .. | Official ..                       | Feb. 12th ..             | xi.   |
| Alteration, &c. Entrance Lodge of Cemetery ..    | St. Pancras Burial Bd. ..              | J. T. Lee ..                      | do ..                    | xiii. |
| Drainage Works ..                                | Tadcaster, R.S.A. ..                   | Brundell, Simmons & Co. ..        | Feb. 16th ..             | xii.  |
| Additional Subdividing Tanks, Carriers, &c. ..   | Hanwell Local Board ..                 | E. J. W. Herbert ..               | Feb. 18th ..             | xv.   |
| Pumps and Fittings ..                            | Tottenham Local Bd. ..                 | J. E. Worth ..                    | Feb. 19th ..             | xv.   |
| Works, Repairs, and Supply of Building Mat. ..   | War Department ..                      | Official ..                       | Feb. 21st ..             | xi.   |
| Works and Materials (S. Eastern R.E. Dist.) ..   | do ..                                  | do ..                             | Feb. 27th ..             | xi.   |
| Works and Materials (York R.E. Sub-Dist.) ..     | do ..                                  | do ..                             | do ..                    | xi.   |
| Works and Materials (Brighton R.E. Sub-Dist.) .. | do ..                                  | do ..                             | Mar. 4th ..              | xi.   |
| Works, Repairs, and Supply of Building Mat. ..   | do ..                                  | do ..                             | do ..                    | xi.   |
| Footway Tunnel across and under R. Thames ..     | Met. Board of Works ..                 | do ..                             | Mar. 15th ..             | xi.   |
| Supply of Mats ..                                | School Bd. for London ..               | Official ..                       | Not stated ..            | xi.   |
| Wrought Iron Scraper Gratings, &c. &c. ..        | do ..                                  | do ..                             | do ..                    | xi.   |
| Chemical Cupboards, Tray do, Tablets & Steps ..  | do ..                                  | do ..                             | do ..                    | xi.   |
| Excavating and Sifting Sand and Gravel ..        | W. H. Gibbs & Co. ..                   | do ..                             | do ..                    | xv.   |

### PUBLIC APPOINTMENTS.

| Nature of Appointment.                          | By whom Advertised.    | Salary.                 | Applications to be in. | Page. |
|-------------------------------------------------|------------------------|-------------------------|------------------------|-------|
| Head Mechanical Draughtsman ..                  | Government of India .. | 240 Rupees per month .. | Feb. 4th ..            | xix.  |
| Engineer Students and Students in Naval Com. .. | C. S. Commission ..    | Not stated ..           | March 16th ..          | xix.  |

### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                                                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| ASHTEAD (Survey).—For the erection of two detached houses, on the Grenville Park Estate, for Miss Coates. Mr. Lionel Littlewood, architect, 9, Great James-street, Skilton, Leatherhead (accepted) .. £1,300 0 0                                                                           |  |
| ASHTEAD (Survey).—For the erection of Stables, &c., to "Grenville," for Miss Coates. Mr. Lionel Littlewood, architect, 9, Great James-street, Bedford-row, W.C. Baseman, Ashted .. £298 10 0<br>Skilton, Leatherhead (accepted) .. 237 0 0                                                 |  |
| BRIGHTON.—For heating the new Board Schools, Park-street, Brighton. Mr. Thomas Simpson, architect, Brighton .. John Grundy .. 2295 0 0                                                                                                                                                     |  |
| DATCHET.—For the erection of a bungalow, for Mr. W. C. Searle. Mr. Ed. A. Ram, architect, Gt. Queen-street, Westminster .. £1,097 0 0<br>Hassell, London .. 908 0 0<br>Ford & Kirrage, Upper Holloway, N. .. 820 0 0                                                                       |  |
| DATCHET.—For erecting chalet residence for Mr. F. Baxter. Mr. Thos. W. Willis, architect, 34, Ely-place, Stone & Humphreys, London .. £1,067 0 0<br>Willis, Datchet .. 888 0 0<br>Hallis, Windsor .. 884 0 0<br>Ford & Kirrage, Upper Holloway, N. .. 760 0 0<br>Atkins, Slough .. 730 0 0 |  |
| DATCHET.—For the erection of gardener's cottages, for Mr. F. Baxter .. Ford & Kirrage (accepted) .. £199 0 0<br>(Vinerie, span-roof houses, and walling at schedule of prices).                                                                                                            |  |

EDMONTON.—For erecting a new south aisle and restoring the top of tower stair-turret, and rebuilding parapets of tower (at the parish church, Edmonton, Middlesex, for the Vicar and the Building Committee. Mr. W. Gillies Scott, architect:—

| New South Aisle, &c.              | Restoring Tower Turret, &c. | Total. |
|-----------------------------------|-----------------------------|--------|
| W. R. Gardener, Wal-              |                             |        |
| chan Abbey .. £2,150 ..           | £320 ..                     | £2,470 |
| Cornish & Gayer,                  |                             |        |
| North Walsham .. 1,895 ..         | 215 ..                      | 2,110  |
| J. Wheeler, Wantage .. 1,768 ..   | 285 ..                      | 2,053  |
| J. H. Mallett, Hoxton .. 1,632 .. | 161 ..                      | 1,793  |
| Goddard & Son, Eton .. 1,497 ..   | 220 ..                      | 1,697  |
| S. Parmenter, Brain-              |                             |        |
| tree .. 1,637 ..                  | 144 ..                      | 1,681  |

|                                                                                                                       |        |      |
|-----------------------------------------------------------------------------------------------------------------------|--------|------|
| GUILDFORD.—For public baths for the Guildford Urban Sanitary Authority. Mr. Henry Peck, Borough Surveyor, architect:— |        |      |
| J. Gammon & Son, Petersfield ..                                                                                       | £3,718 | 0 0  |
| Mitchell Bros., Shalford ..                                                                                           | 3,549  | 0 0  |
| Robert Pink, Milford ..                                                                                               | 3,442  | 0 0  |
| P. E. Downes, Guildford ..                                                                                            | 3,345  | 10 0 |
| Robert Smith, Guildford ..                                                                                            | 3,325  | 0 0  |
| J. McWilliam & Son, Bournemouth ..                                                                                    | 3,290  | 0 0  |
| Harvey Brown, Bramley ..                                                                                              | 3,200  | 0 0  |
| Henry Potter, Lower Clapton ..                                                                                        | 3,198  | 0 0  |
| Robt. Wood, Cobham ..                                                                                                 | 3,160  | 0 0  |
| T. H. Kingerlee, Oxford ..                                                                                            | 3,117  | 0 0  |
| Jno. Pillar, Teddington ..                                                                                            | 3,125  | 0 0  |
| Geo. Garnett, Guildford ..                                                                                            | 3,100  | 0 0  |
| Stanley Ellis, Guildford ..                                                                                           | 3,088  | 0 0  |
| Jno. Bottrill & Son, Reading ..                                                                                       | 3,080  | 0 0  |
| Tompsont & Kingham, Farnham ..                                                                                        | 3,050  | 0 0  |
| Peter Peters, Hoxham ..                                                                                               | 2,940  | 0 0  |
| Edgar Seaber, Godalming ..                                                                                            | 2,893  | 0 0  |
| Frank Milton, Witley ..                                                                                               | 2,897  | 0 0  |
| Martin, Wells & Co., Aldershot ..                                                                                     | 2,880  | 0 0  |
| W. Smith & Sons, Guildford ..                                                                                         | 2,878  | 0 0  |
| * Accepted.                                                                                                           |        |      |



LONDON.—For rebuilding the London and South-Western Bank, 180, Whitechapel-road, E. Mr. Edward Gabriel, architect. Quantities by Mr. G. H. Tasker:—  
Howlett ..... £3,920 0 0  
Wood ..... 3,883 0 0  
Holland ..... 3,677 0 0  
Nightingale ..... 3,748 0 0  
Kynoch ..... 3,740 0 0  
Smith & Son ..... 3,569 0 0  
Albertson & Latta ..... 3,493 0 0  
J. O. Richardson ..... 3,407 0 0  
Shepherd (accepted) ..... 3,360 0 0

LONDON.—For new stables, cart-house, and men's quarters, at James-street, Lower Marsh, Lambeth, for Mr. George Vickers. Mr. Alfred Burnell Bursell, architect. Quantities by Mr. H. T. A. Chidgey:—  
Read ..... £1,679 0 0  
Wall ..... 1,578 0 0  
F. & J. Wood ..... 1,677 0 0  
Jerrard ..... 1,607 0 0  
Longman & Way ..... 1,547 0 0  
W. & F. Croaker ..... 1,532 0 0  
Nightingale ..... 1,520 0 0  
Foster (accepted) ..... 1,498 5 2

LONDON.—For rebuilding the "Rope and Anchor" public-house, Acre-lane, Brixton, for Mr. J. Baldwin. Mr. Wm. Eves, architect, 10, Union-court, Old Broad-street, E.C.1:—  
Jackson & Todd (too late) ..... £1,819 0 0  
Godfrey & Son ..... 1,828 0 0  
Sals ..... 1,810 0 0  
Holand ..... 1,800 0 0  
Burman ..... 1,769 0 0  
Holliday & Greenwood ..... 1,749 0 0  
Shepherd ..... 1,740 0 0  
Harris & Wardrop ..... 1,740 0 0  
Downs ..... 1,679 0 0  
Chappell, 149, Lupus-street, S.W.\* ..... 1,665 0 0  
Dabbs (too late) ..... 1,561 0 0  
\* Accepted.

LONDON.—For extending folding store, at 128, Goswell-road, for Messrs. Carter, Paterson, & Co. Limited. Mr. Wm. Eves, architect, 10, Union-court, Old Broad-street, E.C.1:—  
Jackson & Todd ..... £249 0 0  
Harris & Wardrop ..... 820 0 0  
Chessum ..... 800 0 0  
Holland (too late) ..... 798 0 0  
Godfrey & Son ..... 774 0 0  
Dabbs ..... 728 0 0  
Higgs, F. & H. F., Station Works, Loughborough Junction, S.E.\* ..... 725 0 0  
\* Accepted.

LONDON.—For alterations to the Birkbeck Schools, Sumner-road, Camberwell, for the purposes of a Temporary Workhouse, &c., for the Guardians of the Poor of the Parish of Camberwell. Mr. Robt. P. Whellock, architect, 45, Finsbury-pavement, E.C.1:—  
Belman Bros. ..... £1,325 0 0  
H. L. Holloway ..... 1,290 0 0  
H. P. Poonock ..... 1,195 0 0  
Geo. Parker ..... 1,170 0 0  
W. Smith ..... 1,165 0 0  
John Allen & Sons (accepted) ..... 1,137 0 0

LONDON.—For new stables in rear of the "Nag's Head," Hackney-road, for Mr. C. Deakin. Messrs. Saville & Martin, architects, 86 and 87, Strand, W.C. Quantities supplied:—  
Yardley & Sons ..... £730 0 0  
S. T. Harvey ..... 716 0 0  
Oldrey ..... 699 0 0  
Spencer & Co. .... 685 0 0  
Mooch ..... 685 0 0  
Walker ..... 667 0 0  
W. Royle ..... 638 0 0  
Young & Lonsdale ..... 630 0 0  
G. Goodall ..... 592 0 0

LONDON.—For shop-fronts, fittings, and decorations to shops and houses: 3 to 9, Finsbury-street, E.C.1:—  
Ford & Kirrage, Upper Holloway (accepted at per schedule of prices).

LONDON.—For alterations and decorations to "Ye Two Chairmen" public-house, Warwick-street, Charing-cross, for Mr. Collins. Mr. T. Marcus Houghton, 10, John-street, Adelphi, W.C., architect:—  
Drew & Cadman ..... £195 0 0  
Fussey & Lumley ..... 185 0 0  
C. W. Boris & Co. .... 183 0 0  
J. Woodman, 2, Northop-street, Park-street, W. (accepted) ..... 177 10 0

LONDON.—For erecting residential flats and shops, Upper-street, Islington. Mr. E. C. Beaumont, architect, Imperial buildings, Ladgate-street, E.1:—  
J. H. Mollett, Crown Wharf, Pooler-street, Hoxton, N. .... £8,274 0 0

LONDON.—For the erection of new premises on the "Castlowes Freehold Estate," High-street, Camden Town, for Mr. Messrs. Forbes & Son. Mr. Lionel Littlewood, architect, 8, Great James-street, Bedford-row, W.C.1:—  
Geo. R. Rowe, Westminster ..... £1,300 0 0  
\* Accepted.

LONDON.—For heating by warm air St. Paul's Church, Haggerston, E. Mr. A. W. Blomfield, A.R.A., architect:—  
John Grundy ..... £140 0 0

LUTON.—For new stone staircase and other works at Messrs. Beecroft & Sons' premises, George-street and Bute-street, Luton. Mr. W. J. Pearson, architect:—  
Ford ..... £2 0 0  
Pryer ..... 173 0 0  
Neville Bros. .... 165 0 0  
Smart (accepted) ..... 160 0 0

MOTtingham (Kent).—For repairs and decorations at "The Woodlands," Mottingham, for the Trustees of the late Mr. F. A. Schroeter:—  
Gates, Lee ..... £413 7 0  
Lowe, Chislehurst ..... 371 0 0  
Wood, Chislehurst ..... 265 0 0  
Mitchell, Eltham (accepted) ..... 241 7 0

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## TO CORRESPONDENTS.

H. H. B.—H. S. C.—R. M. B.—H. R. L. (we can hardly comment reports of the "smoking concert" of various architectural bodies throughout the kingdom. No doubt they are very enjoyable to members, but the reports of them hardly constitute architectural news. R. C. (your letter is too much of an ex parte statement to us to print. Another of the six competitors has informed us that he had no desire or intention to endeavour to upset the award.)—T. (too late.)—A. W. S. (too late.)—E. (too late this week.)—R. (ditto).

As statements of facts, lists of tenders, &c., must be accompanied by the names and addresses of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses. The co-signatories of queries, articles, and papers read at public meetings, &c., of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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# The Builder.

VOL. LVI. No. 2400.

SATURDAY, FEBRUARY 2, 1889.

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| North Porch, St. Paul's Cathedral.—Drawn by Mr. Amos F. Faulkner .....                     | Double-Page Photo-Litho. |
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### Müntz's History of Renaissance Art.



THE charm and fascination of that extraordinary period in the intellectual history of mankind known as "the Renaissance," have tempted one student after another to try to get at the heart of its mystery, to learn all about its art and literature in the first place, and next, an even more interesting study, to endeavour to realise how the men of that time really thought and felt, and what was the origin and meaning of that effervescence of artistic enthusiasm and inventive power which subordinated every other consideration to the one aim of producing beautiful work, whether in painting, sculpture, or decorative art. The large and profusely illustrated quarto by M. Müntz forms the latest and one of the most important of these critical examinations of the Renaissance. We gather from the title, indeed, as well as from the introductory chapter, that this work, voluminous as it is, forms only a portion of a complete study of the Renaissance, topographically and chronologically, of which the remaining portions are to follow. The present volume is confined to Italy, with the further note that it deals especially with "Les primitifs," the earlier powers of the Renaissance period; but the author especially notes in his introductory chapter that we may divide the Renaissance into two distinct epochs, the early and the later Renaissance (the Germans, who are always for this kind of hair-splitting, want to make out a third intermediate one); a division in which we are quite disposed to concur. The earlier period (the latter part of the fourteenth and the whole of the fifteenth century) is what we should regard as the real "Renaissance," in the true meaning of the word; it was the budding of a new spirit in art derived from the records and traditions of antique art which the revival of learning had just brought into prominence; the later period of the sixteenth and earlier part of the seventeenth century was the development and elaboration

of the new school of art on a line of its own,—the maturity of what is seen in the fifteenth century in its first growth. It is of this earlier period, or the true Renaissance, that M. Müntz speaks in this volume.

Like most French writers, M. Müntz goes most systematically to work. He gives a synopsis of the main argument of his work in an introductory chapter. In Book I. he deals, in successive chapters, with the characteristics and origination of the Renaissance movement in various regions; "The Early Renaissance at Rome," "The Early Renaissance at Naples," &c.; and he dwells a good deal on the influence at this period of the class of men whom he calls "The Mæcenas's," powerful nobles or men of wealth, such as the Medici, the Sforza family, the d'Este family, and others, who were more or less connoisseurs and propagandists of the new school of art, and whose personal influence, though it is difficult to rate or define it precisely now, must, at all events, have been considerable in the movement, more especially as they were mostly among the specially educated people of the day, and the Renaissance was essentially a movement based on education. Book II. treats of the conditions or constituent elements of the early Renaissance, under the heads of "Tradition," "Realism," and "Education and Condition of Artists." It is only after all the outlines of the subject have been thus framed that we come to the consideration in detail of the architecture, sculpture, painting, and decorative art of the early Renaissance, each of which forms the subject of a separate Book,—architecture taking the first place, as the art round which all the others are grouped; a position which M. Müntz does not fail to recognise for it consistently.

Let us endeavour to examine, as far as the limits of our space allow, the special suggestions which arise out of M. Müntz's work in regard to the history and true character of the Renaissance movement. He criticises, in the first instance, such historians as Sismondi pretty sharply, for their indifference to the real interest of this period in Italian history, their remarks on the "want of interest" in the Florentine annals of the time, &c.; as if, says the author, sieges and battles and bloodshed were the only things worth notice by a historian. M. Müntz asks us to imagine a time "à la fois très active et très calme," free from the violent passions of the middle ages: as much as from the profound corruption of the sixteenth century, dis-

turbed by numerous miniature wars, but none of them very sanguinary or destructive; and otherwise employed in work of a humanising tendency. This, we may observe, is much the same view indicated here and there by Browning, who, of all living writers, gives most evidence of having penetrated to the heart of the Italian early Renaissance period (as his exceptional knowledge of early Italian history and literature especially qualified him to do), and throws the most vivid light upon it for modern readers. Thus, in "Luria," he gives exactly the same impression which M. Müntz wishes to convey,—a small State engaged in a little war, which over,—

"The calm studious heads  
Come out again, the penetrating eyes,  
The interrupted scaffold climbs anew,"—

and the serious work of life is resumed. So in the early portion of "Sordello," where the same kind of studious artist life, in the midst of the occasional troubles of the time, is suggested, when there come on the scene

"A Greek or two,  
Straying through Florence streets with studious air,  
Calming the chisel of that Pisan pair,—  
If Nicolo should carve a Christus yet!"

And if we want a sketch of the later Renaissance, the same poet gives it with equal truth and even greater vigour of style in "The Bishop orders his tomb in St. Praxed's Church": but the Bishop lived a century at least later than the time we are now speaking of. M. Müntz is anxious also to remove from the Renaissance period the accusation of vice and cruelty,—at least to urge that these characteristics had no special connexion with the artistic revival in Italy; the evil character of the Italian princes and nobles had been remarkable, he urges, all through the middle ages, and the vices for which the Princes of the Italian Renaissance were conspicuous were found equally rampant in other countries at the same time. This is probably true enough, and it would be absurd to impute to Renaissance art a vicious tendency on the ground of the bad morals of the time. M. Müntz places on the page on which he makes this remark an engraving of a beautiful head of a statue from Florence Cathedral, as an "expression of the religious sentiment of the fifteenth century," and it is a charming comment on his words; but, on the other hand, it must be said that the moral state of society in the Renaissance period puts an entire stop on the argument sometimes carelessly used, that a high standard of artistic taste or genius is favourable to a

\* Histoire de l'Art pendant La Renaissance. Par Eugène Müntz, Conservateur de l'École Nationale des Beaux Arts. I. Italie: Les Primitifs. Paris: Librairie Hachette & Cie., 1889.



high standard of religion and morals. It is very pleasant to think so, but history shows pretty conclusively that art and religion have no necessary connexion. Some of the greatest artists have been very good men, some have been very bad men; neither fact proves anything, one way or the other.

One point which has been rather overlooked in the history of the Renaissance, and to which M. Müntz alludes without attempting to explain it, is the almost entire silence of the records and art of the period as to the peasant; an omission which seems to us significant enough, for there is no doubt that essentially the Renaissance was a movement of the educated classes, although in its earlier period the artisan was the prominent figure,—the artisan, notes M. Müntz, but not the *ouvrier*. Probably, as he suggests, this was the most healthy period for art, when the pseudo-classic literature of the later Renaissance had not come into existence, and when the producers of art were uncontaminated by this artificial atmosphere, knew their Dante, and lived the life of artist craftsmen, seeing and criticising each other's works, as they were executed and made public, by direct reference to the standard of human life around them.

But the prevailing sentiment of the Renaissance, perhaps the prevailing power even, was that love of glory and display, "le culte des jouissances d'esprit et de belles formes," which was a reaction from the ascetic principle of the Middle Ages. The passion of the Renaissance was for the glorification, not for the mortification of man; and, probably, as our author suggests, a powerful stimulus to ambition was given by the contemplation of the work of the artists of the Classic period; the idea that any man's work could thus survive for ages as a model to generations far off, was a powerful stimulus to the modern artists to go and do likewise; and the desire to have one's memory perpetuated led also to the multiplication of monumental statues of those who thought they had a claim on posterity, or wished to pretend to one. The Renaissance was the proclamation of the Pagan pride of human passion and intellect, as opposed to the Christian doctrine of humility and meekness; and in this sense, if in no other, it might well be called an un-Christian epoch. Another, and the last, point summed up in M. Müntz's preface is that it is a mistake to assume that the Renaissance proceeded only from the revival and study of antiquity. His view is that while antique art and literature gave the dominant note of the Renaissance, the study of nature and contemporary life went hand in hand with it, a view which he says he has been the first to proclaim. We should imagine the antique was the predominating influence, but there is much in favour of M. Müntz's view to a certain point. He further illustrates his position by the remark, Suppose there had been by chance in Scandinavia a king who had the idea of reviving Roman antiquity,—would not the idea have been utterly sterile? In Italy there was a congenial intellectual soil for it. But it must be remembered also that Italy had on her material soil the actual remains of Roman architecture, which was not the case with Scandinavia.

In regard to "the Mæcenas's" whose influence is considered in the First Book, M. Müntz is probably not wrong in judging that they had more real influence on the course of art than would be the case with individuals in most periods. As before remarked, the Renaissance was a gospel of culture, and many of the patrons were themselves persons of learning and artistic perception, capable of giving a reason for the course of the treatment they recommended. As to the Medici, M. Müntz is eloquent; he considers that any researches into the history of their time will only result in more than confirming the popularly accepted view as to their liberality, their keen æsthetic perception, and the real influence they had on the art of their time. As to the action of the Papal influence on art, the author suggests that the Popes, without any special or preconceived theory on

the subject, exercised really a very favourable influence on art in turning it to the service of the Church, in that they thereby kept it in relation with some of the fundamental ideas of the society of the time. We should hardly put it that way. They gave the artists a number of ideal and suggestive subjects, no doubt, with more meaning in them, for the spectators of the period, than could have been found in Pagan mythology, to which the artists would otherwise have instinctively turned; but we should doubt whether these subjects came home more to the tastes and feelings of society in general at that period than the mythological legends. The manner in which they were treated does not lead to that conclusion. The Popes, with all their influence from the conjunction of spiritual and temporal power, never were able to keep a circle of great artists immediately round them, or make Rome an important artistic centre. They had to appeal to Florence when they wanted their best work done.

We must refer the reader to M. Müntz's volume to follow out the view presented of the special characteristics of the Early Renaissance at Naples, in Lombardy, and in other localities, only glancing at the strange spectacle presented by the Malatesta Temple at Rimini, the interior of which is the subject of a separate plate, presenting one of the most singular combinations of the pointed arch with details adapted from Classical architecture, piers formed of a series of mouldings, and panels between them, one over the other, alternating with purely Classical fluted pilasters, the whole suggesting the *plateresque* of Spain rather than what we usually connect with the idea of the Italian Renaissance. The subjects of the decoration are the sciences, the arts, the planets, the signs of the Zodiac; "les emblèmes sacres sont remplacés par une ornementation bizarre, exotique, fantastique: là où l'on sculpte d'ordinaire des chérubins se développent des éléphants, emblèmes de Malatesta, les chiffres entrelacés du fondateur et de sa maîtresse, des fleurs de lotus." Alberti, whom M. Müntz calls "the Rienzi of fifteenth-century art," and who was the artistic ally, or *protégé*, whichever way we put it, of Sigismund Malatesta, can hardly have been satisfied with this kind of compromise of Gothic profusion with Classic detail; his aim was simply, as the author puts it, to blot out with one stroke of the pen the whole of Mediæval and Christian architecture, and to return purely and simply to the practice of art under the Roman Empire—a project to which, cold and conventional as it seems to us now, he evidently brought the genuine enthusiasm of an ardent believer. He represented the worship of the antique in its most unadulterated form; while the form taken by Renaissance art in Venice represented the opposite phase, the combination of Classic forms with a large mixture of Gothic and Oriental feeling; the position and traditions of Venice, in fact, holding her back from participation in the Renaissance movement later than any other important city of Italy.

In attempting, in his "Livre II," to define the part played by tradition, by realism, and by education, in the formation of ideas and feelings of the Renaissance epoch, M. Müntz admits at the outset that there is much about that epoch which is and must remain inexplicable.

"Cette recherche de la clarté, de la légèreté, de l'élégance, cette vision des 'grands corps nobles qui vivent noblement et font deviner une humanité plus fière, plus forte, plus sereine, plus agissante, bref, moins réussie que la nôtre.'—A puis le gracieux prétexte à la force, la distinction à la grandeur, l'idéal de Donatello, en un mot, triomphant là où triomphera plus tard celui de Michel-Ange; la jeunesse dans les idées, la pureté dans les formes; voilà des problèmes de psychologie que l'on essaierait en vain de faire tenir dans une forme philosophique ou historique!"

What the author first undertakes to do in this portion of the book is to fix the actual part which tradition played in the movement.

The spirit of Christian iconoclasm had, I doubt, done much to create a gulf between the antique past and the middle ages, but M. Müntz notes, and rightly, that the sentiment of the Renaissance of the antique was obviously present in the mind of Charlemagne, more especially so in the institution of the "Palatine" guild or club for the cultivation of letters, of which there is traditionary evidence,\* but to which M. Müntz makes no reference. M. Müntz also remarks on the exceedingly Roman style and appearance of the coins issued by Charlemagne, Louis, Debonnaire, Conrad I., and other sovereigns long before the Renaissance. The movement of Charlemagne, however, seems to have died when there was no longer his intellectual superiority and strong will to push it forward. Across the most ignorant tracts of the middle ages, curiously enough, the names of some of the great classic poets and artists were in some sort preserved under a vague tradition that they were powerful personages of some kind. Virgil was a powerful sorcerer, who might "strike" the cattle or injure the flocks. Phidias and Praxiteles were ancient magicians. There lingered, at all events, the names and the popular persuasion of the greatness of some kind attaching to them, and this would not be without its influence in disposing people to accept the new discovery of the artistic and poetic greatness which these names represented. More directly to the purpose of the artistic study of the Renaissance are the evidences, which many are cited by M. Müntz, of occasional antique influences showing themselves even during the distinctly Mediæval period of Italian art. The presence of the remains of Classic architecture and sculpture on the soil of Italy made itself felt every now and then in a way that showed it was not entirely out of sight or out of mind. The whole character of Italian Mediæval architecture seems to have been unconsciously influenced in this manner. The buildings of the Mediæval period always retained a certain refinement of detail, a regard for symmetry, certain reserve of design, quite distinct from the forms taken by Gothic architecture in northern countries where no Classic remains existed. The detail would, of course, be in part influenced by climate, but the general half-Classical ordonnance of the buildings is no doubt due, though unconsciously, to the presence on the soil of those mute witnesses of the past greatness of Classical architecture. We find, too, in the midst of the Mediæval period, direct suggestions of Classical architecture in the works of painters. We find Giovanni di Pisa carve a rude replica of the Venus de Medici on a chair in Pisa Cathedral. A curious little point is mentioned by M. Müntz in regard to a painting in the Church of the "Incoronata" at Naples, where, in a painting of a scene representing the sacrament of marriage, there are some naked winged genii, *putti*, as the Italians call them. These are white pictures, indicating that in the eyes of the painter they were regarded as statues.

Thus we see the memory of antique art kept up in a desultory manner even during the Mediæval period, and to some extent, in fabulous and fantastic manner, forming even a portion of popular faith. There was a kind of innate tendency towards a revival of antique art only waiting for the occasion and suggestion for it. The Renaissance was in this sense, thinks our author, the revenge of the Southern mind for its long bondage under Northern races and ideas. But the movement of revival, though there may have been something in the popular mind which was prepared for it, was essentially, as M. Müntz is careful to note, an aristocratic, and not a popular movement; it proceeded from the learned, and they were the rich and noble families, for it was those only who had the time, means, and opportunity to unearth and study the remnants of Classic literature.

\* See Browning's "Sordello" for some indications as to the intellectual part played by Charlemagne in the Europe of his day.



id art.\* It brought back that serenity which is characteristic both of Classic life and of classic art, and which is seldom the characteristic of the popular party in any time or country. It is true that the admiration for classic art was,—in the early Renaissance, at least,—entirely unchecked by any critical judgment; the remains of all buildings were indiscriminately liable to be admired and reproduced, whether of the best period of art or of the decadence; and Greek architecture was the architects of the fifteenth century's ideal book. As M. Müntz observes, they ignored not only Athens, but the remains in their own soil at Pæstum, Segeste, and Alimonte, a circumstance which is very curious when one fully considers it. It may partly be explained, perhaps, by the fact that the sites of these early Doric remains were out of the beat of observation, in those days of bad roads and disturbed and dangerous travelling; but it is strange, nevertheless, that at a time when there was a perfect passion for every relic of classical antiquity their remains could have been passed over entirely; and we cannot help seeing in this an indication of a distinction and opposition between the Greek and the Roman spirit in art, reappearing again at the Renaissance. The remains at Pæstum, in spite of their situation in Italian soil, had really nothing in common with the Italian spirit, which went naturally back to the remains of Roman architecture, passing over with indifference to the purer and severer Greek school. We do not quite agree with M. Müntz in thinking that it was just as well so. It is true that the genius of Roman architecture is essentially more suited to modern Italy; the Renaissance architects developed new sentiment and new ideas on the basis of the Roman remains, and they might have done the same with the Greek remains if they had taken notice of them; the study of the severer Greek detail could, at all events, have been without its effects on the training of Renaissance artists. Still less can we agree with M. Müntz in regretting that the study of Roman architecture led the Renaissance architects to a naturalistic to a more severe and abstract form of decoration. It is true that Renaissance decorators pinned themselves too close to Roman forms, and that they, in carrying on the study from nature, have obtained a much greater variety of effects, which could have been treated in an abstract manner; but as to regretting their departure from the type of naturalistic ornament,—shown, for instance, in the borders of Della Robbia artists, with their bundles of coloured fruits and leaves (of one of which an engraving is given, as if to claim our sympathy),—we can only say that we do not care much stuff as that as ornament at all, we think the Italian artists were well served from it by the higher and more intellectual decorative taste set up at the Renaissance.

The influence of realism, or study direct from nature, in Renaissance art, has received much less attention than that of tradition. We are accustomed to think of Renaissance painting and sculpture as belonging to a school opposed to realism, an idea suggested and fostered by its close connexion with antique art. There is evidence, however, of study from nature in early Renaissance art, and in the attempts, never quite correct but in highly spirited and expressive, to draw the nude figure, and in the various representations of animals which, from time to time, occur in the painting and sculpture of the period. M. Müntz remarks that the horse and lion seem to have been the great difficulties; in regard to the horse he observes: "no machine is more difficult to construct and put in motion than that noble and ardent creature." A bas-relief by Andrea Pisano, showing one of the illustrations to this portion

of the book, shows, however, a creditable attempt to represent a man on a galloping horse, treated in a manner which has little affinity with the classic spirit. The main difficulty in regard to the lion seems to have been his countenance, which, up to a late period, preserves the human expression which the earlier painters seemed unable to escape from. The almost unrecognisable licence with which contemporary buildings are portrayed in the pictures of the time (of which some amusing examples are given), is still more curious; the difficulty of portraying them correctly seems really to have been as great in that day as that of correctly drawing animals. A view of the Coliseum from the "Livre d'heures" of the Duc de Berry, of which a copy is given, is a typical instance; it shows a circular four-storied building, the ground story nearly as high as all the others together, and each story setting back a stage within the lower one, like a telescope, or like the representations of the Tower of Babel in old-fashioned Bible pictures.

In spite of this, we have the fact that linear perspective is an invention of the Italian Renaissance, and that the same epoch left on record its attempts to fix a standard of proportion of the human figure. The theory and aims of art seem to have been continually, during the fifteenth century, in advance of its practice and capabilities; it was always striving after an ideal beyond its achievement: the true and typical state of an age of artistic progress.

We must pass over with a word the chapter on education, merely noting three points in the author's view of the subject. There was no system of art instruction; the State, if it stepped in, encouraged the individual artist, not the study of art in general. The future artist was apprenticed at a very early age, learning almost as a child to be familiar with every portion of the work of an artist and the management of the tools and materials. The life of every artist might be divided into three distinct stages: apprenticeship, companionship, and masterdom. With this note in passing, let us see what our author has to suggest in regard to the architecture of the Renaissance, which forms the subject of "Livre III." This art shows, he considers, less of originality and power than any other art during the Renaissance period, yet with a finish and refinement in its details and treatment which almost disarms criticism. The special note of fifteenth-century work is the contention between the picturesque and the classic elements, in which, however, the latter certainly triumphed in the end, not altogether to the advantage of architecture. The effort after refinement, correctness, purity of line, and above all the "divine symmetry," which in the "Songe de Polyphile" is repeatedly spoken of as the great object in the building of the palace, had its great merits, no doubt,—it led to the application of thought and discrimination to architectural design, to a grace and completeness which M. Müntz elsewhere compares to the music of Mozart and Haydn, but at the cost of coldness and want of accent and contrast. This course was the result not only of the influence of the antique, but of the recoil from Gothic, the acceptance of which, as M. Müntz observes, had been with the Italians "rather a marriage of reason than of inclination," and the true characteristics of Gothic had suffered no little perversion in order to accommodate them to the inherent predilections of Italian taste, which, no doubt, found a far more congenial task in the study of antique classic elements.

M. Müntz's sketch of what he conceives to have been the rôle and position of the architect in the fifteenth century is too long for us to follow here, but should be read with interest by architectural readers. We may note that M. Müntz conceives that then, as in the present day, the architect who made the design usually directed its execution; though sometimes he sent a design from a distance, which was carried out by subordinate workers on the spot, which is suggested as the reason

why in some cases there is no mention of any one occupying the position of architect in the accounts of the works, the real designer having been recompensed otherwise than by payment of money under the regular building accounts. According to the author, the "invariable" usage, in the fifteenth and sixteenth centuries, was that a model of the building to a considerable scale should be prepared before any work was commenced, and it is interesting to see this Italian habit, after so long a period, still asserting itself in connexion with the present great competition at Milan, where a condition is that the successful competitor should produce a model of his design to (in this case) a formidably large scale. In the case of works of the highest importance, this habit of modelling first is highly to be commended; it may often open the eyes of the designer and his friends (or critics) to points in the design which might be amended, in a way which only execution in a model would show, and on this head the fifteenth-century men left us an example well worth attention.

Among other special points remarked by the author in regard to architecture is the predominance of rusticated work in Renaissance buildings, a habit which has also drawn forth the wrath and contempt of Mr. Ruskin. M. Müntz, without taking the same contemptuous criticism, suggests that the Renaissance architects fell into a mistake in imagining that the employment, in such Roman remains as the amphitheatres of Verona and Pola, of incompletely worked stones, was "voulu et raisonné," while, in fact, it was a chance incident in structures which had never been properly finished. The author quotes Burckhardt in support of this opinion, which, nevertheless, we should be somewhat doubtful about accepting. M. Müntz, however, does not deny that this method adds one more element to architectural expression. It is curious to see the extent to which this source of effect has been taken up and applied in a new and very picturesque manner by some of the most original and able among the recent American architects.

Italian architecture, Mr. Müntz sums up, as manifested in the creations of the great men of the early Florentine period, and especially in its great precursor Brunelleschi, has for its dominant quality an invincible striving after simplicity and clearness, developed, perhaps, in part by the study of mathematics, and conveying the idea that there was a desire to render architecture more or less a branch of geometry. The triumph of the early Renaissance architecture is in its ornamentation, "domaine sans bornes, ou sa grace, sa tendresse, débordent sans s'épuiser, l'ornementation tour à tour si pure, si chaste, ou si exubérante et si touffue, ces mille motifs charmants, cherchés et trouvés plus encore que copiés, qui résistent tous les sentiments de celle époque si attachante, respirent son parfum, vivent de sa vie."

The second chapter of the book on architecture contains a great deal of information and criticism upon individual architects of the period and their works. On these and on the long and finely-illustrated chapters on sculptors and painters we cannot say more now. Those who would value a comprehensive historical and critical treatise on this century of Italian Renaissance art will find it worth while to pay attention to Mr. Müntz's book, which is a monumental work of its kind, ably and thoughtfully written, and which would have a distinct value, even apart from its literary and critical merits, for the sake of the immense number of finely-executed plates and cuts with which its abounds, many of them representing things of which we believe there are no other published illustrations, and which in themselves form a tolerably comprehensive résumé of the main characteristics of the period of art which is thus illustrated.

Mr. George D. Oliver, architect, Carlisle, has been elected a member of the Carlisle School Board.

\*This is, in fact, one of the reasons given by Ruskin for the backward and over-acted abuse of the Renaissance; that as not a poor man's art (as, of course, it was not); as a poor had a kind of inherent right to art before any other class!



## QUANTITY SURVEYORS ON THEMSELVES.



PORTENTOUSLY long paper read by Mr. Josiah Hunt to the Surveyors' Institution on Monday night, furnishes a characteristic "confession of faith" on the part of a Quantity Surveyor as to the position which he and his compeers claim to occupy.

It is needless to say that the highest moral ground is claimed for the Quantity Surveyor. "He should do that which is right"; a maxim which is generally supposed to be applicable to some other professions and classes besides quantity surveyors. He is also to do a good deal of the architect's business for him:—

"Of architecture and the laws of architectural design he cannot know too much. It is essential that he should have a sound practical knowledge of building and building construction. He should be well acquainted with building materials, and their specialties in the district in which he is working. He should be a fair draughtsman, so as to be able to reduce into lines upon paper the objects he wishes to set forth; in other words, he should be able to make proper working drawings; and specially he should have acquired the art of 'reading' drawings accurately, so as to see clearly what the architect intended by the lines upon the drawing, and by applying this knowledge he be able to detect discrepancies or differences in different drawings of the same building, such as any want of agreement in plans, sections and elevations; and by this also he should be able to discover anything imperfect in the design which would prevent its being effectually carried out, so that he may not measure walls on an upper story without those walls having something to support them; and so that he may see that the staircases are so designed that they can be constructed with sufficient headway and 'get up' in the space allowed for them on the plan."

We had been under the impression that all this was the architect's business; how many architects there are who are so careless about their own work as to leave such things to be set right by a quantity surveyor we cannot say; but those who do so are ill friends to the profession, and are putting it in a very undignified position.

The first "general" maxim that governs Mr. Hunt's paper is that all quantities are prepared for the benefit of the building-owner. "Quantities are prepared to enable the building-owner to obtain estimates for the building which he proposes to erect, which estimates he could not obtain from competent builders without such quantities, so that he may buy in the cheapest market, or obtain the work he requires for the least money." As a matter of fact, every builder could take out his quantities himself, and in so doing would gain an acquaintance with the work he has to carry out, which under the present competition system he seldom has. Mr. Hunt attacks Lord Coleridge and the *Builder* for having maintained that the quantities are really the business of the contractor. Lord Coleridge in his summing-up in the recent case of Schofield v. Barnardo told the jury "as a rule he ventured to state with confidence that it was the part of the builder, for whose convenience it was done, to pay the quantity surveyor." Mr. Hunt then quotes our own words as follows:—

"We have always maintained, in spite of the prominence into which of late years this bogey of quantities has been brought, that the quantities are in reality the business of the contractor, and of him alone. The building-owner wants a building according to his ideas and the plans which he has approved, and wishes to know the cost beforehand, but how many cubic feet of this or that material go to it is nothing to him. The architect wants his designs properly carried out, the exact quantity of material it includes is nothing to him either, he makes his designs independent of any such consideration. To the contractor alone it is of consequence to know the precise amount of material required, because he has to calculate the cost so as to leave himself a profit."

Mr. Hunt says: "The answer to all this is that the quantities are only means to an end, that end being that the building-owner may obtain the work he requires for the least money, and for this end, and for this end only, are the bill of quantities prepared." Of course no one requires to be told that the end of taking out quantities is to enable the work to

be done (if it is to be done upon estimate) without waste of money and material. But the engagement of the quantity surveyor, as a special agent, to take them out, is simply the result of the modern system of competition estimating, which is so far from being a necessary concomitant of architectural work, that it is, in fact, one of the very vanes of the art of architecture; and so much is this recognised by the few architects who are artists at heart, that they are more and more endeavouring to avoid competition contracts, and to give their work to men they know and in whom they have confidence that they will get good work at a fair price. And even if it were not so, the quantity surveyor is not a necessity in the order of things. Any convenient and cheap method of multiplying drawings and specifications, and placing copies in the hands of each estimator, would answer the same purpose, and get rid of the quantity surveyor for good, provided architects drew up their plans and specifications with the accuracy and care which they always ought to bestow on them, but which some members of the profession seem now content to allow the quantity surveyor to do for them, to the detriment of their own position and that of the profession.

It is in consequence of this absurd ignoring of the real and original position of the quantity surveyor that we have all the fuss and disputing about who is to pay him. This question occupies a great portion of Mr. Hunt's paper, and need not occupy two words if the saddle were once put on the right horse. Mr. Hunt has the assurance to assert that we "taught the doctrine" that the obligation to pay for the quantities passes over, after the signing of the contract, from the building-owner to the builder. We simply quoted the doctrine as the existing belief and practice, and stigmatised it as inconvenient and illogical. This is the kind of quagmire into which the present idea of double responsibility leads Mr. Hunt:—

"As I do not see that at any time there is a contract, express or implied, between the surveyor and the builder, and as from the notice as to payment given to the builders tendering any such contract could not arise (so far as I can see) until the builder had received from the employer a payment under his contract, I think that if the builder, after receiving such payment, is liable to pay the surveyor, it must be for money had and received on his behalf, and not under any contract. But the surveyor has not waived his right to payment by the employer because the employer thinks fit to pay him through the builder instead of paying him direct. There may be cases in which the surveyor might strongly object to waive the right he had against the employer. Suppose the employer to be a wealthy man, and a builder is chosen by the employer whom the surveyor believes to be insolvent,—is the surveyor, against his will, to forfeit his claim against a wealthy employer to substitute a claim against an insolvent builder?"

Apparently, according to Mr. Hunt's lucid notions, the surveyor is to keep himself open to establish a claim against whichever party he thinks will be best able to pay him. Mr. Hunt's sneer at our remark about an arbitrator "not having his hands tied by the law, as a judge has," only shows his own want of perception. A judge sits to administer the law, whatever it may be; an arbitrator sits to administer justice,—a distinction Mr. Hunt, apparently, like some other persons, cannot understand.

The latter part of Mr. Hunt's paper is occupied by a dissertation on the case of Priestley & Gurney v. Stone, accompanied by diatribes against the *Builder* in regard to an article which appeared in this journal, not on that case, as Mr. Hunt (who apparently cannot understand plain English) vainly supposes, but in regard to certain theories as to quantities which were implied in the judgment delivered on the occasion. The whole of Mr. Hunt's references to our article, which are made in that peculiarly swaggering style

"We observe that Mr. Hunt keeps referring to what 'the editor' says. How does he know the article is by the editor? One thing he does not know, that it is a piece of impudence publicly to refer an article in an anonymous journal to some individual whom he chooses to suppose is the author; and we will trouble Mr. Hunt, in any such future reference, to say make, to follow the accepted rule, and refer to *The Builder*, and not to imaginary individuals."

which appears to be becoming more and more characteristic of the typical quantity surveyor, are a series of misrepresentations,—whether wilful, or arising out of pure dulness of apprehension, we, of course, cannot say. The main point of our remarks was that if Judge who decided the case, through not understanding clearly what was the meaning and use of a bill of quantities, erroneously and illogically compared it with cases involving the mere expression of professional opinion, and said that the quantities amounted to such an expression of opinion that they were correct. We showed that this was comparing two classes of statements that were radically different: that a bill of quantities was of the same nature as the statement that two and two make four; that the one were right or they were wrong, and their correctness or incorrectness could definitely be tested, and that a quantity surveyor, putting forth a bill of quantities, ought to put them forth as correct, and ought to be responsible for them if incorrect, and the incorrect quantities were not "quantities" at all, the very *raison d'être* of which is accuracy. We are not surprised that this morality is high for Mr. Hunt, who says that the attainment of the surveyor's signature does not carry with it any warranty, though "it may be useful to the outer world as telling them where they may obtain any further necessary information as to the contents of the bills" (a remark which we prefer to leave without any comment. A little farther on, he says:—

"If a builder to whom bills of quantities have been issued by a surveyor, on behalf of a building owner, goes to the surveyor and asks him, 'I guarantee these quantities?' what would I answer him? As I think of such a kind as shall I in any way mislead the builder, but should open his eyes to the real position. Thus the answer would be, 'Certainly I guarantee them to my employer, and I believe the quantities to be correct, but if you wish for a guarantee from my employer you must apply to him through his architect.' As I am not heroic, I do not say that a surveyor should, under present circumstances, assume upon himself a liability which does not follow from the nature of his employment."

That is to say, the quantities may be guaranteed to the employer, but not to the unfortunate builder, who is to base his estimate on them, cut as close as he can afford. Mr. Hunt's ideas on this point may be better elucidated by the following further quotation:—

"When the builder has finished his work he finds that he has had to supply and pay for a great deal more,—say, than he found in the bills of quantities. He is in a worse position than is expected to be by the amount of the difference in value between the slating for which he has had to pay and the slating for which he gets paid. He has done fifty squares of slating, and he gets paid as per bills of quantities, for forty squares. He has done a lower ten squares of slating. Strictly, I believe that he is. He has no claim against the building-owner, for he has undertaken to carry out the building according to the plans and specification, and these ten squares of slating are necessary to complete the building as shown and described. Of course, the architect is not liable to pay him. Is the surveyor liable to pay him? If my view is right as to cases under Class III, he is not liable. The builder was not liable to pay him for the quantities. There was no privity of contract, no deed, how then can the surveyor be legally liable? If there had been fifty squares required, and fifty squares in the bills of quantities, would he be liable to the surveyor the value of the excessive ten squares?"

Unfortunately for this reasoning, the builder is out of pocket by the transaction, while the surveyor is not.

The long and short of it is that, historically and as a fact, the quantity surveyor is an institution arising out of and only rendered necessary by the system of competition tendering and the hurry of modern building owners to get a result in the shortest and cheapest way possible. Quantities are essentially nothing to do with architecture whatever, though we can hardly expect to carry that conviction home to people who think the great aim of life is "to buy in the cheapest market." That kind of aim I never produced great architecture, and never will. Architecture is a matter of design, and on the part of the architect, of construction



ing on the part of the builder. Both of them are essential to the production of a work of architecture. Quantity surveying is entirely unessential to that end. It was the builder's own work originally (not essential even then, since the contract system is not essential, and is even in some respects mischievous), and the quantity surveyor merely sees once, where a number of builders are to underbid each other for work, what otherwise each of them would and could do separately in time allowed. He was originally and essentially the servant of the builder. He now wants to pose as the master of the architect.

## NOTES.

**W**E print in another column a communication as to the Inhabited House Duty, from which it will be seen that a motion in regard to it will be brought forward in the coming session in the House of Commons. Any tax which tends to make house-room dearer for the poorer classes should be carefully scrutinised. At the same time, the inhabited House Duty has some distinct merits as a tax, for it is one which touches all classes of the community, and its incidence is graduated according to the circumstances of the tax-payer. We have heard, indeed, that large mansions are not rated at as high a figure as they should be, but if this is the case, it is an argument not against this tax in principle, but against the manner in which it is levied. But a discussion in the House of Commons is certainly advisable, if only that the public may have all the arguments for and against the continuance of this tax properly marshalled before it.

**O**VERWORKED railway employés are always sympathised with, the practice of working these useful and responsible public servants for many consecutive hours being condemned by many who would hardly give passing thought to equal injustice in other branches of industry. This arises, no doubt, from the sense of peril and insecurity created by such practices, which swells the ranks of the sympathisers by the addition of many who may more regard to matters of policy than of justice. Hence the sympathy,—partially genuine and disinterested, and partially otherwise,—is very wide-spread. The question was brought before the Great Eastern shareholders in a rather ill-advised manner at their meeting last Tuesday. Mr. Harford, the Secretary of the Amalgamated Society of Railway Servants, had addressed a letter to the *Times*, complaining of the way in which the Great Eastern Company's employés were overworked, with the avowed object of bringing the matter up for discussion at the half-yearly meeting. Mr. Harford drew his examples from the best possible source, viz., Parliamentary returns,—but, unfortunately, singled out two particular months in which it was extremely difficult for the Company to carry on their business without either some of their employés working a considerable amount of overtime, or inexperienced hands being impressed into the service to assist. The months so brought under notice were July, 1886, and January, 1887. During the first of these months the Royal Agricultural Society held its annual meeting at Norwich,—the first time (or, at least, the first for many years) that this important meeting had been held in the Eastern Counties. Few besides railway officials have the least idea of the immense amount of work involved in the railway arrangements for a "Royal Show," and to carry them out satisfactorily,—as the Great Eastern certainly did in 1886,—everybody concerned has to work at high pressure. The other month mentioned was January in the following year. It may be remembered that in January, 1888, we had occasion to remark that during five days of fog the London and North-Western Company had 3,700 men out acting as special fog-signallmen; and the Chairman of the Great

Eastern meeting remarked that in January, 1887, they had eleven days of dense fog to contend with, and that to this fact a large proportion of unavoidable overtime was due. Other speakers pointed out that, although the other railway companies had the same experience, none of them had offended to the same extent in this respect, and the chairman promised that they would not have overtime if they could possibly help it. If the ventilation of this question results in reducing the overtime on this line, some good will have been effected; but it was hardly wise to single out these periods of exceptional difficulty as cases in point.

**T**HE Report of the Works Committee of the School Board for London, to be presented at the meeting of the Board on Thursday, just as we were going to press, contains a number of paragraphs recommending acceptance of tenders for building work, subject not only to the usual conditions, but to the newly-imposed requirement "that he [the contractor whose tender is recommended for acceptance] shall sign a declaration in the contract stating that he pays to the workmen employed by him not less than the minimum standard rate of wages in each branch of his trade." The imposition of this condition is the result of pledges given by present members of the Board when standing for election in November last. We believe that a majority of the members of the London County Council are pledged to the enforcement of a similar condition in all contracts for works carried out by that body.

**T**HE Rector of Croylond, in the course of a letter to the *Times* of Friday last week, asking for further assistance towards the Croylond Abbey Preservation Fund, gives some information, which we presume we may take as reliable, in regard to the state of the foundations of a portion of the Abbey, of early twelfth-century date, which forms an interesting counterpart to the discoveries that were made a few years ago at Peterborough in regard to the light-hearted manner in which foundations were made and walls were built by some at least of the mediæval architects. Mr. Le Bouf says:—

"The first course was laid at a depth of only 4 ft. 7 in., and consisted of small Helpstone stones, laid on edge; height of course, 1 ft. 2 in. Then a layer of light stone quarry dust for 9 in., on which another course of small Helpstone stones, 9 in. in height, laid on their bed. This is covered by another layer of light stone quarry dust to the height of 1 ft., on which a course of 11 in. Helpstone stone was laid.

It is most surprising that the building has held together so long, as the foundations are not only very decayed, but having been laid on so precarious a soil have at last yielded. The tower is not solid work, but simply encases other previous towers, to which this outer shell is not bonded. A mason recently placed his plumb-rule up between those walls.

Movements 25 ft. long by  $\frac{1}{2}$  in. in width have appeared during the last fifteen days, therefore prompt action is absolutely necessary.

I wish it to be distinctly understood that I do not attempt to restore the Abbey, but simply to make it safe as a place of worship."

**S**TUDENTS of Greek Ceramics have long looked eagerly for the publication of the "Chachrylion" Cylix, with the labours of Theseus found at Orvieto and known to have been bought by the Museo Greco-Etrusco at Florence. It is published at last in the number of the "Museo Italiano di Antichità Classica," which has just appeared (Vol. III, Punt. I.) with a long and able commentary by the Director of the Florence Museum, Professor L. A. Milani. The cup is of special interest, not only because it is undoubtedly the earliest of the signed vases with the labours of Theseus, and thus of the utmost importance in the study of typology, but also for the wider reason that all the objects found with it in the Orvieto tomb were carefully preserved and are exhibited together in the Museum. From an examination of these objects Professor Milani dates the cylix of Chachrylion (we must abandon the current

but erroneous form Cachrylion) as immediately after the Persian War. With this signed cylix Professor Milani publishes a number of other vases relating to Theseus, noticeably a cylix in the style of Brygos, and a wooden bowl that has every appearance of coming from the hand of Euthymides. He gives also a valuable tabular view of the mythology of Theseus. Six of the vases here mentioned are from the British Museum,—three of these, we may note, unpublished.

**A** REPORT has been made by Dr. Parsons to the Local Government Board on the sanitary condition of the Holme-Cultram Urban Sanitary District, Cumberland. The town of Silloth was founded about thirty years ago under Act of Parliament by the Silloth Bay Railway Company, being laid out in wide streets at right angles, and properly sewered, with discharge into the sea with sufficient fall to enable sewage to escape at all states of the tide. The house-drains are stated to be of socket-pipes with cemented joints, but not laid under proper supervision, and in some cases with sink and bath wastes connected directly with the drains. The interesting point in the report, however, is in regard to the water, which analysis showed to be much contaminated, without sufficient cause for this being readily apparent. Dr. Parsons says:—

"It is rather difficult to understand how so copious a volume of underground water can have become so generally polluted as these analyses indicate. Silloth is not like an old town of which the site is honeycombed with cesspools and old, leaky drains, but from the first the bulk of the excremental refuse has been conveyed away by efficient sewers. It is considered also that there cannot be any extensive leakages from the sewers into the subsoil, for it is said that if a sewer gets broken, the loose sand runs into it as in an hour-glass, and the position of the leak is indicated on the surface by a conical depression. The porous nature of the ground, however, together with the absence in some place of proper paving of yards, and want of due attention to surface cleanliness, would favour the percolation of surface impurities into the underground water. Another difficulty is the fact that, according to the analysts' reports, samples of water from wells in outlying situations have shown evidence of contamination, one of the worst being from the well at an institution nearly half a mile from the town among the sandhills on the coast. At this institution the drains were being reconstructed at the time of my visit, and a new well was about to be sunk."

The further report as to the housing of the population in adjoining places, in Abbey Town, Highlaws, Pelutho, Bitterlees, and West Silloth, should be noted:—

"Much of the cottage accommodation for the working class is of a very inferior description. In spite of the rural character of the district, houses were seen both at Abbey Town and Highlaws which had no external space whatever belonging to them, and were in consequence entirely without privy accommodation. Owing, it was said, to the scarcity of cottages, people with families were found occupying cottages much too small for the number of inmates. Thus, in one case, a man, wife, and four children slept in a bedroom of only 740 cubic feet capacity; the floor of the room was almost entirely occupied by two bedsteads, so that the farther bed could only be reached by getting over the nearer one. In another the parents and five children slept in a room of about 1,000 cubic feet capacity, the window of which would not open. In both cases the air of the bedroom was close and stifling.\* Some of the cottages are dilapidated, so as to let in rain; some have earthen floors, and of many the bedrooms are low garrets with uncelled roofs, hot in summer and cold in winter, access to them being by a ladder. They are often very badly ventilated, the windows of the living room often not being made to open, while those of the bedrooms are commonly very small, and placed close to the floor, and open only to a very inadequate extent, e.g., the window may be a foot or fifteen inches square, one out of the four panes being made to open."

Who are the landlords who are not ashamed to leave house property in this condition? The report further remarks:—"Some of the houses in Abbey Town have no water-supply, the inhabitants having to get water where they can." We have repeatedly had occasion to notice this statement in sanitary reports of the absence of water-supply in houses; hence, of course, limited use of water, drinking water

\* No wonder!



obtained from more than doubtful sources, "hand-flushed" closets, which almost invariably means, practically, never flushed at all, &c., &c.

IN a recent *Bulletin* of the French Ministère des Travaux Publics, the following statement is given as to the present available supply of timber in Europe, which appears to be as follows:—

|                        | Total Area<br>in 1,000<br>Hectares. | Extent of Forests<br>in 1,000<br>Hectares. |
|------------------------|-------------------------------------|--------------------------------------------|
| Austria .....          | 30,002                              | 9,777                                      |
| Belgium .....          | 2,496                               | 459                                        |
| Denmark .....          | 3,957                               | 190                                        |
| France .....           | 52,840                              | 9,388                                      |
| Germany .....          | 54,060                              | 13,900                                     |
| Great Britain .....    | 31,495                              | 1,261                                      |
| Greece .....           | 8,469                               | 550                                        |
| Hungary .....          | 32,311                              | 9,168                                      |
| Italy .....            | 28,632                              | 3,556                                      |
| Netherlands .....      | 41,297                              | 290                                        |
| Norway .....           | 31,820                              | 7,896                                      |
| Portugal .....         | 8,962                               | 471                                        |
| Roumania .....         | 13,140                              | 2,000                                      |
| Russia in Europe ..... | 541,964                             | 200,000                                    |
| Servia .....           | 4,859                               | 969                                        |
| Spain .....            | 49,724                              | 8,484                                      |
| Sweden .....           | 44,282                              | 17,563                                     |
| Switzerland .....      | 4,139                               | 781                                        |

Of the total area of the several European countries, a large proportion is consequently still covered with forests,—in Sweden, European Russia, and Austria with 39.7, 36.9, and 32.5 per cent. of the total area respectively; while in Hungary, Germany, and Norway the percentage of forest-covered area is 28.4, 25.7, and 24.5 respectively. Next follow Servia, Belgium, Switzerland, France, and Spain, with 19.9, 19.6, 18.9, 17.7, and 17 per cent., and Roumania, Greece, and Italy with 15.2, 13.1, and 12.3 per cent. respectively. The countries most devoid of forests are the Netherlands, Portugal, Denmark, and England, which have only 7.3, 4.8, and 4 per cent. of forest area respectively.

MR. SPEAR'S Report to the Local Government Board on the continued prevalence of diphtheria in the Aylesbury Urban Sanitary District deals, firstly and chiefly, with those aspects of the origination and spread of disease which concern medical rather than sanitary experts; but there is a second section added on the sanitary condition of the town considered in relation to diphtheria prevalence. The central parts of the town, it is noted, are irregularly laid out and closely built, with narrow, roughly-paved streets, and a market of which residents near it complain much on account of its defective paving and surface-drainage. In the more modern cottage-property, "the absence in the past of proper building regulations is conspicuous. Proper elevation above the ground-level, ventilation beneath the boards, the use of damp-proof courses, are especially requirements frequently lost sight of." The following remarks are made as to the state of the public elementary schools:—

"At the time of Dr. Gresswell's inquiry, the public elementary schools were found to be open to serious sanitary objection; on the ground, firstly, of inadequate room ventilation, and, secondly, on account of defective drainage and closet arrangements. The ventilation has, in most instances, been considerably improved by the introduction of what are known as Tobin's tubes, as to which, however, it appears to be forgotten that cleansing is required. In the matter of drainage the alterations effected cannot be spoken of as adequate. At the British Girl and Infants' School flushing apparatus has been attached to the closets, and some ventilation by pipe shaft has been provided in the drains. The closets, however, are still practically within the school buildings, and the infants' school-room, especially, is not sufficiently removed from danger of air-contamination from this source; the danger being the more serious from the extremely defective and foul condition of the public sewer or culvert into which the closets discharge. At the St. John's and the St. Mary's Schools, a daily flushing of the closets by hand is still relied upon."

The italics are ours. Too much stress cannot be laid on the mischief that is certain to ensue among the lower and "lower middle" orders when closets are left to be flushed by hand. Indolence, supplemented by bad habit, always leads to entire neglect in such cases. It is difficult enough to get such people to attend to cleanliness and keeping up sanitary

conditions, even when it is made as easy as possible for them; how much more so when it is made difficult and inconvenient? But let us see what is said about the kind of "sewer or culvert" into which the school-children's closets discharge:—

"Of these old culverts there are, it is estimated, some 5,000 yards in the town. They are built of loose brickwork, allowing percolation to take place freely into the soil, and those that I saw opened contained a large amount of thick black sludge. They lie generally shallow beneath the surface, and are occasionally beneath the kerbstones, so as to be quite close to the foundations of houses. Of many of them, however, no information whatever is obtainable, and from a not inconsiderable number of houses all excrement and slops (for it is to be remembered that this is now a 'water-closet town') go no man knows where."

Well might we exclaim with the poet,—

"Oh, sacred nurseries of blooming youth!"

Only here we must adopt "sacred" in its alternative Latin sense, which our French neighbours have preserved in their "sacré." The report adds that the attacks of diphtheria have shown a remarkable tendency to localisation, and "detailed examination of the circumstances shows these localisations to have been in almost every case associated with grave defects of sewers and drains."

WE have been asked to call attention to the Architectural Association Class for the Study of Water-colour Drawing, which is once more being formed, and will again be put under the charge of Mr. A. W. Weedon, who has so successfully conducted it in former years. The fee for six indoor and six outdoor lessons is exceedingly small, and only ten students are required to form the Class; yet there seems a hanging back on the part of those who might gain so much at so small an expenditure of time and money. A preliminary class has been most successfully constituted, and will be taken charge of by Mr. W. Millard, and it only remains for those who have gone beyond the preliminary stage to show that they have as lively an appreciation of their opportunities as their juniors. All particulars may be obtained from Mr. W. G. B. Lewis, 28, Chatham-place, Hackney.

#### LETTER FROM PARIS.

A KIND of fatality seems to pursue the painters chosen to execute the Hôtel de Ville decorations. Gustave Boulanger and Peyen-Ferrin have died, and now Cabanel and Lavielle have in turn disappeared.

Cabanel leaves an important collection of works behind him; and whatever may be the ultimate judgment on his value as an artist, his unwearied labour for so many years, his influence on contemporary art, the dignity of a life devoted entirely to his work, and his devotion to his numerous pupils, will ensure the respect to his memory of all who have known and appreciated him. Alexandre Cabanel was born in 1823 at Montpellier, where (according to his desire) his remains have been interred. He was a pupil of Picot, obtained the Grand Prix de Rome in 1849, and medals in 1852 and 1855. In 1863 he succeeded to the position of Horace Vernet at the Institut; in 1863 became Officer of the Legion of Honour, and Commander in 1884; and obtained medals of honour in Salons of 1865, '67, and '78. In the course of his brilliant career, Cabanel was by turns, and by a sudden transition, first one of the most flattered and then one of the most sharply attacked of all French painters of the day. The critics of the new school, however, always spoke of him with respect, however strongly they may have attacked his artistic position.

His first work, in 1844, was the "Agony of Christ" on the mount of Olives. On his return from the Villa Medicea, he exhibited a "St. John," the "Death of Moses,"—a very remarkable picture,—and others, of which the drawing and design were of the highest class, whatever criticism might be made about the colour. Cabanel never was, in fact, anything of a colorist; he was a splendid draughtsman. His full talent was perhaps first shown by his two pictures exhibited at the Salon of 1855, the "Christian Martyr" and the "Glorification of St. Louis." But the great

success of Cabanel dates from the Salon of 1861, where he exhibited several other works of unusual ability, and where his "Naissance de Venus" elicited enthusiastic admiration, and at once gave him the position of a recognised master. Unfortunately for his artistic fame, the success of his portraits of "The Empress Eugénie" and "Napoléon III." transformed Cabanel into a "Society" painter, a position from which he never emerged to the end of his career; and his later works of an ideal type,—such as his "Paradis Perdu," "Death of Francesca di Rimini," "Lucrece and Tarquin," &c.,—had none of the inspiration of his earlier paintings. Absolutely devoted to his pupils, Cabanel had the honour of forming a whole pleiad of artists of talent; Henri Regnault, Henri Lévy, Octave Cormon, Benjamin Constant, Comerre, Bastien-Lepage, Gervey, Humbert, Chabrian, Raphaël Collin, Aimé Morot, François Flameng, Georges Cain, Pelez, and many others, claimed him as their teacher, and regarded him with a kind of adoration. He will always be cited as one of the master artists of his own generation.

The life of the landscape-painter Lavielle was as unprosperous and unhappy as that of Cabanel was brilliant and successful. He was the son of a labouring man, and obliged himself to work with his hands all day, while in the evenings he studied in the studio of Corot, and at last got into the Salon of 1844 a picture,—a view of Fontainebleau,—which excited attention. After that he appears at all the successive exhibitions, fighting hard for a position, and obtaining medals in 1849 and 1864, while in 1870 one of his landscapes brought him the reward of the Cross of the Legion of Honour. Unhappily his success never led to fortune; the sale which he made, two years ago, of a number of his pictures and studies, brought very meagre results, and the poor artist, unrecognised by the general public, in spite of his real talent, died almost in poverty.

The death of Edmund Hédon, the well-known engraver, is also to be recorded. He was born, like Lavielle, in 1820, and studied under Delacroix, then with Nanteuil, and became known as a painter of scenes of rural life; obtaining medals for this class of work in 1848 and 1855. He is, however, best known as an "aquafortiste," and his plates obtained medals in 1862 and 1872. Among the best are the illustrations to "Manon Lescaut," those to Sterne's "Sentimental Journey," and those to the "Théâtre Molière"; the latter gained him a medal of honour in the Salon of 1888.

The Committee for the Decoration of the Hôtel de Ville, all whose decisions so far, without exception, have been ratified by the Municipal Council, is proceeding with its further labours. To fill the place of Lavielle, who was to have painted a landscape in the Salon des Lettres, they have appointed one of his best pupils, M. Eugène Berthelot. M. Raphaël Collin having declined his commission, has been replaced by a lady artist, Mlle. Forget. Without wishing to criticise the choice, one might observe that if the feminine element is to be introduced into the decorative work of the Hôtel de Ville, there are other names with certainly stronger claims, especially that of Madame Demont-Breton. At its last sitting the Committee gave its unanimous approval to the sketches submitted by Mr. J. P. Laurens for the room entrusted to him. These sketches exhibit a retrospective illustration of Parisian history from the time of Louis le Gros. Among other incidents represented is the revolt of the "Maillottes," Etienne Marcel rescuing the Dauphin, the conflict between Henri II. and the Parliament, the arrest of Councillor Broussais at the time of the "Fronde," and lastly, Louis XVI. entering the Hôtel de Ville, under the "voûte d'acier" formed by the swords of the Freemasons crossed over his head.

While MM. Bonnat, Besnard, and Jules Lefebvre, and the artists who are to work with them, have still to submit their sketches, the business now remains of arranging the competitions for the remainder of the work, especially for the room which is to be illustrated by subjects from the siege of Paris.

M. Alphonse addressed to the Minister of Commerce, as General Commissioner for the Universal Exhibition, a report up to the close of last year, which gives the most faithful compendium available of the work done on the Champ de Mars during the year 1888. According to this report, everything leads to the expectation that the Exhibition will be opened at the day and hour fixed upon. The Palais des Arts Libéraux and the Palais des Beaux Arts



is now completely ready for the reception of exhibits, and the Galerie des Machines is sufficiently advanced to commence the placing of exhibits, though it still requires some minor constructional work to be completed. In the "Palais des Expositions Diverses," the galleries were placed at the disposition of exhibitors since September, and their arrangement has been in progress since then. Concurrently with these interior arrangements the exterior decoration is being going on, and is nearly completed, but good deal of the decorative scheme has had to be modified in execution. That the work is to be completed in the time available can hardly admit of a doubt, and the financial position of the undertaking is stated to be so good as to give promise of a considerable saving on the estimated expenditure. It may be added that the system of roads and tramways for the transport of objects to be exhibited is now complete, and everything is ready for the conveyance of exhibits to their places.

The National Manufacture of Mosaic is at present occupied in putting up the decorative doorway which is to give access to the rotunda building reserved for the products of Sévres, Limoges, and Beauvais. The general design is by M. Paul Sédille, who has also designed the pendants in detail, while M. Olivier Merson has designed the two figures representing "La Ramique," and "La Tapisserie," which form decorative adjuncts to the doorway. After the exhibition is over this important piece of work will be utilised in one of the national museums, probably that of Sévres.

According to custom, the Government has decided the new year's fêtes the occasion for the distribution of official honours to a certain number of artists. Among those thus distinguished are M. Pascal, architect of the Bibliothèque Nationale and Professor of Architecture, who is named Officer of the Legion of Honour; M. Brunel, architect-in-chief of the Prefecture of Police, and M. Thierry, architect of the Palace of Compiègne, are both promoted to be Chevaliers. Among the painters who receive honours are MM. Dantan, Raffaëlli, and Georges Becker.

At the Académie des Beaux Arts the new list in the official list for 1889 are as follows: President, M. Chapu; Vice-President, Ambroise Thomas; Secretary, the Vicomte de la Borde; members of the Administrative Committee, M. Bailly and Chas. Garnier.

At the École des Beaux Arts the jury presided over by M. Gninain have decided the various competitions, of which the most important is that for a monument to Pierre Lescot, the Cour du Louvre. From among 122 designs the jury have conferred *secondes mentions* on ten. The mention for ornamental design has gone to M. Baillie, pupil of M. Gninain. The competition for "analytical elements" of design, the subject for which was an octostyle entablature of the Corinthian order, the jury conferred *secondes mentions* on forty-eight out of twenty-nine designs sent in.

Street-improvements in Paris are being pushed on, with the view of getting everything in the best order for the Exhibition. At present are occupied in finishing the Rue Monge, which, in its new section next the river, will be a curious corner of old Paris, especially the old hotel of the minister Colbert, of which the bas-reliefs and the fine staircase have been reserved in the Carnavalet Museum. It is in the Quartier Maubert, soon to be demolished, that there formerly stood the old buildings for the "Faculté des Arts" and the "École de Médecine et Chirurgie." The works of repair and restoration at the Pont Neuf are at length completed, and in a few days the channel will be entirely open for navigation again. Apropos of this, it may be added that there is some talk of opening a competition for designs for an entirely new bridge over the Seine, between Paris and Charenton. The probable cost is estimated at about 850,000 francs.

Among the schemes in progress is that for the electric lighting of Paris, for which the Government has granted concessions to six different companies. Outside the work to be done by these, the Halles Centrales, the Avenue Victoria, and the approaches to the Hôtel de Ville, as well as the whole of the Palais Royal quarter, will be lighted by electricity. Opportunity will be taken at the same time to extend the installation to the Cour du Carrousel, in order to do away with the engines now in the basement of the Louvre, and used to supply the electric lights. The presence of these constitutes a permanent danger to the great national

collection, in regard to which the Government has at length taken action, after many warnings and exhortations.

The Louvre collection itself has just been enriched by the addition of one of the best statues of Coysevox, the "Nymph à la Coquille," which, since the time of Louis XIV., has decorated the "Bassin de Latone" at Versailles; and there are shortly to be two new sculpture-rooms open, dedicated to sculpture of the Middle Ages. After two years, also, it appears that the Government is at last thinking of turning to some account the funds gained by the sale of the Crown Jewellery. This sale realised about seven million francs, which M. Lockroy proposes to utilise thus:—

Two millions to form the nucleus of a fund for establishing or keeping up museums;

Two millions to rebuild the École Nationale des Arts Décoratifs;

Two millions for the Écoles des Apprentissages;

One million for subventions to mutual assurance societies.

The question of thus employing this fund is now under consideration.

An interesting exhibition of "Peintres-graveurs" has been opened at the gallery of M. Durand Ruel, in the Rue de Peletier; it includes more than 350 works,—etchings and lithographs of original subjects, not copies, as in the exhibition of the London "Society of Painter-Etchers." Among the best things are some masterly etchings by Bracquemond; landscapes and views in Paris by M. Félix Buhot; some remarkable plates by M. Besnard, especially the illustrations to the "Affair Clemenceau" and the portrait of Lord Wolseley; ten frames by M. John Lewis Brown, including pastels, etchings, and lithographs; three dry-points by Miss Mary Cassatt; twenty-four drawings and dry-points by M. Norbert Gruenette; an admirable portrait of Victor Hugo by M. Rodin (the sculptor); some dry-points by M. Desboutins; some charming English scenes by M. James Tissot; and lastly, six very remarkable landscapes by Mr. Seymour Haden. This exhibition, which has been very well organised and carried out, contains some works of the highest order of interest, and is a happy experiment out of the usual run of the annual exhibitions of Paris.

#### ROMAN ARCHITECTURE.\*

BY PROFESSOR AITCHISON, A.R.A.

It seems to me to be useful to ascertain the leading mental characteristics of a nation whose architecture we are going to study, so that we may not be led to waste our time on those parts of it which may be useless to us, nor, what is even worse, may deprave our taste; to see in what particular current its thoughts and inclinations ran, as in this direction it is likely to be strong, and its works are likely to be worthy of study, if not of imitation.

In my last introductory lecture I spoke of the Greeks, the most passionate admirers of the noble and the beautiful that ever lived,—the greatest as regards abstract thought, the expression of deep emotion, and perfection of form, with an instinct,—highly cultivated, no doubt,—that never erred in regard to taste; yet, in spite of these magnificent gifts,—in spite of a heroism unsurpassed in the world's history,—I think we must admit, though we may do it with reluctance, that the Romans, in some respects, were a greater people.

If we call the Macedonians Greeks, they, under Alexander the Great, carried their conquests in Asia farther and wider than the Romans, even to the "Storied Hydaspes" of India; but on his death parts were relinquished, and what remained was cut up into states, mostly fighting with one another, while the Romans held as an integral part of their Empire most of the countries they conquered, for "what they won with the sword they held with the plough," so that when they had settled down to a despotism, those parts of the world that stretch from Anglesa to the Tigris, from Morocco to the Red Sea, were governed by them, enjoyed the Roman peace, and were adorned with masterpieces of Roman architecture. I think I cannot do better than give you an extract from Dr. Mommsen's "History of Rome," which contrasts the gifts of the two

nations better, as well as more eloquently, than I have found elsewhere:—

"The two nations in which the civilisation of antiquity culminated stand side by side as different in development as they were in origin identical. The points in which the Hellenes excel the Italians are more universally intelligible, and reflect a more brilliant lustre; but the deep feeling in each individual that he was only a part of the community, a rare devotedness and power of self-sacrifice for the common weal, an earnest faith in its own gods, formed the rich treasure of the Italian nation. Both nations received a one-sided and, therefore, each a complete, development; it is only a pitiful narrow-mindedness that will object to the Athenian that he did not know how to mould his state like the Fabii and the Valerii; or to the Roman that he did not learn to carve like Phidias and to write like Aristophanes.

It was, in fact, the most peculiar and the best feature in the character of the Greek people which rendered it impossible for them to advance from national to political unity without at the same time exchanging their polity for despotism. The ideal world of beauty was all in all to the Greeks, and compensated them to some extent for what they wanted in reality. Wherever in Hellas a tendency towards national union appeared, it was based, not on influences directly political, but on games and art: the contests at Olympia, the poems of Homer, the tragedies of Euripides, were the only bonds that held Hellas together. Resolutely, on the other hand, the Italian surrendered his own personal will for the sake of freedom, and learned to obey his father that he might know how to obey the State. In such subjection as this, individual development might be marred, and the germs of falsest promise in man might be arrested in the bud; the Italian gained instead a feeling of Fatherland and of patriotism such as the Greek never knew, and alone among all the civilised nations of antiquity succeeded in working out national unity in connexion with a constitution based on self-government,—a national unity which at last placed in his hands the supremacy, not only over the divided Hellenic stock, but over the whole known world."

I think it best to describe the Romans, as far as I can, in their rude, early state, as yeomen farmers,—robust, laborious, and frugal, just, truthful, and honest, endowed with courage amounting to ferocity, for I think we ought not to doubt the character they gave themselves. When they became civilised, their poets and writers had to invent an early history for the nation, and to account for their ferocity made the fabulous founder Romulus suckled by a wolf. They were fearless, determined, and with a tenacity of purpose that has never yet been equalled in the world: full of common sense, highly conservative, and thorough believers in the paramount importance of subordination and implicit obedience. Each free man was determined to be sole master of his own, and to be solely responsible for what was under his jurisdiction.

This was so strongly marked that the wife did not hold the full position of a wife until she became the husband's absolute property, though the man was considered as accursed who sold her for a slave; and the *patria potestas*, or father's power, was such that it rested with the husband to settle whether his children should be killed or allowed to grow up, and when they grew up he had the power of life and death over them, and could sell them for slaves; and this power extended over the sons as long as they lived, and over the daughters until they were married. For instance, if the son was sold as a slave, and his owner gave him his liberty, he merely fell into his father's hands, who might then sell him again. Even under the Empire, the Emperors only reserved to themselves the right of manumitting the sons. No people had more of that practical sagacity that learns from defeat, nor were more ready to seize on, and convert to their own use, what they saw was better than their own,—the Samnite shield, for instance,—and the use of this sagacity became a proverb, "It is lawful to be taught by the enemy." A writer on jurisprudence told me that he was struck by the difference between the Greeks and Romans on that subject: the Greek jurisprudence was transcendental and *a priori*, while the Roman was thoroughly practical, and started from the facts.

\* Being the First Lecture on Roman Architecture this session, delivered to the students of the Royal Academy on January 28, 1889.

\* Mommsen's "History of Rome," vol. i., cap. 2.



The reverse of this picture is not so agreeable; they were as hard as iron, absolutely relentless and merciless, as fond of land and money as a miser who is a usurer as well, utterly destitute of humanity or magnanimity, as keen and cunning as a fox. Of each Roman it may be said—

"He, like Lysander, never deemed it sin  
To eke the lion's with the fox's skin"  
(Lord Lytton, "The New Timon").

and, as Bacon says of the ant, it "is a wise creature for itself, but it is a shrewd thing in an orchard or garden." So the Romans were not wise for themselves, but their wisdom was not very useful or agreeable to their neighbours, all of whom they absorbed or destroyed. They knew all the advantages of sticking to a bargain, and mostly did stick to it, if not too much to their detriment. "Honesty is the best policy" has all the appearance of a Latin proverb. Utterly destitute of cultivation, and not only dead to the Fine Arts, but holding in contempt those who admired them, and still more those that practised them, though perhaps this was hardly true of painting. It is said that if you want to know the bad side of an Englishman study him as a director. If you want to know the unscrupulousness of the Romans study them in their statecraft. Machiavelli's book on the first decade of Livy will fully enlighten you on this subject. The last Roman of distinction who exhibited in his own person most of these virtues and vices in all their native repulsiveness is Cato the Censor, though he lived when cultivation was beginning, and found the general taste too strong to ignore. He did more to ruin his country than all the demagogues, Milo and Clodius included, by insisting on the destruction of Carthage, for the Carthaginians were the only semi-civilised people who ever seriously alarmed the Romans, and, consequently, kept them straight. There is, too, much reason to fear that he was not altogether oblivious that these keen old merchants and traders of Carthage spoiled some of his bargains.

It is almost certain that the destruction of Corinth was due to mercantile jealousy, for there is no pretence that Rome had anything to dread from it but commercial rivalry.

There are some traits of the Romans in their corporate capacity that look like magnanimity. For instance, when Varro survived the rout at Cannæ, and came with the stragglers he had picked up by the way to the Mile's End, and sent to let the Senate know it, they came to him in a body, and congratulated him on not despairing of the salvation of his country.

The Carthaginians crucified their unsuccessful generals, and the Athenians put to death Lysicles, one of the two generals who lost the battle of Chæronea, to Philip of Macedon; but I am inclined to attribute this apparent magnanimity to shrewd policy. The Senate saw how much it might distract a general if he had to think of his own head, as well as of the battle. I say this because in the combats of gladiators they took the right from the victor to spare or slay his opponent, and conferred it on the rabble.

There is one piece of magnanimity or gratitude in Roman history, when Titus Quintus Flaminius allowed Greece to remain nominally free, though it turned out disastrously for the recipients, as they wanted a master.

To Greece the Romans owed their letters, the elements of their laws, their arms and military organisation,—in fact, they owed everything intellectual to it, and a good deal of what was practical, too. Pliny the elder says (lib. 34, cap. 12) that the arch was got from the Greeks, and though the Cloaca Maxima was built by an Etruscan, it is to be inferred that the Etruscans learnt the use of the arch from the Greeks. They did even before this show their recognition of what they owed to Greece by building the Græcostasis, and putting up statues of Pythagoras and Alcibiades; though the former is said to have been built out of gratitude to the Massiliots for sending a subscription to rebuild Rome after it was burnt by the Gauls (393 B.C.), and the latter was done at the command of the oracle of the Pythian Apollo, which ordered them during the Samnite war to put up in the Forum statues to the wisest and bravest Greeks, and the choice fell on Pythagoras and Alcibiades (lib. 34, cap. 12).

That the Romans had some acquaintance with the Greek, Punic,\* and Etruscan tongues at

\* In the *Penulus* of *Plautus Hæmo* speaks Punic; if the audience were ignorant of it the joke would have been a dull one.

a very early period is to be inferred from the great trade they carried on with those nations. Though Professor Middleton doubts if the Semitic language of Carthage was ever well known, as so few traces of it remain in Latin; but we may conclude from the following circumstance that their knowledge of Greek was not very accurate. In the early part of the third century B.C., "a friendly embassy was sent to the Tarentines, and the Roman envoys addressed the assembly in Greek. Their Greek, however, was so bad that they were grossly insulted by the Tarentine rabble, and the friendly embassy ended in a declaration of war. This war with Pyrrhus and the Tarentines, and the conquest of Sicily, the greater part of which was Greek, made the Greek tongue more generally known, and the subsequent conquest of Macedonia and the temporary pacification of Greece proper, made it familiar.

Early in the second century Greek became fashionable, for we read of Cato the Censor learning it when he was fifty, about 184 B.C. The schoolmasters of Rome had, too, before this begun to translate the Greek authors into Latin, and thus to lay the foundation for a Roman literature, of which, up to that time, the nation was wholly destitute.

In the latter part of the third and the beginning of the second century, *Nævius* (259 d. 204 B.C.), *Plautus* (254-184), *Ennius* (239-169), and *Pacuvius* (230-130), wrote plays and annals imitated from the Greek, and *Terence* (194-168), *Cæcilius* (—d. 168), and *Lucilius* (148-108) in the second. Almost every play of Terence, except the "Hecyra," or step-mother, is at its beginning stated to be from the Greek, and the main body are from Menander or Apollodorus. It is even hinted that the great lent a hand to these compositions, i.e., *Scipio Africanus*, jun. (185-129), and *Lælius* (186), and the first permanent wooden theatre was then built. The first stone one was Pompey's, built in 55 B.C., and, according to Plutarch, merely a copy of that at Mytilene. It must be borne in mind that the golden age of Roman literature was between the end of the first Punic war and a generation or two after the murder of *Gaius Gracchus*. *Cæsar* and *Cicero* wrote in a better style, but the nation was no longer capable of governing itself, and the later writers were merely the amusers or flatterers of despots.

Early in the first century, Greek became so well known that the great General *Lucullus*, when a young man, offered to write a history of the Marsian war, either in Latin or Greek; and as the choice fell on Greek, wrote it in that tongue, and Plutarch says that this history was extant in his day. Even before this we find Greek quoted and Greek words interspersed in letters and poetry, though in the Augustan age it was considered as vulgar to intersperse Greek quotations in serious writing, as it is now to quote French, Italian, or German, in English literature. I think I may say that, from the first century, all educated Romans could speak or write Latin and Greek with equal facility, and a man's education was hardly considered complete unless he finished his studies at Athens, or some other seat of Greek learning; and this went on until Greek was more familiar than Latin.

*Marcus Aurelius* wrote his book in Greek, and when the seat of empire was transferred to Byzantium, Greek was the court language, so that in the "Arabian Nights" we read of a man speaking Greek like a *Roman*. The chief Roman claim to admiration and gratitude is the teaching of mankind how to conquer and to govern; but they have subsidiary claims as well. After the conquests of *Julius Cæsar*, the Roman Empire acted as a bulwark of civilisation against the savage part of mankind, and transmitted to the West at least, the elements of Greek civilisation. Had it not been for them, we might now be as unfamiliar with Greek poetry and history as we are with the gods and heroes of the North and East. They, too, handed down Greek music, Greek sculpture, and Greek painting,—in an inferior form, no doubt, but still in a much higher form than it is exhibited by any other nation; and they transformed Greek architecture into a new style, Byzantine, which formed a basis for new and independent styles.

As far as the visual Fine Arts are concerned, Etruscan or native workmen appear to have supplied the sacred images in wood, earthenware, or bronze to the Romans; and it was not until the days of the great *Marcellus*, at the end of the third century, that real works of art

became known at Rome. He is blamed by Plutarch for corrupting the people by bringing the most valuable statues and paintings from Syracuse, and thus "furnishing them with an occasion of idleness and vain discourse; for they now began to spend a great part of the day in disputing about art and artists.

As early, however, as the fourth century, *Gaius Fabius*, the first historian of his age, surnamed *Pictor*, or the Painter, executed some frescoes in the Temple of Health on the Capitol, which were praised by the critics of the Augustan age, and he does not appear to have been found fault with for his indulgence in this art.

*Æmilius Paulus*, who finally conquered Macedonia, and who died in 160 B.C., was so much struck with *Phidias'* statue of *Zeus*, that he had his sons taught painting and sculpture, and one of those sons was the younger *Scipio Africanus*, who destroyed Carthage.

At the end of the second Punic War, B.C. 201, Carthage was like the lion in *Æsop's* Fables, who had his claws cut and his teeth drawn, it only remained for the husbandman to knock him on the head when he liked. Little more than fifty years afterwards this was done; some little cultivation, as I have just told you, was begun; but, at the end of the second Punic War the Romans may not inaptly be compared to a prizefighter who had bitten a man's nose off, and had temporarily disabled the only opponent he could not beat, when he was drunk with his left hand, and who at the same time had come into enormous wealth; in what could he do with it, but expend it in vulgar ostentation, in gross sensual indulgence, and in vice? So at Rome, enormous trains of slaves were indulged in, the extravagance of banquets became scandalous: *Lucullus* gave an unprepared dinner to *Pompey* and *Cicero*, which cost, for these three only, over £2,000; and a habit of gluttony prevailed that was truly swinish, if one were not labelling the hogs by the comparison.

In point of fact, the nation had been corrupted by the sudden accession of dominion and wealth, the absence of any competition, and the want of any cultivation to teach them how to spend their wealth nobly. The Senate had become an oligarchy, much more eager to enrich its members and the patriciate by the plunder of their fellow-countrymen and the provincials than to govern properly. The rapid decline of national virtue would be unaccountable had not the Romans been slaveholders. Stoicism alone could stem the corrupting influence of slaves, especially on the children, for not to abet every whim, however vicious, might expose the slave to torture, if not to death. The patricians had not only filched the commons from the people, but had acted like *Jezebel* by *Naboth's* vineyard, and when a reform was tried to be carried by that just, politic, and considerate man, *Tiberius Gracchus*, he was murdered at their instigation; his brother *Gaius*, the brilliant statesman and orator, finding those most interested in the welfare of the country resolutely opposed to any reform, had to carry his constitution by bribing the people to support him by free gifts of corn. You must recollect that the crisis had been severe. *Hannibal* had harried Italy from one end to the other, including *cis-Alpine Gaul*, so that doubtless thousands of homeless farmers and their families had taken refuge in Rome, not to speak of the destruction of the supports of families in a disastrous war of nearly twenty years' duration. Thousands of helpless free citizens had thus been of necessity turned into a worthless rabble, to whom nothing was left but to amuse themselves and to riot, not to speak of the inundation of Rome by foreigners, too many of whom were merely the ministers of vice; before, however, much good had been done by the new constitution of *Gaius Gracchus*, done by the new constitution of *Gaius Gracchus*, the patricians murdered him, too. Practically he was the last statesman that governed Rome; the chief power then became a military dictatorship. That second father of his country, *Gaius Marius*, who saved Rome from the Gauls, was proscribed by the Senate, whom he had most justly described as composed of contemptible persons, and civil war and anarchy reigned until a proper government was re-established by *Julius Cæsar*. *Mommson* gives the following account of the last days of the Republic:—

"If we try to conceive to ourselves a London with the slave population of New Orleans, with the police of Constantinople, with the non-industrial character of modern Rome, and

\* *Mommson's* "History of Rome," lib. 5, cap. xi.



agitated by politics after the fashion of the Paris in 1848, we shall acquire an approximate idea of the republican glory, the departure of which Cicero and his associates in their sulky letters deplore.

It was not till after the civil war consequent on the assassination of the Great Dictator (Julius Cæsar) was over, and the accession of Augustus to supreme power, that peace and plenty began to call for buildings on a large scale, though great buildings had been begun in Julius Cæsar's time. Everyone has heard of Augustus' boast, that he "found Rome of brick and left it of marble" (Suetonius Augustus, 29). It was necessary for him not only to find work for the people, but by the adornment of Rome, other Italian, and provincial cities with magnificent buildings, to turn the people's thoughts from their loss of liberty. Necessary as it is for people who cannot govern themselves to have a master, few are ready to acknowledge the necessity and abide by the result. Julius Cæsar fell a victim to this jealousy, and it required another half-century of civil war and anarchy to reconcile the people to a despotism.

That the Romans always held up to admiration their early Republican State, i.e., when they were merely ferocious peasants,—may be read in the works of their poets and rhetoricians, most of whom were lapped in every sort of delight and luxury, and yet pretended to regret the time when men dwelt in mud hovels, tilled their own fields, fed on porridge, salad, and beans, with a rasher of bacon or a piece of roast pork on festival days, and only washed themselves every ninth day.

This admission that no Roman would be virtuous unless compelled to be so by necessity was not true, as we see by the few good Emperors and the few good Statesmen, and must be looked on as a most immoral doctrine. Instead of deploring their power and riches, they should have pointed out how greater temptation was to be resisted by greater strength of mind, and by working out nobler ideals. Nature herself shows us that neither riches nor power will make a man's body fit and beautiful. This can only be obtained by temperance and exercise; and the same is true of the mind, only the exercise must be mental. Take the allied vice and virtue, ferocity and courage. We do not increase our courage, but our ferocity, by witnessing persons being torn to pieces by wild beasts, or butchering one another. Yet that sham philosopher Cicero upheld it.

As usual, demoralisation began from above. The nobility forgot its definition "hereditary virtue," and began to live viciously and bestially, and to plunder the poor, and necessarily to lose its keen sagacity in law-making; the rabble, and not merely the purely Roman or Italian, but the Eastern rabble, and slaves got to be of political importance; and from selling corn below its value to the people, they gradually got to be fed gratis, so that this enormous and growing mass had no need of industry to live, and had nothing to do but amuse themselves and riot. The offices of state were bestowed by the sweet voices of the multitude on those who provided the best shows and fed them. Scarcely any man's fortune was enough for this, so money was borrowed at 60 per cent. till the candidate could get a pro-Consulship. Julius Cæsar owed two millions sterling when he got appointed to Gaul. When the pro-Consulship had been obtained, money enough had to be got by plunder and extortion to pay off the debts and interest, to bribe the judges, and to leave a handsome fortune as well. It is an old axiom that you can always produce a tyranny by the bestowal of universal suffrage.

Next as to the cultivation of the upper classes. There is an anecdote that shows the general state of culture in the fine arts amongst them.

In the second century, when Lucius Mummius had sacked Corinth, B.C. 146, he shipped that part of the plunder which consisted of the priceless masterpieces of Greek sculpture, and made the ship-owners enter into a bond to replace them if they were lost or damaged.

Another is at a later date, i.e., in the first century B.C., when Cicero published his oration against Verres. Cicero himself was an amateur of the fine arts, and a collector of pictures, statues, and articles of vertu,—a taste then common to his class, who to the last were much more collectors, particularly of *bric-à-brac*, than patrons of the arts; pantomime, too, being their favourite form of the drama; but he knew how unpopular such a taste was, so he inserted into his published oration a piece of

clap-trap to win his countrymen's applause. Pliny, the younger, in his letter to Tacitus on pleading (Lib. i., Letter 20), proves that published speeches are very much curtailed as well as embellished. He says:—"It is for this reason we find in many of the best orations extant numberless expressions which have the air of unpremeditated discourse; and this even when we are sure they were never spoken at all. As, for instance, in the following passage from the oration against Verres (he here quotes from it Cicero's words), 'A certain mechanic' (here Cicero asks his secretary),—'What's his name? Oh, I am obliged to you for helping me to it. Yes, I mean Polyclætus.' Cicero himself and his hearers being as familiar with the name and works of Polyclætus, as educated collectors are in the present day with the names and works of Titian, Correggio, or Paris Bordone. Virgil himself was not above this. We all know:—

"But Rome! 'tis thine alone with awful sway,  
To rule mankind, and make the world obey,  
Disposing peace and war, thy own majestic way."

All that was thought reputable, even then, was to till the land, to learn military discipline, to fight, to rule slaves, to make laws, and to persuade freemen; though you might even on festival days play the flute; everything else was only thought fit for mechanics, and was therefore contemptible, or for slaves, and was consequently disgraceful. The Roman soldier who tried to stab Nero upbraided him with turning fencer, coachman, and fiddler. For a girl to learn to dance was an unspeakable infamy, and we see how they encouraged the fine arts; they whipped the actors if they did not please them, and put the poets in prison if they dared to touch on politics, or even to make jokes on public men. In consequence of the conquest or settlement of foreign towns, some of the tribute paid by them to Rome had to be expended in them on works of utility or on buildings for amusement, and in consequence of new Roman colonies being settled abroad, a vast number of new public buildings had to be erected. It gradually dawned on the Romans that to make their buildings not only shapely but magnificent was, as it were, putting the official stamp of the city of Rome on their conquests, settlements, or colonies. It may have even occurred to some of philosophical mind that the buildings erected might serve for a proof of its former greatness, when the Roman Empire had ceased to exist. Be this last as it may, the Romans were the greatest builders, and of the most colossal and enduring buildings, the world has seen since the days of Egyptian greatness. Architecture in the days of antiquity did not confine itself to the adornment of buildings, not even to the building of edifices alone, but included everything that was to be constructed,—roads, bridges, ships, and machines, and what we should now call philosophical instruments; consequently, every army must have had its architect or architects, and great experience must have been got by the building of fortifications and fortresses, and by the destruction of these and of towns. There were, too, as we learn from Juvenal, great advantages in being attached to the army, so we may readily imagine that many young Romans were brought up to be what we should now, alas! call military engineers. I fancy Vitruvius must have been one, or how else could he have come across Julius Cæsar, as we learn he did from his preface?

The bulk of architects were, doubtless, Greeks, but we learn from Vitruvius that there were Roman architects, one of whom, Cossutius, was a Roman citizen. This does not seem much to us, but it meant a great deal then, to say the least; he could not legally be ill-treated, nor scourged, nor even put to death without his condemnation being approved by the highest authority at Rome; and even were he put to death, his property could not be confiscated. I say legally, because Verres did crucify a Roman citizen. Cossutius was entrusted by Antiochus Epiphanes with finishing the temple of Zeus Olympius, at Athens; and when I say finishing, I might say constructing, for there was nothing done but the foundations. This vast expenditure on the Greek temple probably occurred before Antiochus got his kingship in 175 B.C. Vitruvius says that Fuscitius was the first Roman architect who wrote a treatise on architecture, but the treatise has perished, and we do not even know

its date. He also tells us that Gains Mutius, who built the cell of the temple to Honour and Virtue, near the trophy of Marius, left no treatise, and says, "it therefore appears that our country can boast of as great architects as Greece herself." Count Nispi-Landi believes that Lucius Cocceius Auctus, a freedman, was Agrippa's architect, and designed the Pantheon at Rome. That the bulk of the architects were slaves or freedmen I think we may infer from Plutarch; for he says, in his "M. Crassus," speaking of Rome, that "Crassus, observing also how extremely subject the city was to fire, and how frequently houses fell down, which calamities were occasioned by the height of buildings, and their standing so near together, he bought slaves that were builders and architects, and when he had got upwards of 500, he bought houses whilst they were on fire, and he bought others in the neighbourhood, which, by reason of the present danger and uncertainty, the proprietors were willing to part with for a small price, so that the greatest part of Rome came into his hands." I judge, too, from the names that the architects were mostly Greeks; as well as from Trajan's letter to Pliny the Younger, on his applying for architects from Rome. Trajan writes:—"As there is no province that is not furnished with men of skill and ingenuity, you cannot possibly want architects; unless you think it the shortest way to get them from Rome, when it is generally from Greece that they come hither" (Book x., let. 49).

From people of the character of the Romans we cannot expect to get high artistic sensibilities, all that we can expect is excellence of plan and of construction, for practical aptitude was one of their leading characteristics.

We see from Vitruvius that architecture, as a fine art, consisted in putting Romanised copies of the late degraded Greek architecture on the outside of their own national construction, a practice that by itself speaks of the absence of even the leading idea of architecture.

There are, however, a few points in the Roman character that I have not touched on, which are strongly exemplified in their architecture. The desire not to lose time or thought on trifles. Every little bird was called a sparrow, and every round fruit an apple, but a feeling of gravity and dignity ran through Roman life: the gladiator tried to fall becomingly, and to die with a composed countenance. The great Julius covered his face before falling from the wounds inflicted by his assassins, so we can imagine a Roman ordering his architect not to trouble him with such trifles as mouldings and the like, but to make his building rich, handsome, and dignified.

Here let me say that to get dignity in a building is no small achievement, nor is it to be accomplished without much pains and study, and I am sorry to say it is a characteristic that is too often wanting in modern buildings; consequently, a deep study of the proportions used by the Romans should be undertaken by every advanced student; and, I may add, that it is by no means necessary that the parts be coarse or rude. Infinite refinement and artistic invention may be added without in any way detracting from the dignified effect; for buildings, like other works of art, gain enormously in interest if the parts are as worthy of study as the whole. In Roman buildings of the highest class we overlook the faults if the general effect be magnificent and dignified, but it is the virtue and not the faults that give the dignity; the profiles are always coarse, and the ornament mostly devoid of high artistic excellence, and is mostly exuberant and overlaid; but it is not on account of these faults, but in spite of them, that we admire.

I think, too, that the Romans had a respect for costly materials and a true love for colour. Vitruvius, speaking of the Temple of Honour and Virtue, says: "This indeed had it been of marble, so that it might have as much dignity from its magnificence and costliness as it has subtilty from its art, would be named amongst the first and highest works" (Vit., lib. 7, cap. 1). And he gives a list of the marble temples in Greece, including that of Zeus Olympius by Cossutius.

The rage with which marble was sought for, and its extensive use when all buildings were coloured, show a taste for colour superior to the Greek. For the subdued tones and tints of marble, and its infinite variety of colour, must have been very superior to mere flat colour got by painting.

The colour, too, of internal decoration is

\* Dryden's Virgil, Æneid, 6, line 1173.

\* Roman Freedmen often took Greek names, though not Greeks themselves.



mostly rich and dignified; and almost always so when it is obtained by the use of marble.

I think, therefore, I can with certainty advise the study of Roman planning, not only for accurately fulfilling the programme, but also for obtaining grand effects. I can most certainly recommend the study of all the construction that is truly Roman, for in those parts which are merely applied Greek the construction is as bad in principle as the art is poor, for instance, in the case of lintels or architraves when made up of voussours; while the construction of the truly Roman parts is as true, logical, and daring as any in the world. Every material that was used constructively shows that the architect had an insight into when and how it would answer best. There is, too, not a little research in Roman buildings to find out how all unnecessary labour and cost may be dispensed with.

The main proportions may also be studied for obtaining grandeur and dignity. When, too, we consider that Roman architecture developed into Byzantine, and that this was the starting point for Romanesque, Gothic, and Saracenic; that in the hands of the modern Tuscans revived Roman architecture acquired a grace and finish only exceeded in the palmy days of Greece; and that the bulk of modern public buildings, not only in England but in Christendom, are but paraphrases of Roman architecture, I think we may truly say it is worthy of our deepest study.

It may be well now to take the list of Roman buildings from Vitruvius, and to note the buildings he describes, as they certainly include those of the latter days of the Republic, and I think as certainly exclude those of the Empire. Besides forts and cities, he speaks of the following:—Temples, both rectangular and round; the Forum and Basilica, the Treasury, the Prison, the Curia, the Theatre, its portico and its scenes; baths, the Greek Palaestra, harbours and buildings in water, private houses, both in town and country, for different classes. Although he speaks of the Circus Maximus and the Circus Flaminius, he does not describe a circus.

Subsequent to Vitruvius, we have the Thermae, the Palace, the Amphitheatre, the Triumphal Arch, the Prætorium, and, I may add, the vaulted Basilica. We must credit the Romans with the invention of the composite cap, *i.e.*, putting the comparatively heavy Ionic cap into a Corinthian one, and though they are far inferior to the Corinthian, where these last can be seen close, the composite is not without its merits when seen high up.

We must, too, credit the Romans with obtaining imposing and magnificent effects in their buildings, partly, no doubt, attributable to the colossal dimensions, but mainly to the proportions, which doubtless were sought for with eagerness and perfected by observation and study. We cannot doubt that many of their interior effects were superb; I say this with confidence, for though the interior cupola of the Pantheon is stripped of its lining of bronze and silver, its interior still remains the most impressive I have yet seen, striking one at the same time with awe and admiration.

#### CANOPY FROM ST. GEORGE'S CHAPEL, WINDSOR.

THIS rather curious piece of work formed a portion of a screen formerly in St. George's Chapel, Windsor; the part here drawn being now in private hands as a Mediaeval relic. The drawing was made by Mr. Jas. Bayly, of Weaverthorpe, by permission of the present owner.

#### Greek Mouldings Illustration Fund.—

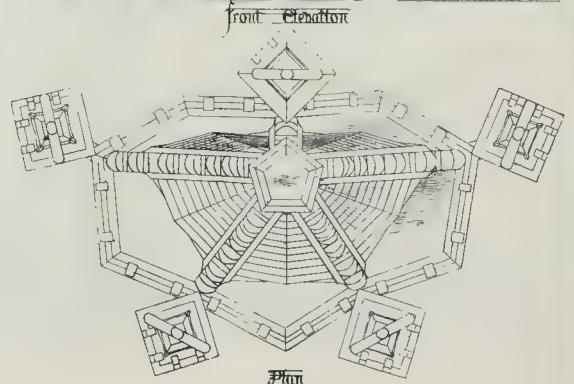
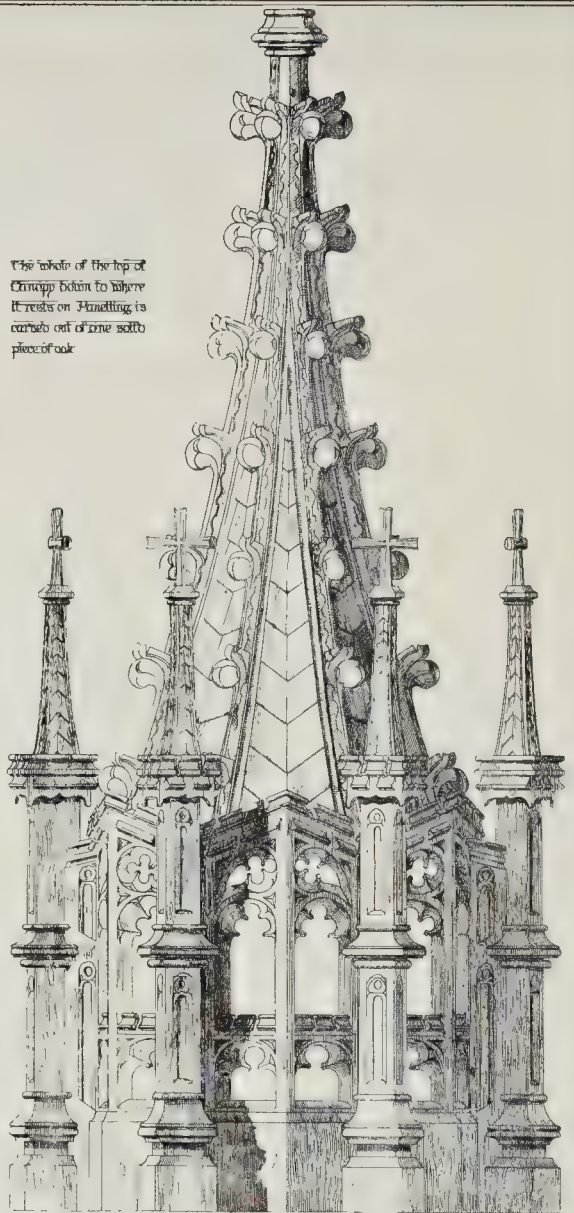
Mr. Penrose has received the following further subscriptions to this fund, through Mr. E. Runtz:—

|                                |    |   |   |
|--------------------------------|----|---|---|
| Messrs. Henry Good & Son ..... | £1 | 1 | 0 |
| Francis Ravenscroft, Esq. .... | 1  | 1 | 0 |
| Messrs. Reeves & Son .....     | 1  | 1 | 0 |
| Mr. John Runtz .....           | 1  | 1 | 0 |
| Messrs. Sprague & Co. ....     | 1  | 1 | 0 |
| Mr. S. Walker .....            | 1  | 1 | 0 |

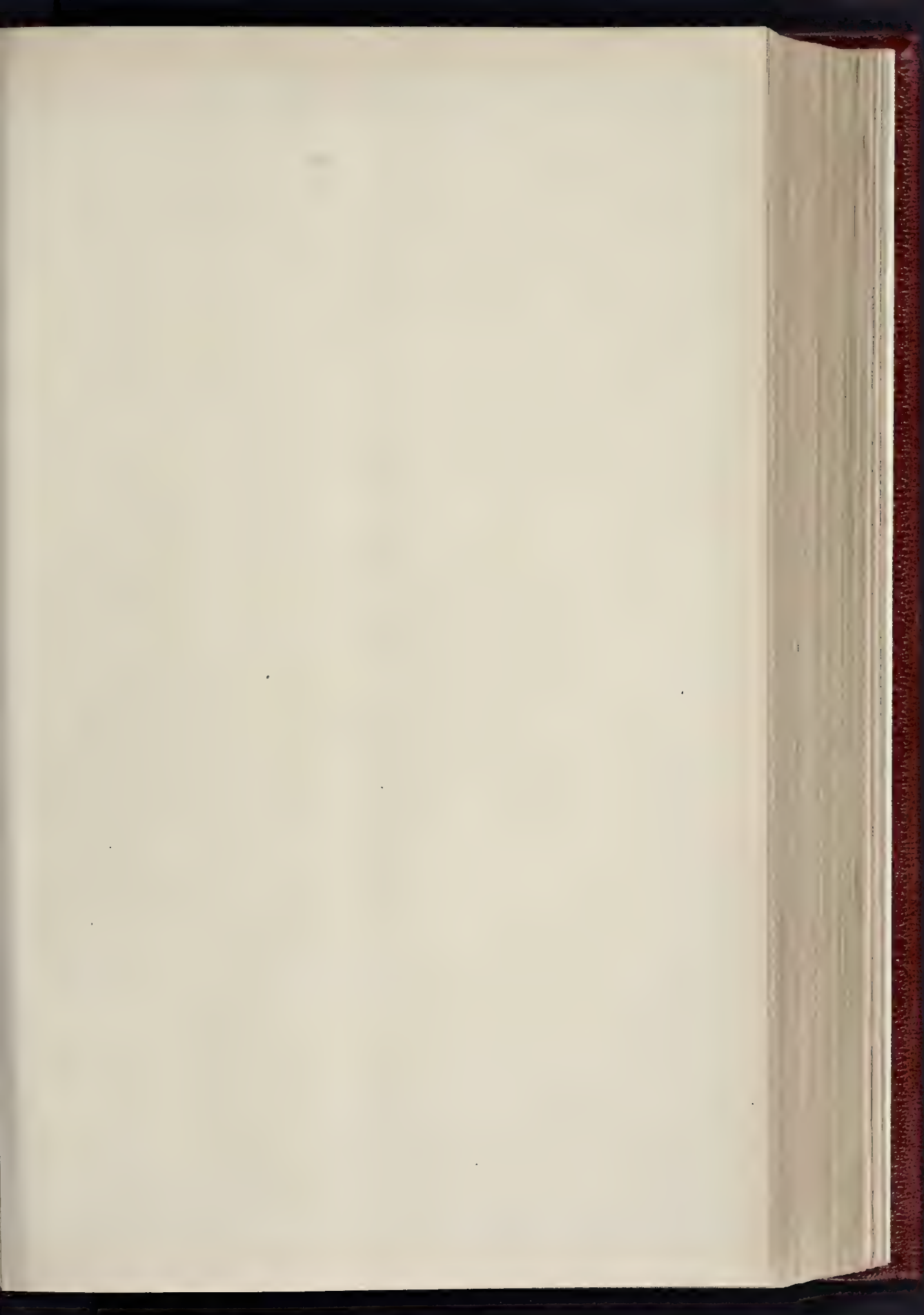
Also, in addition to the above list:—

|                          |    |   |   |
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| Mr. H. L. Florence ..... | £1 | 1 | 0 |
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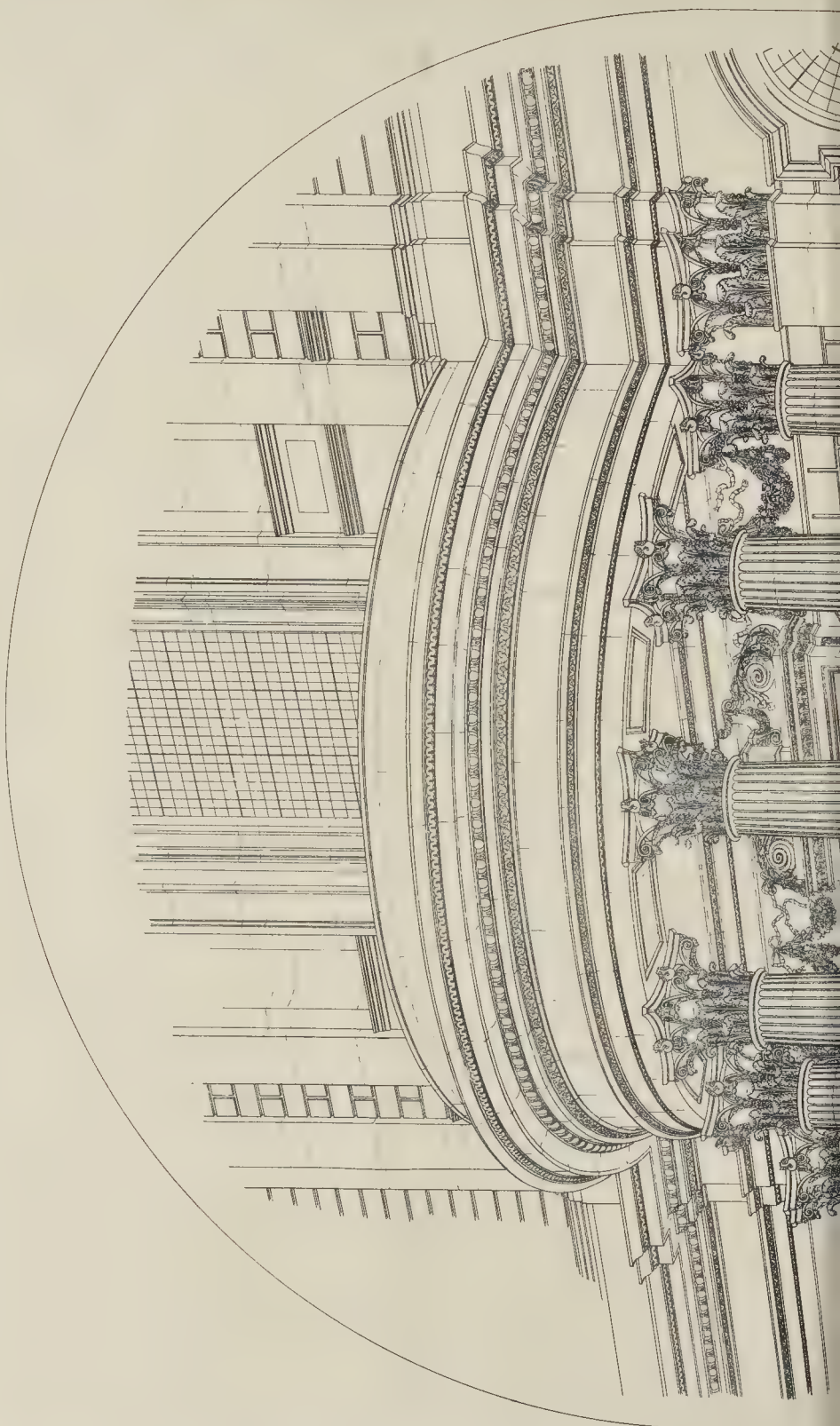
**The Iron, Hardware, and Metal Trades' Pension Society.**—Mr. John Aird, M.P., will preside at the forty-sixth anniversary festival dinner of the Iron, Hardware, and Metal Trades' Pension Society, to be held at the Hall of the Ironmongers' Company in May.



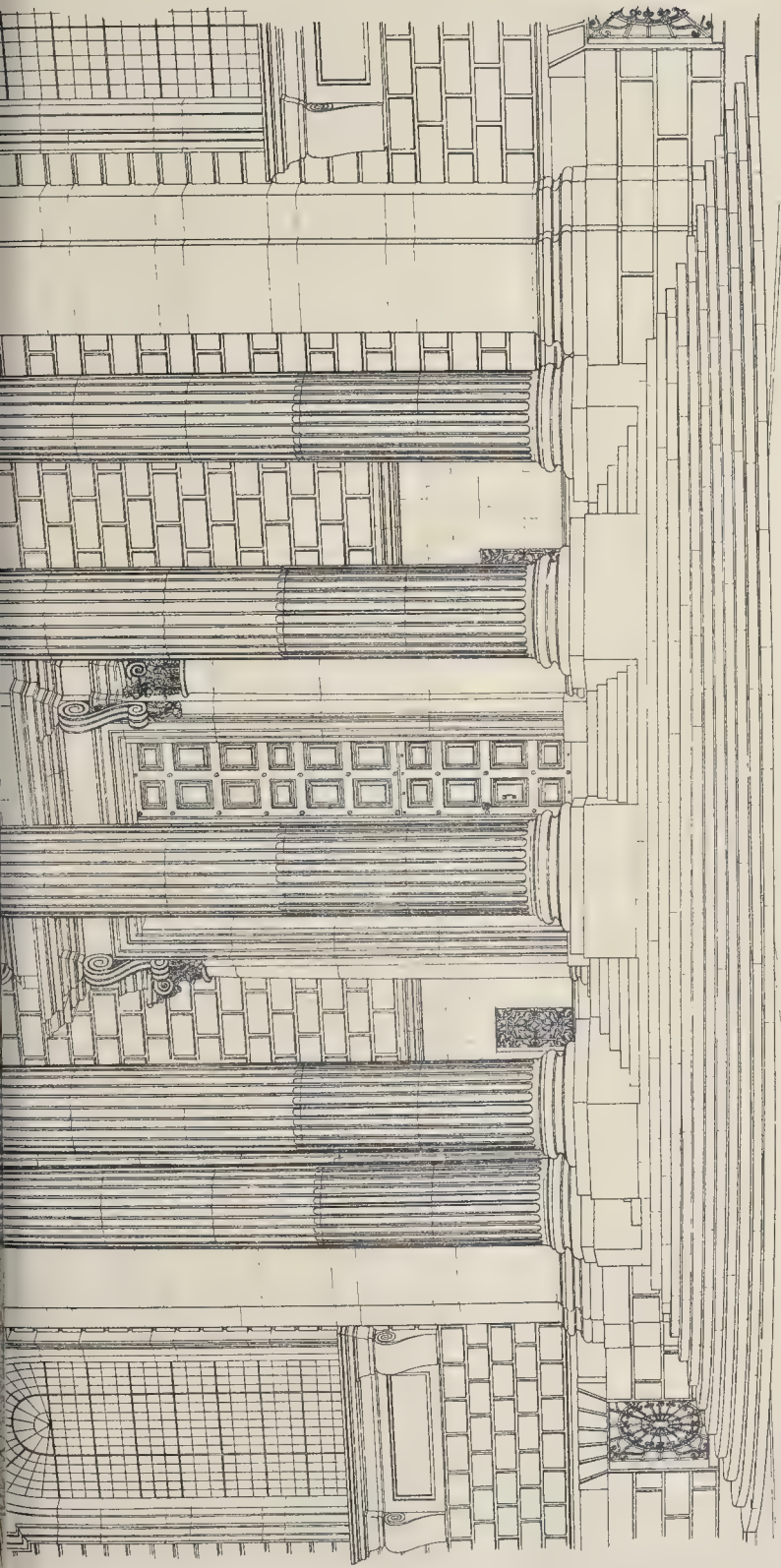




THE BUILDING, FEBRUARY 2, 1869.





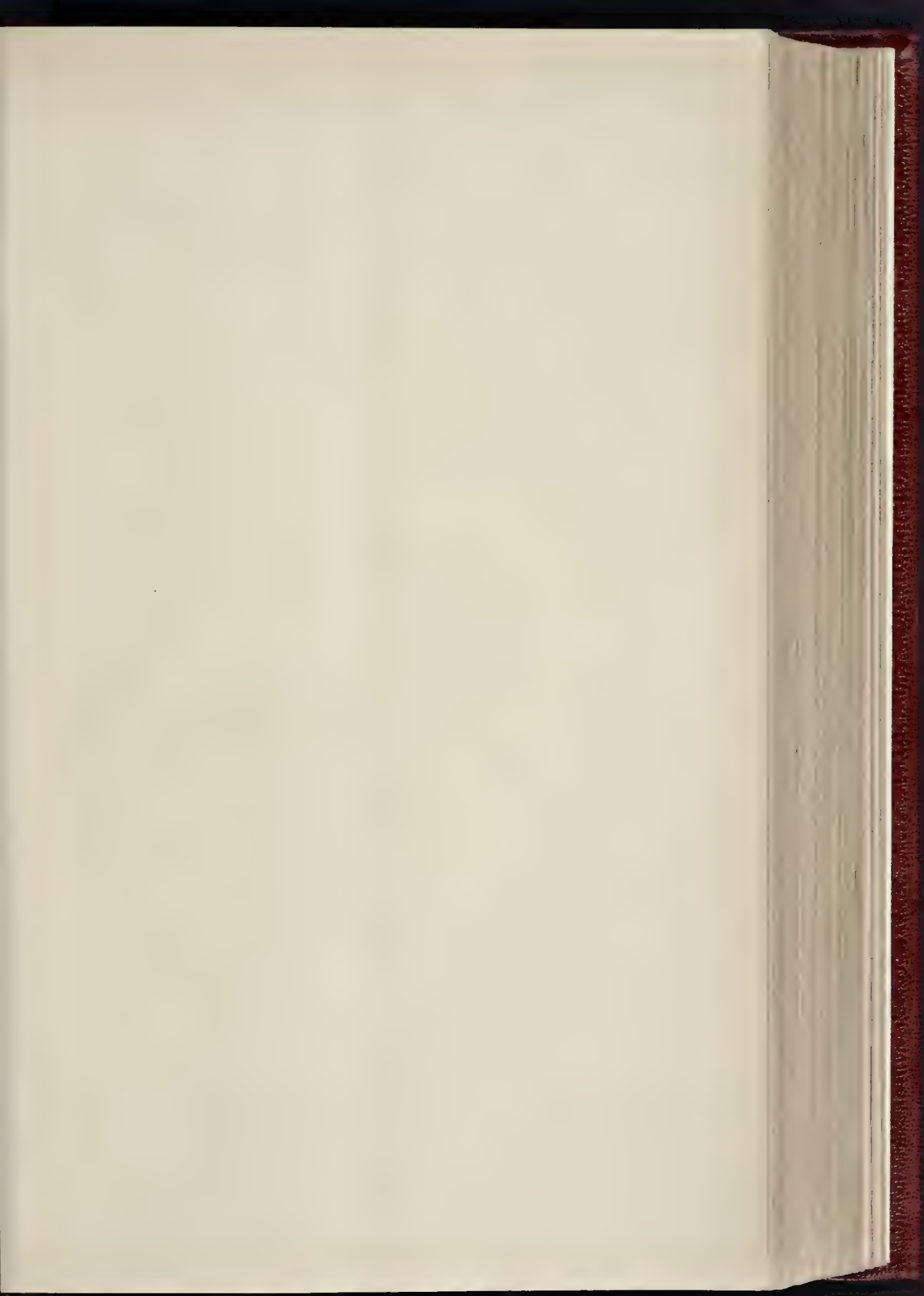


NORTH PORCH, ST. PAUL'S CATHEDRAL.—DRAWN BY MR. AMOS F. FAULKNER.

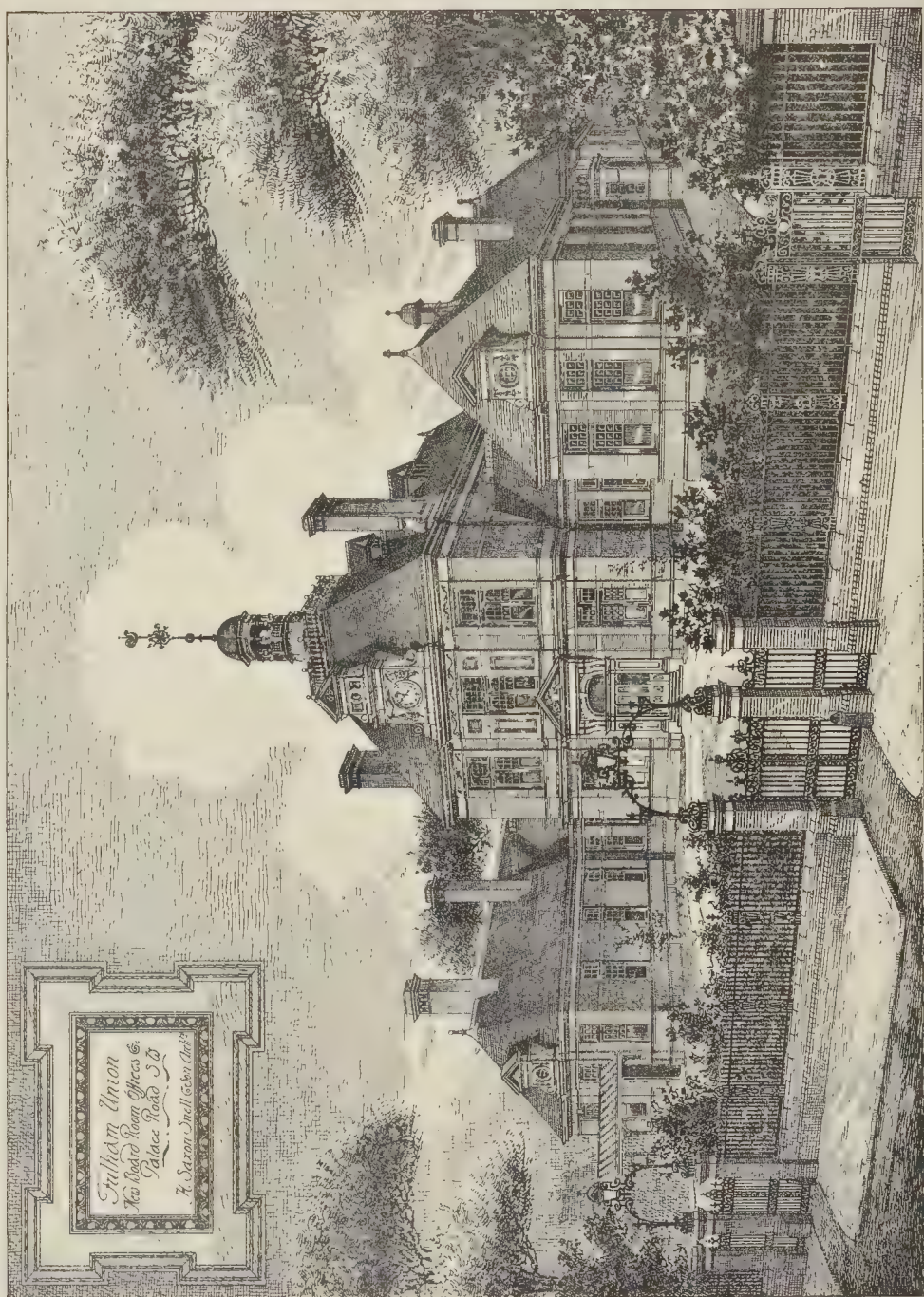
Awarded R. A. Silver Medal for Perspective Drawing, 1888.







THE BUILDER, FEBRUARY 2, 1889.





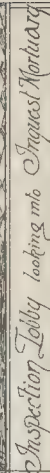
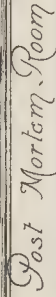
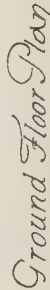
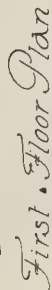
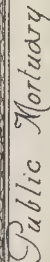
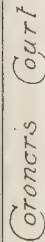
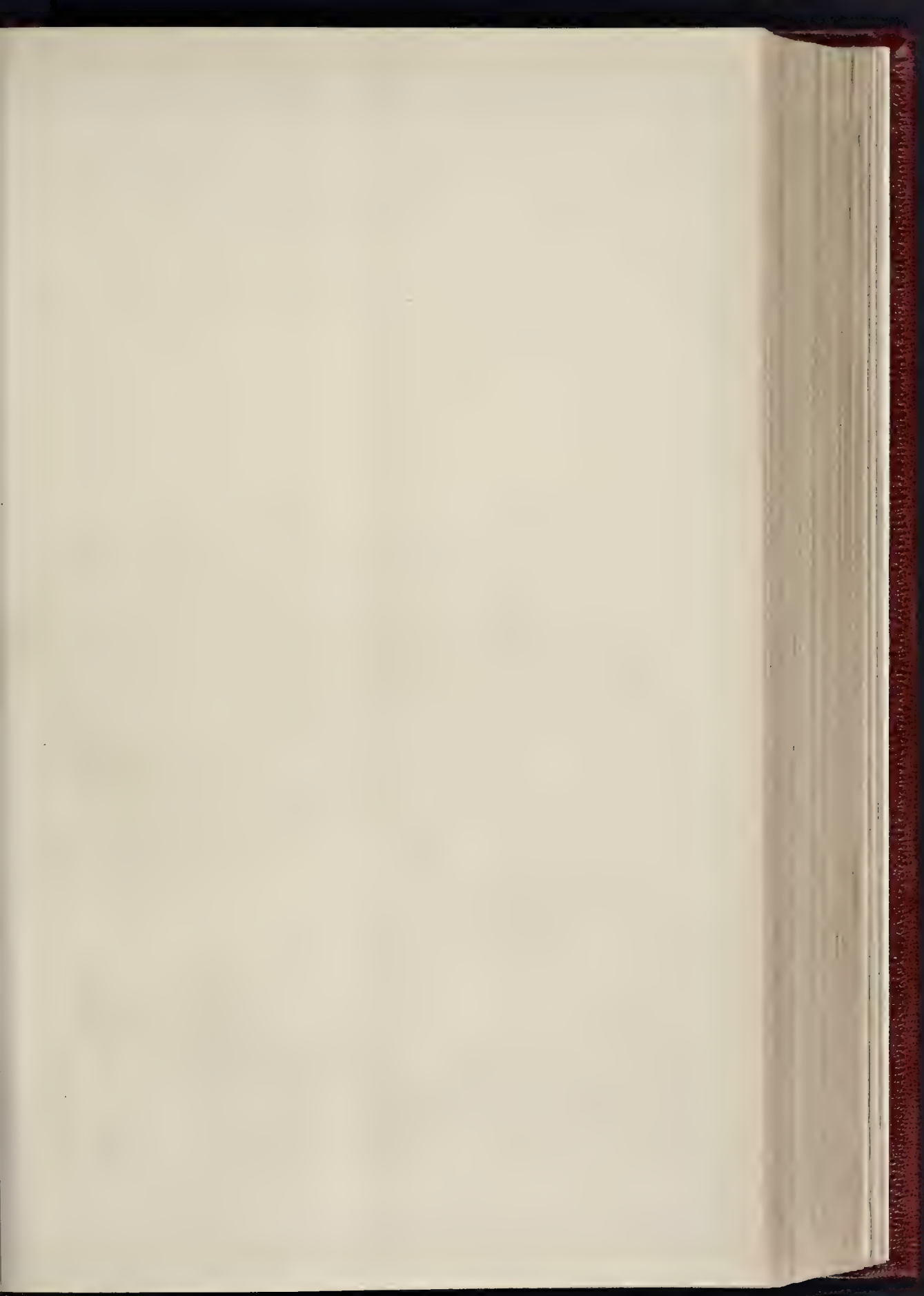


PHOTO & TWO SPRAYED & CO. BY HARRY ASHLEY CANON N.W. CHANDLER

NEW MORTUARY FOR THE PARISH OF ST. MARYLEBONE.—MESSRS. H. SAXON SNELL & SON, ARCHITECTS.









POMPEIAN HOUSE, ST. AUGUSTINE

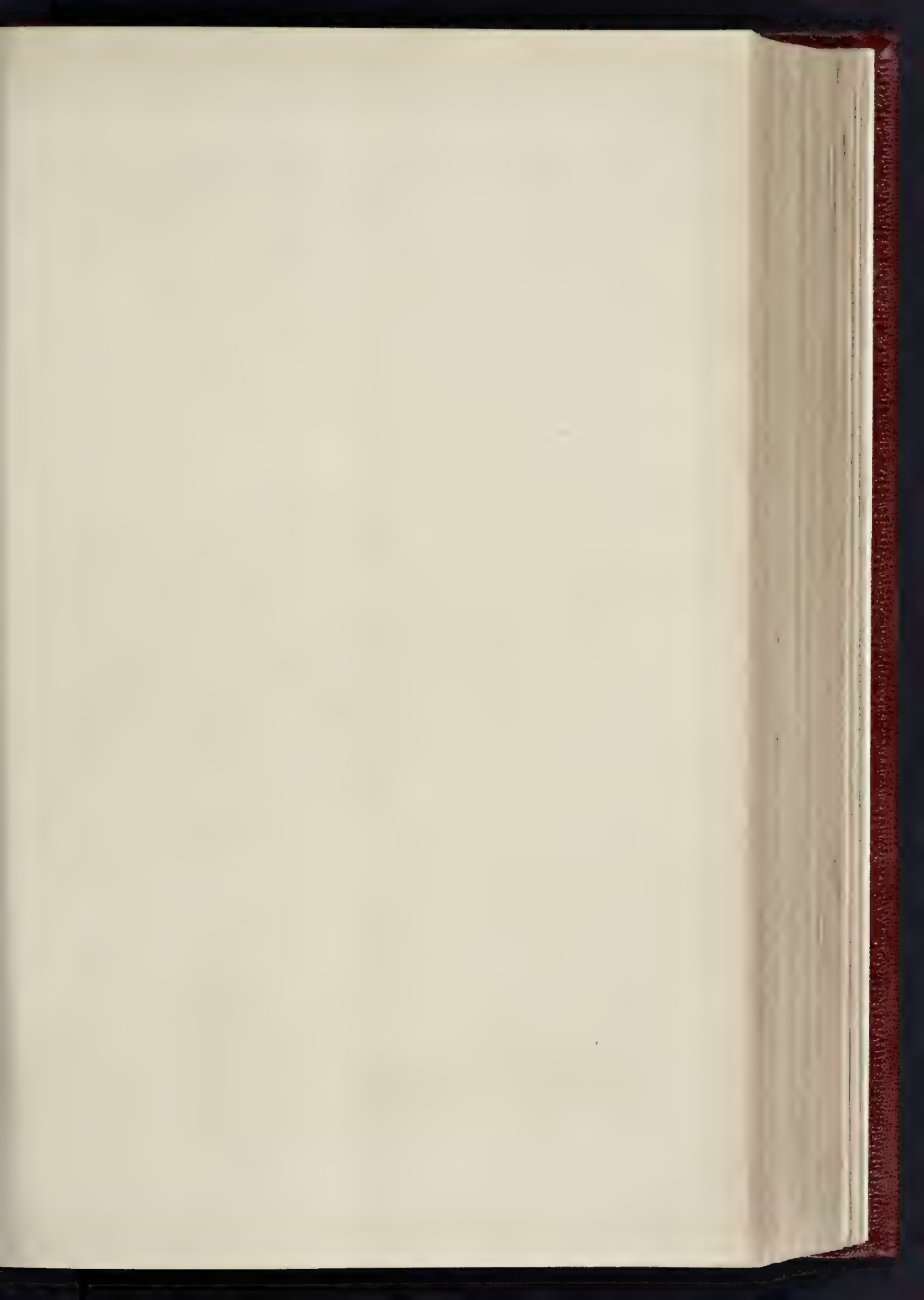




FOR MR. FRANKLIN W. SMITH.









POMPEIAN HOUSE, ST. AUGUSTINE  
VIEW IN ATRIUM.





: FOR MR. FRANKLIN W. SMITH.  
DS PERISTYLUM







### Illustrations.

#### POMPEIAN HOUSE, ST. AUGUSTINE, FLORIDA.

THIS Pompeian house, about to be erected at St. Augustine, Florida, one of the favourite winter retreats of American citizens, is, in the main, the idea of the proprietor, Mr. Franklin W. Smith, of Boston, who for some years has made St. Augustine his home during winter months. He has taken for his model houses more especially of Panama and Ballast, with a few modifications thought advisable to meet the peculiarities of the Florida climate (some seasons, the building will be a very reproduction indeed).

Externally, excepting for the caryatides of the solarium, it will be almost devoid of ornament, and will depend mainly on colour for effect. This will be for the most part red, covered with black and buff, and will be permanently obtained by the admixture of the colouring material with the concrete of which the walls will be formed. This concrete is composed of one part of Portland cement to three parts of sand and four of *coquina*, a minute shell-boss found abundantly on the sea-beach, and the uncoloured state, as used in Mr. Smith's house adjoining, has a beautiful pearly-grey.

The building, the foundations of which are now being laid, will be larger than any reproduction hitherto attempted, covering an area of considerably more than 100 feet square. This surpasses those at Sydenham and Aschafburg (the latter built by Louis, King of Prussia), or that of Prince Napoleon, in the rue Montaigne, Paris.

The atrium of this new construction will be 30 ft., the peristyle 52 ft. by 40 ft., the tablinum 20 ft. by 17 ft., the pinacotheca 17 ft. by 17 ft., the triclinium 30 ft. by 17 ft., and all other apartments in proportion.

The examples above-mentioned are, with the exception of the last, in an entirely unfurnished condition—an exhibit, merely, of bare walls—in dilapidated condition, the paintings in which the effect much depends being

marred and faded, whilst the house formerly owned by Prince Napoleon is now in a quite bizarre and incongruous condition, ornaments and furniture of various styles being intermingled.

Unstinted effort will be made, in the present instance, not only to reproduce the wall decorations from the original, but to fully furnish the various apartments with their appropriate furniture and appliances.

The atrium, in imitation of that of the house of Pansa, will contain statues of the Muses, casts for which are ordered from the British Museum and the Louvre; and for the other apartments busts and statues of the greater and the domestic gods, and models for architectural details, are ordered from the *École des Beaux Arts*, Paris.

The tablinum will illustrate the domestic household personages, from casts of "unknown" Roman heads in the Townley collection. From the same source will be drawn reproductions of an altar for the lararium, ornamental supports for furniture, the patera, hydria, krateres, cineria, &c., &c. For several of these appropriate patterns have been found in the great stores of the basement of the British Museum, which have never yet been cast or exhibited.

Both the summer and winter triclinia will be furnished with the couches for recumbent guests, of the precise size and pattern left in Pompeii. The various rich embroidered stuffs are being prepared in Paris, though it is doubtful whether modern work can approach that of the ancients—the Tyrian "purple," for instance, of the times of the Cæsars, having probably never been equalled.

Reproductions have been obtained, in part, from the Italian Exhibition, and others are being ordered from Naples, to supply the appropriate articles in bronze and terra-cotta, both for ornamental and domestic uses.

Curtains for all openings will be ordered of stuffs and patterns closely in accord with those indicated in paintings preserved, and other articles of furniture will be specially designed from models of the same origin.

There will be a large exedra, upon the walls of which will be executed, by French artists,

paintings of the Eruption of Vesuvius, and of historical and illustrative incidents, as, e.g., the Death of Pliny, sacrificial ceremonies, &c.

A striking architectural feature, and one that will be thoroughly enjoyable in practical use, will be the solarium, upon the roof of the main floor, providing an elevated garden and promenade, its trellises being supported upon caryatides and columns.

An artesian well will supply fountains for the peristyle, solarium, and the adjacent ornamental grounds.

Nor will illustrative literature be forgotten. The bibliotheca will be supplied with every volume available upon Pompeii or Herculaneum, and, as of collateral interest, the richest works extant upon Roman architecture and archaeology.

The building has been planned and contrived, and the general design supervised, by the owner; a good deal of the necessary drawing having been done by Mr. G. Hornblower, A.R.I.B.A., who executed the two drawings from which our illustrations are taken, and offered them, with the consent of the owner, for publication in our pages.

#### THE NORTH PORCH OF ST. PAUL'S CATHEDRAL.

THIS is a reproduction of the drawing that gained for its author, Mr. Amos F. Faulkner, the Royal Academy Silver Medal for Perspective Drawing in December last. As a careful and correct outline representation of the subject, it fully deserved to succeed, and is a fitting supplement to the beautiful measured drawings with which Mr. F. W. Troup won another silver medal in 1885, and which were reproduced in the *Builder*, in January, 1886.

#### FULHAM UNION OFFICES.

THIS building is now in course of erection on ground lately acquired by the Guardians next their Workhouse in Fulham Palace-road. It is set back 60 ft. from the road frontage.

It is designed to bring under one building the Guardians' offices, dispensary and relief stations, &c., for greater convenience of administration, and to replace old buildings which are now inadequate to accommodate the growing needs of the parishes.

The central block contains on the ground-floor the clerks' and registrars' offices, and a general committee-room, and on the first floor a large board-room and another committee-room, cloak-rooms, waiting-rooms, &c., the housekeeper's apartments, book-store, &c., being placed on the second floor, which is partly in the roof.

The south wing contains relieving officers' rooms, relief stores, lofty, well-ventilated waiting-rooms, and a committee room for inquiry by the guardians into the *bona fides* of the applicants for relief. Also at the rear a dispensary, with a waiting-room and doctor's consulting rooms.

The north wing contains on the ground-floor male and female receiving wards for the workhouse, and porter's apartments and office, and a waiting-room. On the first floor, and partly in the roof, are two large stores, to contain respectively the paupers' own clothing and their furniture. This last room is a new departure adopted by the Guardians to obviate the necessity, in the case of those who enter the house for a short time only, of parting with the little furniture they may be possessed of.

The architects are Messrs. H. Saxon Snell & Son. The builder is Mr. Thomas Nye, of Ealing, whose contract for the whole of the works, including fittings and every accessory, amounts to 17,100l.

#### NEW MORTUARY FOR THE PARISH OF MARYLEBONE.

THESE buildings are situated at the south corner of York-court (now closed), facing the old St. Marylebone Burial-ground, and are approached by a private roadway from Paddington-street through a somewhat handsome Gothic gateway.

The buildings are arranged in three distinct blocks, separated from one another by paved roadways. On the south side is the public mortuary, the internal walls of which are lined with light glazed tiling their whole height, the floor is tiled and the windows filled with tinted glazed lights. The east end of this room is divided off by a pointed archway, and will be available for use as a mortuary chapel for conducting funeral services.



On the north side are contained in one block a post-mortem-room and coffin store, also an inquest mortuary, and separated from it by a large glazed partition, a lobby for the convenience of jurors viewing the bodies. The arrangements in these two departments are very similar (although not on so large a scale) to those of the Morgue in Paris.

With the exception of the coffin store, these rooms are lined with high dadoes of white glazed bricks or tiles, and are amply lighted by windows and roof-lanterns. The revolving post-mortem-table has been specially designed for the building on improved principles.

The central block, which is two stories in height, contains on the ground-floor the caretaker's living-room and office, also a waiting-room for the accommodation of witnesses, or for the jury when in consultation.

The upper floor (approached by a stone staircase) contains the Coroner's court, Coroner's private room, and caretaker's rooms.

The court-room is warmed by a large open fire and hot-water coils. The fittings are of pitch-pine, varnished.

The whole of the arrangements have been carried out under the supervision of a committee, the members of which are Mr. Churchwarden White, Colonel Burges, Messrs. Edmund Boulton, M.A., J.P. (chairman), Hallam, and Reed.

The architects are Messrs. H. Saxon Snell & Son, and the builders Messrs. Wall Bros., whose contract for the works amounts to 3,131*l.*, including the heating and gasfittings, carried out by Messrs. May Bros. The tiling was executed by Messrs. Simpson & Son.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### THE PRESIDENT'S ADDRESS TO STUDENTS.

The fifth ordinary meeting of the present session took place on Monday last, Mr. Alfred Waterhouse, R.A. (President) in the chair.

Mr. J. Macvicar Anderson (Hon. Sec.) said that, as a number of students and of the younger members of the profession were present, he wished to make two announcements which might be supposed to be of interest to them. The first was that the Worshipful Company of Painters had for the second time offered a Travelling Studentship of £50 for the encouragement of the study of decorative painting (applause). The studentship was open to competition by students between the ages of twenty and thirty-five, belonging to any recognised School of Art, or other institution for the study of applied art, &c., within the limits of the larger metropolitan postal area. The rules were somewhat lengthy, but any student desirous of entering could obtain full information on application to the secretary. It appeared, however, that architectural decoration was completely within the scope of this studentship, and he hoped some of the younger members of the profession would compete (applause). He had also been asked to intimate that the Worshipful Company of Carpenters had arranged a course of six lectures on matters connected with building, to be delivered at Carpenters' Hall, London-wall, commencing on the 6th of February, at eight o'clock. Admission would be by tickets, which could be had free on application.

The President, Mr. Alfred Waterhouse, R.A., then delivered the following address to students:—Gentlemen: Though I cannot long continue to take an active part in the profession upon which you as students are just entering with all the enthusiasm and hope which belong to your years, I have a very lively remembrance of my own early endeavours to make an architect of myself, and of the blind and uncertain fashion in which I blundered on my way. Your path is, comparatively, a clear one. You know what books to read; what buildings to study; what lectures to attend. You are working towards a definite end, and have the goal well in view. Our profession is a hard one. Let nobody think of it for himself, who is not prepared for work, and plenty of it. But the practical study of architecture is a noble pursuit, and full of intense interest. You will be called upon to write your country's current history in brick and stone. It will be for you to tell to future centuries what have been the thoughts and aspirations of the English race in the latter end of the nineteenth and the early part of the twentieth centuries of our era. How are you going to set about this task? Your art must be your own, but your buildings must faithfully adapt them-

selves to those for whom you build,—must embody their requirements, and give what they want, in the most direct way possible. Do not let the conventionalities of style interfere with this. First find out exactly what is wanted. Never think about the elevations of your building till you have ascertained this, and embodied it in your plans as fully and as perfectly as you can. Afterwards clothe the building so planned in the most fitting dress you can devise. That dress may be in many cases extremely simple, in others ornate; it may have to be sometimes severe, sometimes of exquisite beauty, if you can make it so. As you have in the first instance been solicitous that your building should adapt itself in every way to the needs and condition of the people who are to use it, so now strive that every detail of the dress in which you clothe it shall help to make its purpose clear. The architect who by over-elaboration disregards this rule is much more surely self-convicted of bad work than he who errs on the side of simplicity—as that may arise from want of means, which is to no artist a discredit (applause).

In commencing practice for yourselves, you will doubtless more or less rely, many of you, on competitions. I, therefore, propose to speak of competitions on this occasion. The evils of them are numberless. It is doubtful whether they often result in the best building being erected for the purpose in view, and there is no doubt that they are sometimes a fearful waste of the ingenuity and resources of the profession. On the other hand, they are often the young architect's opportunity. He might, if friendless, have little chance of success without their aid. Let us endeavour to see how we may, to a certain extent, make use of them, so as to prevent their being a too great waste of our time and thought.

No one would be insane enough to enter upon one of these laborious contests if he did not see before him a prospect, if the victor, of erecting a successful building; and, therefore, it is of the utmost consequence to you that, before seriously setting to work, you should ascertain that the promoters intend in all good faith to build. There have been instances in which it seemed as though competitions were only resorted to in order to show the promoters what they wanted, and to tell them how much their building would be likely to cost; and then, when, after a superficial examination of the designs sent in, it is found that the scheme does not altogether commend itself on paper, and when the public objects to the necessary outlay, the miserable premiums are paid, and the whole project is allowed to drop into oblivion. That is not the sort of competition I recommend you to embark in. If the promoters pledged themselves that, were the work not begun before a certain time, they would pay the successful competitor at least the amount of his commission, it would be a guarantee of fair play; and this, when a competition falls through, is, I think, standing shoulder to shoulder, the least we should demand. Before, therefore, you enter the lists, be as sure as you can be that the promoters mean building (applause).

Reject with scorn offers which are an insult to the profession. I have heard of a competition for a drinking-fountain to cost 600*l.*; a premium of 20*l.* to be given to the successful artist, and 10*l.* to be added to it if the design be carried out under his superintendence. Do not let people trade to such an extent on your laudable desire to become known as artists and earn distinction. The commission alone for such a work ought not to be less than 10 per cent. on the outlay, and proper premiums should be awarded in addition.

Much has been done by this Institute, and by the Committee appointed for the purpose, to guard against the abuses formerly attendant on competitions. Most architects have agreed not to engage in these ventures unless an assessor or assessors be appointed in whom they can have confidence, to ensure them against favouritism, and against the merits of their designs being, through incapacity or inadvertence, overlooked. That is a great step in the right direction. The responsibilities of the assessor are enormous; and in order that he should take the promoters with him so as to secure the loyal acceptance of his award or recommendation, I have found it most desirable that he should discuss the different designs with them,—not that he should take his cue from their opinion, but that they should clearly understand upon what

foundation his conclusions are based. A grave responsibility also rests on those who draw up your instructions. They should be clear, and if they be not clear, it is better you should speedily write for further information; above all, they should not insist on non-essentials. Many an excellent design has been set aside merely for doing what obviously ought to be done, but thereby transgressing unwisely-strict instructions. When the designs come in, the mistake in the instructions may be clear enough; yet the assessor and promoters have no alternative but to adhere rigidly to them in making their award (hear, hear).

It would be well if competitors would endeavour, in imagination, to put themselves in the place of the assessor. His first operation is usually to find out what designs have been implicitly conformed to the instructions, and what have not (hear, hear). The latter, whatever their intrinsic merits may be, he puts aside. They are at once and for ever out of the competition. This may appear a harsh measure in some instances, and the promoters may be distinctly the losers by the process; but, having issued definite instructions, there is, of course, nothing for it but seeing that the designs selected adhere strictly to those instructions (hear, hear). For instance, I have known nearly twice as much accommodation demanded on one floor as on another of equal area, and an excellent design,—far better than that selected,—excluded because a part of the accommodation was put upon a different floor from that on which it was specified to be put,—in no way, that I could see, to the detriment of the scheme. I mention this to you, not because you may have much voice in the matter, but to show the danger of ignoring the line which assessors may be compelled to follow.

Probably the next step the assessor will take, after discovering and putting by themselves those designs which do not adhere to the instructions, will be to take note of those in which there are evidences of false or careless construction. He will probably find some in which the staircases will not carry the occupants of the building to the storey above, or will not do so without their heads coming in contact with the gallery or landing overhead as they ascend the stairs. This is not uncommonly the case even in ambitious designs. Chimney-breasts also frequently make strange vagaries in their way from floor to floor, finding themselves at a distance of many feet, measuring horizontally, from where they were on the floor below, perhaps because the rooms they serve have to be of different superficies on one storey from what they have to be on another. These testify to carelessness or to something worse, and the assessor is bound to make notes of such defects, and to let them tell against the designs in question.

When, therefore, he has got together the designs which conform to the instructions, and which are honest and careful in construction, he finds perhaps that they are, after all, but few as compared with the number which originally confronted him; and it is on the former that he has to exercise his judgment, weighing their merits and defects of plan, lighting, fitness for the purpose to which the structure is to be devoted, beauty in proportion and detail,—in a word, their general excellence.

It is always best, I think, as I have already said, not to allow your elevations to claim attention before your plans. Arrange your accommodation, therefore, to the best advantage in the first place, and do not give your plan a moment's peace until you have secured a perfect arrangement. Get every room exactly where it should be with regard to every other room, of a proportion pleasing in itself, and suited to the use to which the room is to be put. A double cube,—that 2 by 1 by 1 high,—may be a fit proportion for a legislative chamber such as the House of Lords; but an ordinary room would be better 2 by 3 by 11 high, or 3 by 4 by 2 high. The smaller the room the nearer its length and breadth must approach in dimensions, and the higher must be its comparative height: as 5 by 6 by 14 high, which multiplied by 3 is 16 by 18 by 12 ft. high. Think of yourself as an occupant of each room, and put doors, windows, and fireplaces as you would like them to be for your own use and convenience. Let every room be approached by direct, well-lighted corridors and staircases, as broad as the occasion requires, and no broader; for it is as great a fault to throw space away uselessly,—



that is to say, when neither needed for convenience nor effect,—as it is to be without it where it is required for these purposes (hear, hear). Nothing so much spoils an otherwise good plan as ill-arranged corridors. They are the parts of the building seen by everybody who enters the building, and,—though I have begged you to arrange your plan before your elevation, because in all ordinary structures use must come before beauty,—I should recommend your picturing your corridors to yourself from the very beginning of your studies of the plan. The parts of the corridor most seen are, of course, its ends; and if a studied arrangement is wanted anywhere, it is at those points of your design which are directly before the eyes of everybody passing to and fro. The Gothic builders understood this, for the aisles of most of their churches terminated in a beautiful window filled with stained glass, designed to be seen at a distance. The end of a vista, however you may determine to treat it,—with window, door, arcade, statuary, or otherwise,—should not only receive your most careful study, but, if possible, you should arrange that, except when occupied by a window, the light should fall more strongly on this termination of the corridor than on intermediate parts. Nor should these latter escape your attention. They should be everywhere well-lighted, but not monotonously so. Remember, that architectural effect, where you do not trust to polychromy, depends entirely on the skilful contrast of light and shade. In the admission of your daylight and the arrangement of your artificial light, the most exquisite detail is entirely thrown away if you contrive to deprive your building of all shade. A very simple passage divided by arches into bays always looks well, if only the alternate bays be lighted; while the effect is greatly diminished by introducing windows and gaslights into each bay. Again, it is desirable to keep your brightest lights for the apartments, staircases, and other parts which you dignify with your most elaborate efforts, and to those rooms where the brightest light is essential, which will appear all the brighter if the way to them be kept in subdued light. I am bound to say, however, that though I am convinced of this being one of the great secrets of the successful treatment of interiors, such is the horror of gloom in the public mind, at present, that the rule should be applied with caution, or those who come after you may let light in where you never intended it,—in fact, may light up brilliantly your more uncomely parts, and make shipwreck of your studied effect. I may instance from my own experience an illustration of this. The upper part of the open-amber roof of a great hall was roughly framed, and intended to be barely visible in the gloom; but my friends and clients declared I had overdone the obscurity, and so inserted former windows among the carpentry of the roof, and exposed its leanness (laughter). Let the fancied requirements of the style in which you are designing induce you either to put your windows in the wrong place with regard to the bellings and floors, to omit them where required, or to put in sham windows from a supposed need for symmetry. There are instances of hemi-circular windows being brought down close to the floor, and kept many feet from the ceiling, in buildings of pretension. If a competitor were to adopt such a treatment for other than store or lumber rooms, it might go hard with him before some assessors.

There are hanging round the room photographs of the premiated designs in the recent competition for a new front to the Cathedral of Milan. Perhaps you will agree with me in my preference for the work of our fellow-countryman, Mr. Brade, particularly if you examine the design on its own merits, without special reference to the conditions of the problem. It has a masculine vigour and severe beauty about it which removes it far from the rest of the designs. The jury,—that is, the judges of the designs,—had, however, previously decided by a great majority that the characteristics of the existing building, and the phases of its construction, should be emphasised in the designs sent in for the second competition. They, therefore, took exception to the perpetuation in Mr. Brade's second design of the horizontal lines which characterised his first sketches. I merely mention this as again another instance of how absolutely necessary it is to be guided by your instructions if you intend to compete, even if those instructions go against your individual judgment,—which may

possibly be sometimes better than that of your judges.

In recasting the façade it became necessary to remove the three Renaissance portals and the windows above them, designed by Pellegrini, afterwards architect of the Escorial. These features, I fancy, most people regard as the best portion of the existing work (hear, hear). One of the competitors gave not only his notion of the way in which the front should be treated so as to marry with the rest of the edifice, but by designing a detached Renaissance campanile, to the south-west of the Duomo, just opposite the entrance to the recently-built *galleria*,—or, as we should term it, arcade,—he showed how these beautiful features of Pellegrini and his successors could all be worked in again in an erection of the same style as the *galleria*: and how the campanile, by serving as a pendant to the arcade, would prevent its enormous size appearing to crush the Duomo as it does at present. This work of Signor Beltrami was beyond the instructions, but did not in any way contravene them. It was therefore thought that it might be mentioned with the favour it deserved in the report of the jurors.

I would sum up what I have to say about competitions by calling your attention to the opportunity they present for the practise of the most scrupulous honesty. The architect must, of course, live in an honest atmosphere (hear, hear). He must remember that his drawings are but means to an end; that their sole purpose is to delineate as accurately as possible his buildings if erected. He will, therefore, not allow his design to give an appearance of detail he does not intend to realise. His perspective views will show his building as it actually will appear from a given point, the more distant parts not being raised up unduly to show well above the nearer features. He must suppress nothing, exaggerate nothing. The cubic contents must be accurately given, the prices attached reasonable prices. You must not think I am merely taking the low standard of "Honesty being the best policy." That may be quite true. I believe it is. But what I would urge is the extreme importance of the architect breathing the air of accuracy, so that all his works may be transparently truthful, that he may neither deceive himself nor other people (applause).

I fear I have wearied you by saying so much about competitions, but much of what I have said about them is, I believe, equally true of general practice. The conditions of most competitions now demand one or more perspective views,—and very wisely so too. The architect himself does not know exactly how his building will look from a certain point until he has drawn it in perspective. Accustom yourselves to design in perspective. The English method in this respect is, in my humble judgment, far away above the ordinary French way, in which, as a rule, the perspective drawing is omitted. Both inside your building and without always try to be realising the effects you will be likely to produce from given points. While making your plans, think of the roofs, and arrange the walls, where possible, so that your roof may be simple, strong, inexpensive, and effective. For the English architect, owing to our sad climate, there is nothing more important in point of effect than the sky-line, which should always be on that account most carefully studied.

When I gave the usual address from this chair in November last, I did not know that I should have the pleasure of speaking to you, the students, to-night. I then said something on the study of ancient examples being as thorough and exhaustive as possible, and of the immense facility and quickening of the observing powers which drawing from memory would give the student, which I now feel would have been better said to you direct this evening; but I will not go over that ground again, though I would urge you to give the system a fair trial.

Having made an exhaustive study of a few ancient examples of repute, so as to familiarise yourselves with the intentions and mode of work adopted by their builders, I would impress upon you the necessity of the most careful study of your own work, thinking no time lost which you may devote to its refinement and improvement. I believe this is what we want, rather than so much of our strength being devoted to antiquarian researches (applause). I suppose the most perfect buildings the world has ever seen were the Greek temples and Propylæa. It is well you should be familiar with their details and proportions; but it is

even more important that you should remember that this astonishing result of human effort was the work of many generations, many centuries, in which the builders gave themselves over heart and soul to the work in hand; and so far as we know, when their style had once taken its distinctive features, they did not much trouble themselves about what had been done in other ages and other climes. The same may be said of the mediæval builders; they concerned themselves with their own work, with the most stupendous results. It does not seem to me of much consequence what the style may be which we select as our starting-point. When I was young we were hoping that the Gothic of about the year 1200 would have met with general approbation. Of late years a free treatment of Renaissance has found more favour. That style will, no doubt, answer well if you will but stick to it while it grows under your fostering care. The gardener who is constantly throwing away his transplanted trees in order to put fresh ones of a different kind in their place is not likely to see much good result of his labours. And if we are ever to see a living architecture growing up in our midst we must be of one mind as to our style, and we must determine, each of us, to furnish our quota to the development of our art, not by aiming at startling effects, but by giving to our work, our best, most refined, most earnest thought (loud applause).

Mr. Macvicar Anderson, at the close of the address, said: I am sure every student present must have listened with the greatest possible interest to the most practical and able remarks which have fallen from the lips of our President (applause), and I think I am only interpreting your wishes when I thank him for his kindness in having delivered the address which it has been your privilege and, I think I may be permitted to say, our privilege, to listen to (applause). We will now proceed to the agreeable duty which the President will have to fulfil, viz., of making the presentations to the students. I hope I may be permitted, in a word, to take the opportunity, as there are a large number of students present, to assure them that among the arduous and difficult duties,—far more arduous and difficult than some may think,—that devolve upon the members of the Council, nothing affords them more real pleasure or delight than doing everything that lies in their power to promote and encourage the studies of the younger members of the profession (applause). I do not want you to suppose for a moment that we look upon ourselves as pieces of antiquity left upon the shelf; but, at the same time, we do know what your difficulties are, having passed through them, and are, therefore, able to sympathise with you in your difficulties, to make every allowance in judging of your failures, and to congratulate you upon your successes (applause).

The President then made the following presentations, most of the successful competitors being present:—

The Asphitel Prize, 1888, given to the candidate who distinguished himself most highly in every branch of the different examinations held during one year, was presented to Mr. Henry Ernest Stelfox, Associate (Manchester). The Prize consisted of books of the value of 10*l.* 10*s.* Further prizes of books to the value of 5*l.* 5*s.* were gained by Mr. Paul Waterhouse, M.A. (Oxon. (Institute Medallist)), and Mr. Henry William Burrows.

The Scientific Masonry Prize, 1888, given in connexion with Mr. Lawrence Harvey's class, and of the value of 10*l.* 10*s.*, was gained by Mr. A. Findlay, who had worked as a mason at Dundee, and earned his living in the same way ever since. A letter from Mr. Harvey referred to Mr. Findlay's extraordinary capacity for arithmetical calculations, and congratulated the Institute on having brought him out. The second prize was gained by Mr. Andrew Whitford Anderson, Associate (Institute Medallist); and honourable mentions by Messrs. Day, Lancaster, Ayling, Luck, Sargent, and Gubb.

The Pugin Travelling Studentship, 1888, consisting of the Pugin Medal and 40*l.*, were won by Mr. Roland Wilmot Paul, and the President in handing the cheque congratulated Mr. Paul on his most exquisite drawings.

The Godwin Bursar for 1888, Mr. Francis Hooper, and the winner of the Owen-Jones Travelling Studentship, 1888, Mr. Gerald Callcott Horsley, were also received and congratulated by the President.

The following presentations were next made, in accordance with awards made at the meeting



of January 17, Mr. Anderson saying that he hoped they would appreciate the change which had been made in bringing the awards and presentations so close together (applause).

The Pugin Travelling Studentship, 1889, was awarded to Mr. Charles Edward Mallows; and Medals of Merit to Mr. John Begg (Edinburgh) and Mr. Ernest William Gimson (Leicester).

The Godwin Bursary, 1889, was awarded to Mr. Frank Stephen Granger, M.A. Lond., Associate (Nottingham).

The Owen-Jones Travelling Studentship, 1889, was gained by Mr. Henry Vaughan Lancaster, and a Medal of Merit by Mr. Francis Edward Massey.

The Tite Prize (30*l.* and a certificate) fell to Mr. Francis Thomas Verity, and a Medal of Merit to Mr. Edward Boehmer (Philadelphia, U.S.A.).

The Soane Medallion and 50*l.* were awarded to Mr. Arthur Sykes, Associate, and a Medal of Merit to Mr. George Kenyon (Edinburgh).

The Institute Silver Medal and ten guineas for measured drawings were gained by Mr. Percy King Allen (Nottingham), while a Medal of Merit and five guineas fell to Mr. Francis William Troup.

The Institute Silver Medal and twenty-five guineas for the best essay upon a given subject were taken by Mr. Percy Scott Worthington, B.A. Oxon. Mr. Worthington is the son of Mr. Thomas Worthington (Vice-President), who, as stated by Mr. Octavius Hansard, won the same prize forty years ago. Medals of Merit in this competition fell to Messrs. Frederick William Marks, Associate (Sydney, N.S.W.), John Arthur Marshall, and Ambrose Macdonald Poynter.

The President then said,—I should like to say, before we separate, that we congratulate the victors on their success, but we have not told those who have just not succeeded how much we sympathise with them. Some of them have run the victors very close, and I should like to say that my own impression is that they have not lost so very much by not getting a prize. After all they have had the work, and that is the great thing (laughter and applause). The work is the thing after all, and it is that which induces you to spend your time in labours which will go for something instead of frittering it away. You are all gainers in that way, whether you take the prize or not, and I think you must remember that after all the race is not to the brilliant so much as to the persevering; and if you do not succeed this year, in all probability, if you go at it with vigour, you may succeed next year or the year after (applause). I have to announce that the next meeting will take place on the 11th of February, when a paper will be read by Sir Richard Temple, Bart., M.P., formerly Lieut.-Governor of Bengal, on "The Application of Art to Architecture, Indian and Other."

Mr. Ewan Christian said he was not sure whether a vote of thanks to the President had been formally moved by Mr. Anderson. If not, he had much pleasure in moving one.

Mr. Charles Barry seconded the motion, which was carried by acclamation, and the proceedings terminated.

#### THE SURVEYORS' INSTITUTION: STUDENTS' PRELIMINARY EXAMINATION, 1889.

Of the fifty candidates who presented themselves at the examination, held in London and Manchester on the 22nd and 23rd of January, the following satisfied the Examiners:—

Arnold, Arthur Harris  
Bancroft, Frederick H.  
Bertwistle, Arthur  
Bowden, Ernest N.  
Brinkworth, Robert E.  
Brooke, John C.  
Buckland, Sidney C.  
Cooper, John H., Jun.  
Debenham, Hugh  
Eager, Edward H.  
Finn, Herbert A.  
Fleetwood, George S.  
Foster, James H. F.  
Franklin, Benjamin B.  
Gailey, James H.  
Garrod, Arthur E.  
Green, Alexander E.  
Green, Edmund H.  
Halford, Alfred  
Harrison, John E.

Hedger, Ralph W. A.  
Hulbert, Frank  
Lake, Vivian D.  
Leaning, William A.  
Long, Edgar W.  
Merry, Arthur W.  
Morris, Richard P.  
Nice, George S.  
Palmer, Philip S. M.  
Petty, William P.  
Potter, Herbert G.  
Robins, Philip S.  
Robinson, Shirley H.  
Rogers, Percy W.  
Scrutton, Claude A.  
Thirtle, John  
Tuckett, Percival F.  
Watson, Claude H.  
Webster, Hugh C.  
Windley, Henry C.

\* Passed at head of list.

#### THE INSTITUTE OF BUILDERS.

The fifth annual general meeting of this Institute was held at the offices, 31, Bedford-street, Strand, W.C., on Thursday, January 24. The chair was taken by Mr. Frank May, a Vice-President, in the absence, through illness, of the President, Mr. George Burt, D.L., J.P. The Secretary, Mr. Richard S. Henshaw, read the following report of the Council for the past year:—

1. The Council are pleased, in presenting their Fifth Annual Report, to be able to state that there has been a further increase in the number of members during the past year, but they record with great regret the death of their much-esteemed colleague, Mr. Thomas Patrick.

2. The unusual number of Bills before Parliament during the past year induced the Council to appoint a committee to deal with them as they came before the House, but the action taken with reference to the Employers' Liability Bill being so important, a Joint Parliamentary Committee, representing the Institute of Builders, the Central Association of Master Builders of London, and the National Association of Master Builders of Great Britain was formed, consisting of the following:—Mr. Ashby, London; Mr. Bartlett, London; Mr. Bird, London; Mr. Burt, London; Mr. Colls, London; Mr. Cowlin, Bristol; Mr. Dove, London; Mr. Dennett, Nottingham; Mr. Jones, Liverpool; Mr. May, London; Mr. Neill, Manchester; Mr. Nicholson, Leeds; Mr. Rider, London; Mr. White, Liverpool.

3. This committee held several meetings, and after some correspondence the Home Secretary received a deputation, consisting of Messrs. Ashby, Bartlett, Bird, Burt, Maton (solicitor), and R. S. Henshaw (secretary). The Bill, however, as revised by the Grand Committee on Law, met with great opposition by the representatives of the Trades Unions in the House of Commons, on the ground that it did not go far enough in the interest of the working men, and the Government withdrew the Bill, and renewed the Act of 1880 for another year.

4. The Bill for the Sanitary Registration of Buildings has not again been brought before Parliament.

5. The meeting which the Council stated in their last Report they hoped to bring about to discuss the "Non-acceptance of the Lowest Tender," has not yet been arranged.

6. The decision in the case of Priestley v. Stone having been brought to the notice of the Council, as seriously affecting the trade in its relation with quantity surveyors, a committee has been appointed to confer with the Surveyor's Institution and others on the question, and the Council hope that they will soon be able to report that a practical solution of the difficulty has been arrived at.

7. The quantities and form of tender issued on behalf of the Committee of the Fourth Middlesex Asylum were considered by the Council to be inequitable in many points; they communicated their views to those who were invited to tender and warned them of the risks involved.

8. The Council gratefully acknowledge the handsome gift by the President to the Institute of a gold badge (consisting of the arms of the Institute), for which they have tendered to him, on behalf of the members, a cordial vote of thanks.

9. During the year the members had the opportunity, through the kindness of the President, of visiting the Outfall Works at Barking, and were subsequently entertained by him at a banquet, at Greenwich.

10. The Council are indebted to Mr. F. J. Dove and Mr. H. T. Ashby for the valuable and interesting papers read by them at the Institute during the year, and hope that others will also come forward.

11. The Council desire to express their thanks to the Royal Institute of British Architects and other friends who have during the past year presented pictures and books to the Institute.

12. Audited accounts of the funds of the Institute, and of the Library and Benevolent Funds, for the past year, have been prepared for the information of members.

13. In accordance with the Articles of Association the President, Mr. Geo. Burt; one of the Vice-Presidents, Mr. T. F. Rider; the Treasurer, Mr. George Plucknett; one of the Auditors, Mr. George Burt, Jun.; and four members of the Council, Mr. J. Howard Colls, Mr. Woodman Hill, Mr. Robert Neill, Jun., and Mr. J. H. Trollope, retire, but are eligible for re-election. The meeting will also have to elect a member to fill the vacancy caused by the death of Mr. Thomas Patrick, and the Council recommend Mr. Joseph Randall.

On the motion of the Chairman, the report was received and adopted; and Mr. Frank May, J.P., was unanimously elected President for the ensuing year. Mr. Thomas F. Rider and Mr. Herbert H. Bartlett were re-elected and elected respectively Vice-Presidents; Mr. George Plucknett, J.P., was re-elected Treasurer; Mr. J. Howard Colls, Mr. Woodman Hill, Mr. Robt. Neill, junr., and Mr. J. H. Trollope were re-elected, and Mr. Joseph Randall and Mr. W. H. Clarke were

elected, on the Council; Mr. George Burt, junr., being re-elected one of the auditors.

A vote of thanks to Mr. George Burt for his services as President during the past year, and to the Chairman for presiding over the meeting, concluded the proceedings.

#### NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

The National Association of Master Builders of Great Britain held its twenty-second half-yearly meeting on Wednesday, the 23rd ult., at the Albion Hotel, Piccadilly, Manchester, Mr. Robert Neill, junr., in the chair, and representatives from London, Liverpool, Manchester, Birmingham, Leeds, Hull, Bradford, Salford, Bolton, Wigan, Oldham, Stalybridge, and Lancaster, were present.

The report and accounts for the past half-year were adopted.

Mr. J. H. Colls, of London, was appointed President for the ensuing year; Mr. Robert Dennett, of Nottingham, senior vice-president; Mr. J. C. White, Liverpool, junior vice-president; Mr. Stanley G. Bird, London; Mr. W. H. Cowlin, Bristol; and Mr. Robert Neill, junr., of Manchester, were appointed hon. vice-presidents; Mr. J. S. Jones, of Liverpool, honorary treasurer; Mr. C. W. Green, of Liverpool, honorary auditor; and the following were appointed members of the council:—

Birmingham, Messrs. John Bowen and W. Sapcote. Bolton, Mr. Jos. Hy. Marsden. Bradford, Messrs. Wm. Moulson and Wm. Holdsworth. Bristol, Mr. A. Krauss. Edinburgh, Mr. Thomas Bonnar. Glasgow, Mr. R. Anderson. Hull, Mr. R. Bevers. Lancaster, Mr. Wm. Huntington. Leeds, Mr. C. Tomlinson. Lincoln, Mr. Wm. Hy. Close. Liverpool, Messrs. C. W. Green and Chas. Tomkinson. London, Mr. Thos. Rider. Manchester, Messrs. Wm. Southern and Wm. Brown. Northampton, Mr. W. H. Smith. Nottingham, Mr. Enoch Hind. St. Helens, Mr. R. Belsler. Wigan, Mr. Chas. B. Holmes. Wolverhampton, Mr. J. Bradney.

A Parliamentary Committee was appointed to watch all matters of legislation that may be brought into the House of Parliament during the ensuing year.

A committee, consisting of the President, Mr. Robt. Neill, junr., Mr. J. C. White, and Mr. J. S. Jones, was appointed to deal with the question of the form of contract and the question of quantities.

It was resolved to hold the next half-yearly meeting at Hull.

In the evening the members attending the meeting were entertained to a banquet by the members of the Manchester Association.

#### LONDON, ANCIENT AND MODERN, FROM A SANITARY POINT OF VIEW.

THIS was the title of a lecture delivered at the Sanitary Institute on January 24th by Dr. G. V. Poore.

Dr. Poore began by reminding his hearers that the mere age of London was one of the reasons why it became unwholesome. Roman London was buried deeply amongst rubbish of all kinds, much of which was putrescible, and therefore a source of danger in the soil.

London was well placed and magnificently supplied with water, for in addition to the Thames there were many streams,—such as Westbourne, Tybourne, the Fleet River, Walbrook, and Langbourne, which originally were sources of pure water. All these brooks, however, had become disgracefully fouled, and for very shame had been covered over. One great drawback to the site of London was the proximity of marshy land on every side except the north-west, and formerly from this cause malarial fever and dysentery were great causes of the high death-rate.

In Mediaeval London, and even down to the eighteenth century, the houses were not so closely packed as they are now. Reference to Agassiz's map (time of Elizabeth) would show that there was a great deal of garden-ground within the City, and on comparing this map with Newcourt's map (Charles II.) it was evident that just before the Plague and the Fire the crowding of houses had become very much greater than it was in the time of the Tudor monarchs, who discouraged building near or in London.

Parker's map (1720) would also show that after the Fire the houses were not so closely



packed as in the days of the Stuarts, for in this map a surprising amount of garden-ground is visible within the walls. At this time also Moorfields was not built upon, and remained as playground and air space, as it had done for centuries previously. That Medieval London was very unhealthy, a perfect fever-den, there could be no doubt. The Black Death in 1349, and the Sweating Sickness two centuries later, were times of great mortality which struck the popular mind, but it was not till 1593, when bills of mortality were first introduced, that we began to have any certain knowledge of the amount of the kind of disease prevalent. There was reason to think, however, that in the eighteenth century (after the Fire and the great Plague) the deaths exceeded the births by about 600,000 in the hundred years.

The fatal diseases were mainly fevers—malaria fever, small-pox, typhus, measles, and (later) whooping-cough. The causes of the enormous mortality of Medieval London were:—1. To the marshy, undrained soil, fouled with refuse of every kind. 2. The filthy state of the unpaved city, and a perfectly swinish condition of the houses of the lower orders. 3. The ill-nourished and drunken condition of the masses, among whom a taint of scurvy was very common. 4. The condition of superintendence and brutality (as evidenced by the punishments and the pastimes) which made any measures of public health impracticable. The management of epidemics was bad, with total neglect to separate the sick from the sound; and, finally, the medical faculty were barely less ignorant and superstitious than their patients.

Turning to modern London, the lecturer said there had been a great and manifest improvement, but when we looked at the low figure which is called the London death-rate, several things must be taken into consideration, *eg.*, 1. The London of the Registrar-General included large districts such as Lewisham, Wandsworth, Fulham, &c., which, in great part, were scarcely urban in character; and these being occupied largely by well-to-do persons, lowered the average death-rate for the whole city. 2. London being a city in which wealthy people abounded, its death-rate must not, in fairness, be compared to a city packed with diluted operatives. 3. The mobility of the population was so great at this fact must vitiate our statistics, and it is to be remembered that nothing quickened the departure of an individual from London more than ill-health.

4. The age distribution in London was very normal. It was largely recruited by selected youths from the country, and there was a great deficit in the extreme ages among which (the young and very old) death-rate is always highest. 5. Again, the diminishing birth-rate (that for 87 was 2·8 below the average of the previous 10 years) very greatly diminished the death-rate in a city where 158 children out of every 1000 born die before they are one year old.

It was difficult to believe that Londoners were very robust when more than 25 per cent. of them had recourse to the public hospitals in the course of the year.

The cause of the diminished death-rate (which was very considerably reduced after every allowance had been made) was due—

1. To the increase of knowledge, not only among doctors, but amongst the people generally, for we must remember that "self-preservation is the first law of Nature."

2. Vaccination, and the modern plan of treating infectious diseases by the prompt separation of the patients, had done a great deal; the total absence of small-pox and typhus were mainly due to these causes.

3. The cheapness of food, clothing, and fuel, &c. of course, diminished the tendency to disease, and the ease with which fresh fruit and vegetables were to be got had abolished the faint of scurvy which was so fatal to our ancestors.

4. The water-supply had been improved, and the intake of the water companies was now moved to a portion of the river less tainted with sewage than that formerly in use.

5. Although the system of sewage disposal is an undoubted evil, and had given us three or four epidemics of cholera, and was the mother of typhoid, still it was probable that so far the balance for good was in its favour, because it had removed a good deal of filth from dwellings.

6. The outlook in the future was dashed by the considerations.

1. Our system of sewerage and water-supply had increased overcrowding by enabling us to build houses of any height without inconvenience to the occupant, and without any outillage whatever, and since all sanitarians recognised that overcrowding was the greatest of all sanitary evils, it was impossible to shut one's eyes to this danger.

2. There was an expensive and menacing "loose end" to our sanitation in the shape of 150,000,000 gallons of sewage pouring into the Thames every day. The only proper destination of organic refuse was the soil, and it was not possible to see the end of the gigantic blunder we had committed in throwing it into the water.

3. The rapid increase of population along the valley of the Thames, where sewage disposal is on the same lines as in London, must make us apprehensive for our water-supply, because the various tricks played with sewage in the shape of precipitations, &c., were not probably of a kind to make the effluent a desirable or a wholesome beverage. If the evil effects of free trade are to be counteracted it will be by returning the refuse of our towns free of cost to the impoverished agriculturist. "If we go on as we are going," said the lecturer, in conclusion, "and if our brethren in the Colonies follow our bad example, as they appear to be doing, it will be a Chinaman rather than a visitor from New Zealand who will sit in contemplation on the ruins of London Bridge."

#### CASE UNDER THE METROPOLITAN BUILDING ACT.

At the Hammersmith Police-court, before Mr. Curtis Bennett, Messrs. John Barker & Co., of High-street, Kensington, were summoned by the Metropolitan Board of Works for unlawfully erecting on the side of Ball-street, Kensington (the same being a new street), of a less width than fifty feet, a building which exceeded in height the distance from the external wall or front of such building to the opposite side of such street without the consent in writing of the Board, contrary to section 85 of 25 and 26 Vic., cap. 102.

Mr. Thos. Burton, solicitor, appeared for the Board, and Mr. Bealey for the defendants. The facts of the case were as follows:—The defendants had erected buildings in High-street, Young-street, and Ball-street, Kensington, and the building complained of had a frontage in Young-street, and flanked to the extent of 59 ft. into Ball-street, such street being 45 ft. wide at one part and 42 ft. opposite the buildings complained of. The building was 53 ft. in height, being 11 ft. in excess of that allowed by the Act of Parliament. A plan of the street was then about to be put in evidence, when Mr. Bealey objected to its reception, and Mr. Bennett adjourned the case to the 29th of January for further evidence as to the laying out of the street.

Upon the adjourned hearing, Mr. Burton called Richard Tuck, who proved that he had been in the employ of the Board since 1859; that he superintended the laying out of the street in 1868; that the ground then was quite cleared; that he had inspected the street so laid out, and identified it as Ball-street.

Mr. Bealey said he should contend that the defendants were not liable, as the case of Lord Auckland and the Westminster Board, as also Barlow and the Vestry of Kensington, applied to this case, and also that there had been a building upon the site 48 ft. 6 in. high, and he called evidence in support of this.

Mr. Bennett said he would allow the building to stand up to 48 ft. 6 in. high, but the excess must be taken off, and he would adjourn the summons until Feb. 12 to see if this was done.

#### QUANTITIES.

SIR,—In a former communication to the *Builder* (Sept. 1, 1888), I suggested that one of the corporate bodies connected with the profession should enrol the names of surveyors willing to sign a declaration, in clear and precise language, as to their responsibility.

The corporate body so enrolling should have full power, by their Council, to strike off the names of any subscribers who, in their opinion, contravened the *bona fides* of such declaration.

There appears to be rather a prevalent idea that "Quantities should be made part of the contract," and at first sight this appears to be an equitable proceeding. In practice, however, it would be found to be one-sided, and would place the building-owner in a disadvantageous position.

When a building-owner enters into a contract for a lump sum, he expects that contract will be fulfilled in its completeness, so that he may

ensure a complete building for the contract price. In this, however, he would be disappointed if the quantities prove to be deficient in any material degree, and it would soon be made plain to him that he must pay the extra cost to the contractor, however great the surprise to him might be.

It is true the building-owner might have his remedy against the surveyor for want of due skill and care; but here fresh difficulties might be in store for him, and he would probably find that, although the case was clear between himself and the contractor, it was by no means so clear that he could recover the amount from the surveyor, who might, perhaps, fairly plead that he had performed his duty, so far as the proper interpretation of the drawings was concerned, and was, therefore, not responsible for the difference in quantity of material between that taken in his quantities, and that actually used in the building. No building-owner, who first counts the cost, should be placed in this position.

The building-owner would also be placed in a false position by reason of his inability to ascertain if any excess of quantity existed, unless he employed a surveyor to go through the whole with that view. The contractor, on the other hand, cannot very well fail to discover if there be any deficiency; he finds whereas the quantity of brickwork given would only require a certain number of bricks, he has used a much greater number, and so on with other materials.

If quantities were made part of the contract, it would act as a soporific on the surveyor, whose responsibility to the contractor would cease, and he would soon find his rate of commission would vary with his responsibility.

It has been further suggested that surveyors should guarantee the *correctness* of their quantities. This, again, at first sight, seems fair, but it would much increase their existing responsibility.

Suppose there are two errors, one in excess, the other in deficiency, and that it happens each is of equal value, it could scarcely be said the quantities were *correct*, although, in the result, they do no damage to any one.

In such case could not the contractor sue the surveyor for the deficiency, and the building-owner sue him for the excess? Could the surveyor support his guarantee of "correctness" by pleading another error? Would two wrongs make a right?

There seems no valid reason why a surveyor or any one else should accept a larger responsibility than the law imposes.

J. HAYWARD STUDDWICK.

Jan. 30, 1889.

#### INHABITED HOUSE DUTY REPEAL ASSOCIATION.

SIR,—Will you please insert in your next impression the annexed copy of a letter received from Lord Henry Brudenell Bruce, M.P., in reply to one from me requesting his lordship to move in the House of Commons a resolution of the Inhabited House Duty Repeal Association for altering, amending, and extending the various Acts relating thereto.

JOHN ROBERT WHORLOW, Secretary.  
Albert Mansions, Queen Victoria-street, E.C.

[Copy.]

36, Eaton-place, S.W.,

January 21st, 1889.

"MY DEAR SIR,—In reply to your letter, I will certainly give notice of a motion as regards the Inhabited House Duty directly Parliament re-assembles. I am glad indeed to hear that the subject will receive influential and adequate support. It is certainly high time it should, for I suppose there is no tax which has done more downright injury to the working-classes than this particular one. But what can the nation think of the consistency of our statesmen when we all know the tax has been condemned by the late Lord Beaconsfield, Mr. Gladstone, and Mr. Goschen to boot? You have a Land Tax. Why a House Tax besides? But to talk about taxation in this country is tantamount to committing rank heresy. So long as we tax ourselves, even our own produce (say, for instance, the London Coal dues), everything is *couleur de rose*; but the very moment there is a suspicion that you would like to make the foreigner take a small share of the heavy burden, especially when he is competing tooth and nail with the British taxpayer, you are looked upon as quite beyond the pale of civilisation, and unfitted any longer to be ranked as a serious politician.—I remain, yours very faithfully,

HENRY BRUDENELL BRUCE.

To J. R. Whorlow, Esq."



## THE LATE MR. E. N. CLIFTON.

SIR,—I have read in your last week's issue (p. 78) the letter from Mr. J. Drayton Wyatt, with reference to my father's early professional career.

I must confess I did not know there were two architects of the name of "Inwood." I have in my office a book of Inwood's Tables given to my father "with the author's compliments." "William" Inwood was the author of the tables, and from this and other facts I concluded that my father was related to him.

With regard to what Mr. Wyatt says about the new St. Pancras Church, I have always understood from my father that he was engaged on work in connexion with this church; he often referred to it, and also to the fact of terra-cotta being used for the first time in its construction as a building material. My impression with regard to the church is confirmed by Mr. W. E. Hope, my partner, who was associated with my father in business for over thirty-five years.

It is not easy to glean information always even as regards one's own father's early life; but, from the facts I had before me, confirmed as they were by friends both in business and private, I considered what I wrote was correct.

WILLIAM E. CLIFTON.

7, East India-avenue, E.C., Jan. 29.

## "THE BUILDERS' TECHNICAL AID INSTITUTE."

SIR,—In answer to your criticism in *The Builder* of the 26th inst., under "Notes," upon the Preliminary Prospectus of the "Builders' Technical Aid Institute," perhaps you will allow me the opportunity of putting before you as clearly and as briefly as possible some of the aims and objects of the Institute, and its relations to those whom it is designed to benefit.

The permanent prospectus, which I enclose you herewith, will, I trust, show you at a glance that this Institute should fill an every-day requirement of the smaller builders—equally to the contractor or speculator, though not necessarily the *jerry* builder. We believe that if greater facilities were put in the way of smaller builders (we must assume, of course, that the larger builders are in a better position to obtain the necessary assistance) there would be less causes for litigation, would facilitate the architect's duties generally, and render "jerry" building less excusable, if not more rare.

A perusal of the prospectus will show you that each department has been well thought out, both in the interests of the builder, the architect, and the building public generally, in order to give greater facilities for obtaining that expert technical knowledge which is essential in these days of eager competition. There, then, are the reasons for "setting this Institute on foot," and we have the very great satisfaction of knowing that many well-known builders are in sympathy with us, and that we have tangible evidence of appreciation in all parts of the country.

Just a word as to the paragraph to which you took exception, viz., as to our supplying builders with drawings. If it is, as you say, that architects are the "natural enemies" of the builder, I cannot see that we shall in any way be interfering with the profession by supplying our subscribers with properly-drawn-up plans, which will at least show them how they ought to build, even if they do not, as it is a well-known fact that by far the majority of buildings are erected without the assistance of the architect.

I trust you will give this letter space in your columns, in order to set aside any wrong impression that may have arisen from your comment.

Jan. 28.

HORACE F. JOYCE, Secretary.

**Estate Sale.**—Offers may be made up to March 1 next for the demesne portion, being nearly 1,400 acres, of the Castlemartyr Estate, county Cork. This property includes a large mansion, pleasure-grounds, and park of 814 acres, walled in; a deer park of about 400 acres, and a home farm with 180 acres; also walled fruit and vegetable gardens (8 acres), a heronry, together with water for boating, bathing, and fishing. Within this demesne stand the ruins of the ancient castle and church, and the vendors guarantee an indefeasible Parliamentary title to the purchaser. Castlemartyr, about eighteen miles eastwards of Cork, is on the river Maine; it was the seat of the Geraldines, and latterly of the Boyles, Earls of Shannon.

**Outfall Sewerage Works.**—The Outfall Local Board have decided to carry out a scheme of outfall sewers, with works for precipitation and land filtration of the sewage. Messrs. Brierley & Holt, of Blackburn and Manchester, have been appointed engineers to carry out the works.

Of the *jerry* builder, we said, not of the builder! That about the very last thing we should have said.—Ed.

## The Student's Column.

## TOWN DRAINAGE.

## V.—PIPES AND JOINTING.

THE junction places last mentioned are provided at the expense of the local authority, but the bend pipe joining it with the house-drain is provided, along with all other pipes of the drain, at the expense of the owner or occupier of the property. From the sewer to the boundary of the property the excavation of the pipe-trench is required by the local authority to be guarded against accidents both to the trench itself and to the public traffic,—the trench by proper struts from side to side, and the traffic by rails and temporary footways, and by lights during the night.

The width of the trench depends partly on its depth: if it be over 10 ft. deep it should be nearly 3 ft. wide; if the depth be less than that, 2 ft. 6 in. in width; and if it be no more than 4 or 5 ft., so that the earth can be cast out without intermediate staging, 2 ft. 8 in. is a sufficient width, both for this and for laying and jointing the pipe. The internal diameter of a house-drain is usually 6 in., with 4 in. branches, except to water-closets, each of which frequently has the 6-in. pipes continued to the foot of the vertical soil-pipe.

House-drain and sewer pipes of earthenware should be well burnt, truly circular and straight, free from blisters and other defects, and should be salt-glazed. The glazing is done in the kiln in the process of firing, chloride of sodium being thrown in while the kiln is at a high temperature, the salt being thus decomposed by the silica of the clay, forming a glass of silicate of sodium upon the pipes, both inside and out. The raw material of which pipes,—here called earthenware merely to distinguish them from those of iron or other metal,—are made may be of any kind of clay which will stand the firing, and retain the circular and straight form in which it is moulded; but many kinds of clay do not stand the firing required,—such, for instance, as those used for making common bricks and land drain-pipes, which fall out of shape. The Lambeth stoneware, so-called, is perhaps the best, but any good fire-clay which can be effectually salt-glazed is almost as good; perhaps quite so, as the thickness of fireclay pipes is usually a little greater than that of stoneware,—say in the following proportions:—

|                 | Diameter 4 in. | 6 in.         | 9 in.           | 12 in.          |
|-----------------|----------------|---------------|-----------------|-----------------|
| Stoneware ..... | $\frac{1}{2}$  | $\frac{3}{4}$ | 1               | 1 $\frac{1}{2}$ |
| Fireclay .....  | $\frac{1}{2}$  | $\frac{3}{4}$ | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ |

The joints of the pipes must be made water-tight, and especially underneath. If they are not so, the liquid part of the sewage will escape out of the drain and leave the solid part behind it. This is one of the commonest defects of house-drainage. It is not the largest pipe which makes the best house-drain: a large pipe becomes a long cesspit if the joints let out the liquid sewage. Besides, the leakage poisons the ground, and, in dry weather, ascends towards the surface by capillary attraction, and the gases and vapours which arise from it contaminate the air. The pores of the ground through which it passes have, in the first instance, a purifying effect on the sewage, by reason of the atmospheric air they contain, but this is soon lost, and the ground becomes permanently foul. The surface may be in most parts too compact, in a town, to admit the passage of gases through it, but in such parts as are not so they arise from the ground into which leakage of sewage takes place.

The joints of the pipes of house-drains and sewers are sometimes made with clay and sometimes with cement, but for common socket pipes a better joint than can be made with either of these is made with tarred spun-yarn. Clay does not harden sufficiently to support the end of the pipe within the socket when the weight of earth comes upon it, but drops below its proper level, squeezing out the clay beneath, and leaving an opening above. Cement can be left long enough to harden, and the joint does not suffer in this way; but with small pipes such as these some part of the cement may be pushed into the pipe at one or more of the joints, and may be left there; and whether small portions of the cement arise from the bottom of the joint, or fall from the top and become fixed upon the bottom of the pipe, they offer serious obstruction to the free flow of the sewage. Of course, it is intended that all such excrescences shall be removed before another

joint is made, and any joint-maker will attend properly to this instruction if he be asked to do so; but by occasional inadvertence one or a few of the numerous joints may be overlooked in this respect. With large pipes the case is somewhat different; the last joint made can be more easily seen before another pipe is brought to its place, and any imperfection of this sort can be remedied before the cement has had time to set. For 6-in. pipes a proper water-tight joint is made with two laps of tarred white spun-yarn, weighing  $\frac{1}{2}$  lb. This material is spun moderately hard, but not so hard as ropes, the diameter for small pipes being about  $\frac{1}{2}$  in. before caulking. A length of 4 ft. makes a joint, being passed twice round the spigot end of the pipe, the first lap being caulked in as soon as the pipe has been fully inserted into the socket, and the second one after it, with a proper caulking-tool, cranked for hand-hold, with a flat face,  $\frac{1}{2}$  in. by  $\frac{1}{4}$  in. of the hardest steel. To make the joint properly, a hole in the bottom of the trench is necessary to be made in front of each socket, to give the joint-maker room to work in.

To complete the joint the outer portion of the socket space is filled with well-tempered clay, or with cement; but hair-mortar is better than either of these. It should be made with blue lias, or other hydraulic lime, and clean, sharp sand, in the proportion of 1 of sand to 1 of lime, and hair enough to make the material hang together. Mortar or cement alone is too "short" to enable the workman to fill the joint properly underneath the pipe, and leave a full lap round the outside. The tarred spun-yarn is worth 3s. per cwt., or 3d. per lb., but as the jointing of 6-in. pipes in this way costs less than 3d. per lineal yard of drain, including the other material, and as this method is far more efficient for common socket-pipes than either of the others named, it may be said to be well worth the money.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

1,819, Improvements in T-squares. E. Lucas.

Attached to an ordinary drawing-board a T-square is, by this invention, so arranged that it will slide up or down the board, or can be raised by means of a pivot-hinge, or similar contrivance, a thumb-screw fixing the blade of the square in any position. The head of the square is also movable at will. The chief advantages are that greater steadiness is assured, and a firm basis provided for conveniently fixing or placing triangles, curves, or other appliances used in drawing.

2,708, Securing Scaffolding. A. C. Stevens.

Iron clamps are used for binding the poles together, their form depending upon the usual form of fastening them together by means of ropes. A book of iron is formed with an elongated tail screwed to receive a nut. The grip of the hook is made of a flat square section, roughened on the inner surface to afford a good grip on the pole. Holes are then bored at suitable heights to receive the hooks which support and bind the horizontal poles. The tail end of the hooks are passed through the vertical poles, with the open sides of the hook uppermost. In these hooks the horizontal poles are laid. The books are then drawn up by the nuts until they grip the horizontal poles, and bind them against the vertical poles.

2,839, Improvements in Water-closets. W. H. Stiel.

This invention relates to means for delivering a regulated amount of water for flushing purposes, and has for its main object the prevention of waste and to ensure also a proper flush while the pan is open, and an after-flush when it is closed. The pan valve is actuated by a weighted lever in the ordinary way, so that the raising of the lever opens the valve, and the falling closes the same. Between the lever and the operating handle mechanism is interposed which will raise the lever to the required extent to open the valve, and then release it and allow it to fall, notwithstanding the handle is still held up. The lever is locked by a suitably placed pawl until the after-flush is completed and the supply valve closed.

4,672, Ventilator, &amp;c. J. Troop.

A cast-iron appliance, something similar to a air-brick, is used by this inventor, but it has openings and partitions standing up from the bottom of the box nearly to the top, and arranged in lid are partitions from the top reaching nearly to the bottom. These partitions form a kind of grille and air is admitted and controlled as may be found desirable.

5,329, Manufacture of Paint. R. Stone.

Slate or slate refuse or waste slate is used for the purpose of this invention. The slate is burned in kilns and afterwards ground to a fine powder



This powder is mixed with oil, turpentine, or other suitable material to form paint. When an extra hard surface is required ground flint is added, or other ingredients are used according to the nature of the surface of the work under hand.

11,261, Ventilator and Smoke Escape for Theatres. G. R. Tasker.

A movable shutter and blind is formed on the roof over the stage of theatres and music-halls, and is so controlled by a single cord that by disconnecting the cord both shutter and blind can be opened immediately, thus uncovering the half or whole of roof, allowing the smoke to escape.

17,186, Wash-basins, &c. W. R. Maguire.

The idea of this patent is to provide improved means of spraying water upon the face and head of the person washing. A flushing rim with holes is formed round the interior of the basin, and the holes are so pierced that the water is sprayed upwards into the face of the person washing. The same mechanism is also used for w.c. basins, with an improved trap and water seal, which forms part of the invention.

#### NEW APPLICATIONS FOR PATENTS.

Jan. 14.—657, F. Baker, Fastenings for Cupboard and Wardrobe Doors, &c.—685, T. Turner, Apparatus for Turning Stone.—694, R. Suter, Frost-proof and Safety-pressure Pipes.

Jan. 15.—727, W. Thompson, Shutters for Windows, Doors, &c.—728, W. Thompson, Safety Bars for Protecting Doors, Windows, &c.

Jan. 16.—801, H. Hall, Tiles for Lining Walls, &c.—804, J. Deesley, Syphon-flushing Cisterns.—847, E. Edwards, Composition for Facilitating the Application and Preservation of Paint or Varnish upon Cement, &c.

Jan. 17.—652, W. Stephenson, Automatic Atmospheric Door-closer.—883, A. Hamilton, Door-handles.—906, J. Woodard, Sash-fastener.—907, J. Woodard, Apparatus for Securing Sash-lines to Sashes.

Jan. 18.—964, C. Widmark, Manufacture of Cement.—974, J. Gilmore and W. Clark, Locks and Fastenings.—980, R. Hitchins, Construction of Ceilings.

Jan. 19.—998, R. Newell, Ventilator or Chimney-top.—1,014, W. Hindle, Water-closets.—1,025, E. Kingsnorth, Windows, &c.—1,039, A. Randall, Window Sash-fastenings.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

16,448, T. Smith, Mitreing Machines.—16,824, H. Aitken, Treating Timber.—16,939, G. Binswanger and H. Coates, Electric Bells.—17,091, C. Perrot and Others, Stove Grates.—17,247, L. Scott, Hot Water, Warming, and Heating Stoves.—17,305, J. Haywood and J. Hunt, Sash-fasteners and Locking Springs for same.—17,502, S. and W. Fisher, Handles for Doors, Windows, and other Fastenings.—17,574, H. Sauvage, Manufacture of Paperhangings, &c.—17,693, R. Furstenberg, Waterproof, Fire, and Weather-resisting Material for Roof Covering.—17,741, J. Wroe, Looks.—17,746, W. Sturge, Ceiling Roses, Switches, and similar Electrical Fittings.—17,749, J. Keyner, Water-heating Apparatus for Buildings, &c.—17,834, H. Handcock, Automatic Water-sprinkler.—17,836, C. Winton, T-Square.—17,879, H. Watts, Water-closet seat.—18,049, J. Gibson and W. Glazier, Stop-ladders, &c.—18,073, J. Ferguson, Fire-proof Ventilating Hearths.—18,083, D. Fau, Band Saws.—18,195, H. Heaton and W. Knight, Chimney-pots.—18,235, E. Pyper, Metal Pipes or Tubes.—18,264, E. J. Austen, Smoke-extractors, Exhausters, Ventilators, &c.—18,308, J. Abel, Door-closer, Check, &c.—18,371, H. Illingworth and S. Rushworth, Screw Nails.—18,376, W. Watson, Attaching Sash-cords to Windows.—18,535, J. Lane, Safety Apparatus for Window Painting, &c.—18,599, N. Browne, Fire Grates.—18,608, R. Paul, Electric Bells.—18,771, W. Millar and Others, Fire-proof Building Construction.—18,883, J. Macnaughton, Window-sashes.

#### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

2,081, J. and J. Hill, Automatic Saw-sharpening Machines.—2,692, J. Robertson and J. Patrick, Portland Cement, &c.—2,904, P. Clark, Smoke-consuming Cooking Register Stoves.—3,888, A. Boulton, Door-binges.—4,888, F. Turrettini, Endless Saws for Cutting Stone.—15,058, W. Lindholdt, Ventilation, &c.—16,690, A. Petit, Moistening Air, Ventilation, &c.—17,169, D. Grove, Filtering Air, &c.—17,351, R. Book, Waste Preventer.—17,799, S. Downs and W. Greenwood, Filling for Painters, &c.—17,960, J. Wellington, Windows.—18,070, T. Aldridge, Chimney-pot and Ventilator.—18,443, G. Tunks, Bakers' Ovens.—18,766, W. Horn, Fire-proof Iron Buildings.

**Extensive Harbour and Dock Construction in Russia.**—The *Novosti* states that a syndicate of Russian financiers have formed a company at Kijef, for constructing extensive harbour and dock works in the principal Russian ports, at an estimated cost of about 5,000,000.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

JAN. 21.  
By T. Woods.  
St. John's-wood—5, Queen's-terrace, 30 years, ground-rent £10 ..... £900  
JAN. 22.  
By W. HIXON.  
Blackheath, Ulundi-road—A plot of freehold land ..... 100  
By J. TIDEMAN.  
New Southgate—The freehold residence, "The Grove" ..... 1,220  
By DRIVER & PERFECT.  
Camden Town—8, Miller-street, 10 years, ground-rent £3, 10s ..... 80  
Kensal Town—60, Willes-road, 22 years, ground-rent £5 ..... 200  
Finsbury Park—10 and 12, Campbell-road, 77 years, ground-rent £9 ..... 215

JAN. 23.  
By FARMHOUSE, ELLIS, & CO.  
Strand—368, term 39 years, ground-rent £30 ..... 3,650  
By MARK LILL.  
Bow—47, Tredegar-road, freehold ..... 789  
Forest Gate, Clova-road—"Phebe Villa," freehold "Margaret," "Elizabeth," and "Sarah" Villas, freehold ..... 465  
..... 1,365

JAN. 24.  
By NEWBORN & HARDING.  
Westminster—108, Horseferry-road, freehold ..... 1,000  
Hackney-road—129, 130, 136, and 138, Columbia-road, 37 years, ground-rent £21 ..... 690  
King's Cross—29, Argyle-square, 55 years, ground-rent £7 ..... 690  
Regent's Park—39, Albany-street, and 55, Little Albany-street, 36 years, ground-rent £13, 10s ..... 990  
By E. STIMSON.  
Stockwell—1, 3, 5, and 7, Bloomgrove-road, 91 years, ground-rent £21 ..... 350  
8 and 10, Broomgrove-road, 91 years, ground-rent £10, 15s ..... 230  
5, Mount-place, 54 years, ground-rent 1s. 6d. .... 235  
Marylebone—95, Bolsover-street, 35 years, ground-rent £16 ..... 1,010  
64, Bolsover-street, 25 years, ground-rent £10 ..... 335  
Maida-hill—147, Carlisle-street, 33 years, ground-rent £2, 10s ..... 355

By C. & C. T. MOORE.  
Limehouse—10 to 13, Taylor's-place, 34 years, ground-rent £7 ..... 730  
JAN. 25.  
By R. REID.  
Portland-place—No. 29, and stabling, 16 years, ground-rent £150 ..... 1,500  
Aldersgate-street and Jewin-street—A plot of land, area 1,864 ft., let for 50 years, at £450 a year.

By TOPPIS & HARDING.  
Kilburn—13, Arden-street, 37 years, ground-rent £7, 10s ..... 200  
Pekham—1, Adys-road, 65 years, ground-rent £5, 10s ..... 200  
Lower Sydenham—6 to 8, Denmark-terrace, 90 years, ground-rent £21 ..... 165  
Walthamstow—5, 6, and 7, Hillside-terrace, 90 years, ground-rent £4, 10s ..... 110  
By J. BAX & SONS.  
Carnarvon—The lease of the Welsh Ffordale Mine, term 15 years ..... 110  
Northolt—Two freehold cottages ..... 285  
Three cottages ..... 165

#### MEETINGS.

##### MONDAY, FEBRUARY 4.

Royal Academy.—Professor Aitchison, A.R.A., on "Roman Architecture." VIII. 8 p.m.  
Royal Institution.—Monthly meeting, 5 p.m.  
Society of Engineers.—(1) The President for the past year, Mr. A. T. Walmisley, will present the Premiums awarded for Papers read during the year. (2) The President for the year 1888, Mr. J. R. Ballie, will deliver his Inaugural Address. 7.30 p.m.  
Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. W. Lawrence. 8 p.m.  
Leeds and Yorkshire Architectural Society.—Mr. R. J. Johnson on "A Plea for Old English Art." 7.30 p.m.  
Liverpool Architectural Society.—Mr. A. Culshaw on "Some Notes about American Cities." 7 p.m.  
Society in the Early Centuries, A.D." 5 p.m.  
Victoria Institute.—8 p.m.

##### TUESDAY, FEBRUARY 5.

Society of Arts (Applied Art Section).—Mr. Edouard Geinler on "Manufacture of Silver Porcelain." 8 p.m.  
Institution of Civil Engineers.—Further discussion on (1) Mr. J. Carruthers' paper on "The Steep Incline on the Puerto Cabello and Valencia Railway, Venezuela." (2) Mr. R. Wilson's paper on "The Cost of Working the Hart's Mountain Railway." (3) Mr. J. P. Maxwell's paper on "Further Information on the Working of the Fell System on the Rimutaka Incline, N.Z." 8 p.m.  
Society of Bibliographical Antiquaries.—8 p.m.  
Birmingham Architectural Association.—Mr. J. Ward on "Decorative Art and Fashion."  
Manchester Architectural Association.—Mr. A. Standing on "The Treatment and Manipulation of Metal in Art Metal Work." 7.30 p.m.  
Glasgow Architectural Association.—Mr. G. Tudhope on "The Antiquities of Lanarkshire."

##### WEDNESDAY, FEBRUARY 6.

Society of Arts.—Mr. G. L. Gomme, F.S.A., on "The Status of the County Council." 8 p.m.  
Carpenters' Hall (London-seals).—Mr. Banister Fletcher on "Art and Design." 8 p.m.  
Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting. 8.30 p.m.  
Civil and Mechanical Engineers' Society.—Mr. W. D. Scott Moncrieff on "The Inspection and Cleansing of Domestic Drainage." 7 p.m.  
British Archaeological Association.—Major H. A. Joseph on "The original records of the erection of the Steeple to St. Antholin's Church, London, by Sir Christopher Wren." 8 p.m.

Liverpool Engineering Society.—Adjourned Discussion on Mr. West's paper on "Steel in the Hands of the Naval Architect." 8 p.m.  
St. Paul's Ecclesiastical Society.—Rev. Ernest Geldart on "Transcripts." 7.30 p.m.

##### THURSDAY, FEBRUARY 7.

Royal Academy.—Professor Aitchison, A.R.A., on "Roman Architecture." IV. 8 p.m.  
Royal Institution.—Professor J. W. Judd, F.R.S., on "The Metamorphoses of Minerals." III. 3 p.m.  
Royal Archaeological Institute.—(1) Mr. Thackeray Turner on "Usual Features in Old Churches." (2) Mr. W. Lovell on "Banbury Cross." 4 p.m.  
Society of Antiquaries.—8.30 p.m.  
Edinburgh Architectural Association.—Mr. John Honeyman on "Glasgow Cathedral." 8 p.m.

##### FRIDAY, FEBRUARY 8.

Royal Institution.—Sir William Thomson, F.R.S., on "Electrostatic Measurement." 9 p.m.  
Institution of Civil Engineers (Students' Meeting).—Mr. J. T. Twinnerton on "Flexible Wheel-bases of Railway Rolling-stock." 7.30 p.m.

##### SATURDAY, FEBRUARY 9.

Edinburgh Architectural Association.—Visit to Free Library and Edinburgh University Union Buildings.

#### Miscellaneous.

**Proposed Exhibition of Decorative Art at Liverpool.**—The Art and Exhibitions Subcommittee of the Corporation of Liverpool propose, if suitable arrangements can be made, to hold an Exhibition of Art Decoration and Art applied to Manufactures, during the months of April, May, June, and July, 1889. The proposed Exhibition will include tapestry, embroidery, wall-papers, ceramics, wood-carving and turning, metal wares, bookbinding, and art work generally. It is proposed to hold the Exhibition in the New Rooms of the Walker Art Gallery (i.e., those opened in 1884), and it is hoped that other rooms will be available should additional space be required. The prospectus states that "the object of the Exhibition is to make known the many beautiful designs, processes, fabrics, and wares generally, that are now being produced in the United Kingdom, to encourage art workers, to arouse a spirit of emulation amongst art manufacturers, and to elevate the taste of the public. It is not, therefore, intended to hold merely an exhibition for the advertisement of rival or competing firms, but to promote art in its application to industry, and to develop existing agencies and facilities for higher artistic aims in public and private life." It is desired that all communications respecting the proposed Exhibition be addressed to Mr. Charles Dyll, Curator.

**Leeds and Yorkshire Architectural Society.**—Mr. Reginald T. Blomfield writes to us:—"In a notice of a paper read to the Leeds and Yorkshire Architectural Society in your last issue, quoted from the *Leeds Mercury*, I am reported as saying that the first period of the English Renaissance ended in 1650. I really said 1550. Also that Inigo Jones went to the Netherlands. I really said, 'Perhaps he went to Denmark.'"

**The Registration of Plumbers.**—Dr. Ewart, Chairman of the Sanitary Committee at Brighton, has been elected President of the District Council for the Registration of Plumbers for the County of Sussex for the current year. It has been arranged to open classes for plumbers in the Brighton Technical Institute.—A public meeting was held in Nottingham on Tuesday evening in promotion of the movement.

**Liverpool Engineering Society.**—The sixth meeting of the present session of this Society was held at the Royal Institution, Colquhoun-street, on January 23, Mr. J. J. Potts, Assoc.-M.Inst. C.E., Vice-President, in the chair, when a paper was read by Mr. H. H. West, M.Inst. C.E., on "Still in the hands of the Naval Architect." The discussion on the subject of the paper was adjourned till next meeting.

**Building Operations in Copenhagen.**—The Danish Government has presented a Bill to the Assembly for the erection in Copenhagen of a new Royal free hospital, capable of accommodating 800 patients, a physiological, anatomical, and pathological institute, and a hospital for women, the total cost of which is estimated at over 300,000.

**Norwegian Marble.**—The Norwegian marble deposits discovered in the province of Nordland last year, and to which we then referred, have been sold to a Norwegian firm of merchants for a sum of 7,000. Quarrying is to be begun at once, and samples forwarded to this country and others.



### Edinburgh Architectural Association.

A meeting of the Edinburgh Architectural Association was held in the Architectural Hall, Edinburgh, on the 24th ult., Professor Baldwin Brown presiding. Mr. Alexander W. Paterson, Glasgow, read a paper on the "Training of the Architect at Home and Abroad." The lecturer stated his reasons for taking up this subject. There was a growing feeling, he said, in favour of a more extended education for the architect, and the advantage he had had of personal experience of both foreign and home methods led him to divide his paper into three parts:—1, The training at the École des Beaux Arts, Paris; 2, the methods of training pursued formerly and at the present day in this country; 3, a short analysis of these systems, with the possibility of extending the academic training in this country. The lecturer glanced at various continental schools, with the different modes of training. In Scotland the old system of five years' apprenticeship or pupillage was considered as insufficient of itself to give a thorough training, seeing that the student had little incentive to study on his own account and few opportunities were he so inclined, while in the majority of offices the work done was of little educative value, artistic or practical. The growing attention paid to outside training was traced in London—in the Royal Academy School, Royal Institute of British Architects, &c., and other places throughout the country. The scheme drawn up by the Glasgow Institute of Architects was considered too exacting when taken along with office work and during the five years' apprenticeship. The lecturer thought that in Scotland the centralisation of the French school and the unpractical nature of some of its teaching was to be avoided. On the other hand, the thoroughness of its training, artistic and scientific, the time over which its studies were continued, the emulation between its pupils and studies, and the advantage of having the greatest architects as its teachers, might be obtained in Scotland by a scheme including the extension of the present opportunities by starting day classes and having visiting architects as Professors in Technical Colleges, and by general promulgation of an authorised course of instruction by the Royal Institute, extending over eight or nine years, in which the student could be tested by a series of three examinations held simultaneously in the different centres, the final one occupying the position of the obligatory examination, which entitled him to the rank of an Associate of that body. A vote of thanks to the lecturer concluded the proceedings.

**British Archaeological Association.**—At a meeting of this Association held on Wednesday, January 16, the Rev. S. M. Mayhew in the chair, an interesting notice of the discovery of the ruins of the ancient Basilican Church of St. Valentine, at Rome, demolished in the fifteenth century, was rendered by Mr. Loftus Brock, F.S.A. The site was met with after the excavation of an ancient cemetery, which was found to adjoin the church. Mr. Earle Way exhibited two almost perfect pilgrim's bottles found in Tabard-street, Southwark, in some recent excavations, one being of green glazed ware, the other red. Their connexion with the Canterbury Pilgrims, owing to the position where they were discovered, appeared to be fairly evident. Some examples of forged antiquities well known as "Billy and Charley" castings were exhibited as a warning to unwary collectors, and it was suggested that a collection of these articles should be made and published, with a view to the protection of the public in years to come. The chairman exhibited a fine incense-boat of latten, once gilt, found near Rochester. It is of Italian work of early sixteenth-century date. A paper was then read by the Rev. S. M. Mayhew, on North Cathness and Orkney, in which the results of an extended visit were detailed, and many curious facts relating to the early history of the almost treeless district were reported. The lecture was illustrated by a large series of drawings and photographs. A short paper was subsequently read by the Rev. Canon Collier, on certain inscribed stones in South Wales, near Haverfordwest.

**Night-Shelters for the Poor.**—The Tower Hamlets Swimming Baths, Whitechapel, have been secured by the Salvation Army for a women and children's night-shelter. The cost of the alterations and fittings will amount to £1,500. Mr. F. J. Coxhead, builder, of Leytonstone, is carrying out the work, under the superintendence of Mr. J. Williams Dunford, architect.

**The English Iron Trade.**—The English iron market is perfectly steady, producers being well covered forward, and consequently able to resist any cutting down in prices that may be attempted. The tendency is rather towards a rise, especially in manufactured iron and steel. Although the Glasgow warrant market has been flat during the week, owing, rather, to outside influences, makers are pretty firm in their quotations, both inland consumption and shipments being good. Makers of Cleveland iron are also stiffer in their rates. Lancashire producers of pig-iron are still doing a fair trade at former prices, but district brands are somewhat easier. The Staffordshire pig-iron trade is marked by stability. There is no change in hematite iron, which continues firm at former quotations, steel-makers having large requirements. Finished iron and steel are in good demand, and prices have a stiffening tendency. In the north-west, manufacturers have in some cases put up their quotations for steel rails 5s. a ton. Shipbuilders are still receiving fair orders for new vessels, but the strike in the shipyards on the Tees interferes with business. Engineers are busy in nearly all departments.—*Iron.*

**The North Sea Baltic Canal.**—According to the statement presented to the German Parliament, 4,000 men are to be employed upon the North Sea-Baltic Canal during the present year. Barracks capable of accommodating from 100 to 400 men are now being erected along the entire course of the canal, where accommodation and baths are supplied free. It has now been decided that the connexion between the city of Rendsburg and the rural districts beyond shall be established by means of a combined railway, carriage, and foot bridge. The high-road to Kiel is not to be diverted. At Nobiskro there will be a ferry, whilst the railway will be drawn across the canal on two single-track railway bridges. The lock for the river Elbe is to be constructed at Weskrönfeld, and will be 5 metres in depth and 12 metres in breadth.

**The Fatal Fall of a Building in Birmingham.**—The coroner's inquest as to the deaths of the three workmen who were killed by the fall of a building in Lawley-street, Birmingham, was resumed and concluded on Tuesday last, when the jury found that the three deceased men came by their death by the fall of the wall, and that the fall of the wall was due to the culpable negligence of William Swift, the master bricklayer. The coroner said this amounted to manslaughter, and proceeded to make out the commitment. Bail was granted, but the amount not fixed. The chief points of the evidence were given in last week's *Builder*, p. 76.

**The Hamburg Art and Industrial Exhibition, 1889.**—The Art and Industrial Exhibition to be held this year in Hamburg, says a correspondent in that city, will be of considerable magnitude. That the interest in it is very great there is shown by the circumstance that already 160 prizes of honour, ranging in value from 100 to 300 marks, have been offered by private persons for the solution of technical and practical subjects. The number of exhibitors in Hamburg alone is now nearly 2,000, whilst a considerable number is also announced from Altona.

**The New English Art Club.**—This club has again made arrangements to hold an exhibition of modern works of art, at the Egyptian Hall, Piccadilly, which it is promised will be superior to any collection it has yet shown. Among the successful candidates at the recent election to membership of the society were M. Maurice Lobre and M. Hellen, whose exquisite pictures attracted such attention at the recent pastel exhibition.

**Royal Female School of Art.**—The Lord Mayor will distribute the prizes to the successful students of the Royal Female School of Art, Queen-square, Bloomsbury, on Tuesday, February 12. The ceremony will take place, by the kind permission of the Lord Mayor, in the Egyptian Hall of the Mansion House.

**The Clerks of Works' Association of Great Britain.**—The sixth annual dinner of this Association will take place at "The Holborn Restaurant" on Monday, February 11, Mr. J. Macvicar Anderson, Hon. Sec. R.I.B.A., in the chair.

**Stuttgart.**—The Society of Arts of the Kingdom of Wurtemberg has just taken possession of their new building at Stuttgart, which is described in German journals as one of the finest of the modern buildings in that city.

**St. Paul's Ecclesiological Society.**—The tenth annual report of this Society, submitted to the annual meeting of members on the 26th ult., chronicles what appears to have been another very successful year's work of the Society:—"The papers read at the evening meetings have been of unusual interest, and the visits have generally been very largely attended. Since the last report, twelve meetings have been held at the Chapter House and papers have been read on the following subjects:—By Mr. Somers Clarke, on 'The Cathedral of Las Palmas, Grand Canary'; by Mr. W. Bolton, 'English and Foreign Cathedrals and Churches contrasted and compared'; by Mr. J. T. Micklethwaite, 'Suggestions about the Ritual of the Communion Service'; by Mr. Thomas Garner, on 'The Altar-Screen at St. Paul's Cathedral'; by Mr. J. Starkie Gardner, on 'Metal Grilles in connexion with Architecture'; by Mr. Charles Browne, on 'The Knights Hospitallers'; by Major Heales, on 'The Ecclesiology of Bornholm'; by Mr. E. P. Loftus Brock, on 'The Churches of Great Britain and Ireland compared in respect of their orientation with those of Italy and the East'; by Mr. W. H. St. John Hope, on 'The actual uses of Colours in the Medieval Church of England'; by Mr. J. Grimshire, giving 'a short account of the Ancient Cathedrals and Conventual Churches of Scotland'; by the Rev. J. R. Buchanan, on 'Horne Church, Kent'; and by Mr. W. Bolton, on 'The Marshland Churches of Norfolk, Lincolnshire, and Yorkshire.' Afternoon visits were made to St. Paul's Cathedral, under the guidance of the Rev. Lewis Gilbertson; to the Church of St. Mary Overie, under the direction of Mr. F. T. Dollman; to Westminster Abbey, under the direction of Mr. J. T. Micklethwaite; to West Wickham and Addington, where papers were read by Mr. George Clinch, supplemented by a description of the stained glass at West Wickham by Mr. Arthur Taylor, and of the tombs at Addington by Mr. S. W. Kershaw; to Harmondsworth, where Mr. D. D. White described the Church and Tithe Barn, and to Harefield, under the direction of Mr. G. H. Birch. A whole-day Excursion was made to Lincoln. The Cathedral was visited under the direction of the Rev. Precentor Venables. The Council desire to express their thanks to all the gentlemen who have thus contributed to the successful carrying out of these proceedings, and also to the clergy and others for the welcome with which the visits of the Society have at all times been received. Part III. of Volume II. of the 'Transactions' has been issued during the year." The balance-sheet is not as satisfactory as could be desired, owing to many members having allowed their subscriptions to remain unpaid. Twenty-nine new members have been elected during the year, the number on the register being now 302.

**The Central Siberian Railway.**—The *Novosti* states that at the end of last year the survey of the new central Siberian railway, under the Government engineer, M. Mejdourov, between Tomsk and Irkutsk, has been completed for a distance of 800 miles. On the first section of the line, from Tomsk to Atchinsk, with branch lines to the ports of Tosna and Tchoulym—a distance of 260 miles—the cost of the track is estimated at 1,770l. per verst.

### PRICES CURRENT OF MATERIALS.

| TIMBER.                             | £. | s. | d. | £. | s. | d. |
|-------------------------------------|----|----|----|----|----|----|
| Greenheart, B.G. .... ton           | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, R.L. .... ton                 | 9  | 0  | 0  | 14 | 0  | 0  |
| Sesquiu, U.S. .... foot cube        | 0  | 2  | 3  | 0  | 3  | 0  |
| Ash, Canada, .... load              | 3  | 10 | 0  | 8  | 0  | 0  |
| Birch " " " " " " " "               | 4  | 10 | 0  | 8  | 0  | 0  |
| Hlm " " " " " " " "                 | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantsie, &c. ....              | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak " " " " " " " "                 | 2  | 0  | 0  | 4  | 0  | 0  |
| " " " " " " " "                     | 5  | 10 | 0  | 7  | 0  | 0  |
| Pine, Canada red " " " "            | 3  | 5  | 0  | 4  | 0  | 0  |
| " " yellow " " " "                  | 3  | 10 | 0  | 5  | 10 | 0  |
| Lath, Dantsie, .... fathom          | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg, " " " "             | 5  | 0  | 0  | 9  | 10 | 0  |
| Wainscot, Riga, &c. .... Jog        | 2  | 15 | 0  | 4  | 5  | 0  |
| " " " " " " " " " "                 | 2  | 15 | 0  | 3  | 5  | 0  |
| Odessa, crown " " " "               | 2  | 15 | 0  | 3  | 5  | 0  |
| Deal, Finland, 2nd and 1st. Ad. 100 | 5  | 0  | 0  | 10 | 0  | 0  |
| " " 4th and 3rd " " " "             | 7  | 0  | 0  | 8  | 10 | 0  |
| " " " " " " " " " "                 | 7  | 0  | 0  | 8  | 0  | 0  |
| St. Petersburg, 1st yellow " " " "  | 9  | 0  | 0  | 10 | 0  | 0  |
| " " 2nd " " " " " "                 | 9  | 0  | 0  | 10 | 0  | 0  |
| " " white " " " " " "               | 8  | 0  | 0  | 10 | 10 | 0  |
| Swedish " " " " " " " "             | 7  | 10 | 0  | 18 | 0  | 0  |
| White Spruce " " " " " " " "        | 8  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st " " " "           | 16 | 0  | 0  | 28 | 10 | 0  |
| " " 2nd " " " " " "                 | 11 | 0  | 0  | 17 | 10 | 0  |
| " " 3rd, &c. " " " " " "            | 7  | 10 | 0  | 10 | 10 | 0  |
| " Spruce, 1st " " " " " "           | 9  | 10 | 0  | 10 | 10 | 0  |
| " " 3rd and 2nd " " " "             | 7  | 0  | 0  | 8  | 10 | 0  |



|                                                                                                                                                             |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|
| <b>KESTON (Kent).—</b> For rebuilding "The Fox" public-house, Keston, Kent, for Messrs. H. & V. Nicholl (Limited), Mr. Albert I. Guy, architect, Lewisham:— |        |      |
| Balaam Bros.....                                                                                                                                            | 23,300 | 0    |
| Gill & Co.....                                                                                                                                              | 1,897  | 0    |
| S. J. Jerrard.....                                                                                                                                          | 1,788  | 0    |
| D. Payne.....                                                                                                                                               | 1,740  | 0    |
| T. Knight, Sidcup (accepted).....                                                                                                                           | 1,877  | 0    |
| <b>LEWISHAM.—</b> For the erection of two villa residences, High Road, Lewisham, Mr. Albert I. Guy, architect, Lewisham:—                                   |        |      |
| H. L. Holloway.....                                                                                                                                         | 21,487 | 0    |
| Stanford Bros.....                                                                                                                                          | 1,284  | 0    |
| French.....                                                                                                                                                 | 1,098  | 0    |
| S. J. Jerrard, Lewisham (accepted).....                                                                                                                     | 1,046  | 0    |
| Knight.....                                                                                                                                                 | 1,045  | 0    |
| <b>LEWISHAM.—</b> For alterations at "The Plough" stable, for Messrs. H. & V. Nicholl (Limited), Mr. Albert I. Guy, architect, Lewisham:—                   |        |      |
| H. Roare, Lewisham (accepted).....                                                                                                                          | £215   | 10 0 |
| <b>LINCOLN.—</b> For alterations and additions to Newland Auction Mart, for Mr. H. Gadaby, Mr. Henry Baures, surveyor:—                                     |        |      |

## CONTRACTS.

|                                                                                                                                                                                                          |        |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|
| J. M. Harrison                                                                                                                                                                                           | 2194   | 0  |
| C.lose & Co.                                                                                                                                                                                             | 185    | 0  |
| G. E. Harrison                                                                                                                                                                                           | 178    | 0  |
| J. R. Harrison                                                                                                                                                                                           | 172    | 0  |
| Landswand & Son.                                                                                                                                                                                         | 170    | 0  |
| G. Cowen (accepted)                                                                                                                                                                                      | 167    | 0  |
| [All of Lincoln.]                                                                                                                                                                                        |        |    |
| LONDON.—For the erection of a dining-hall, kitchen, &c., at the St. George's Union Workhouse, Fulham-road, Mr. H. Saxon Snell, F.R.I.B.A., the St. George's Union, &c.                                   |        |    |
| T. Triggs                                                                                                                                                                                                | £1,052 | 0  |
| C. Harrison & Co.                                                                                                                                                                                        | 10,900 | 0  |
| G. E. Harrison                                                                                                                                                                                           | 10,477 | 0  |
| Thos. Nye                                                                                                                                                                                                | 10,477 | 0  |
| Mowlem & Co.                                                                                                                                                                                             | 10,393 | 0  |
| J. H. Langley                                                                                                                                                                                            | 10,196 | 0  |
| W. J. Adcock                                                                                                                                                                                             | 9,975  | 0  |
| Wall Bros.                                                                                                                                                                                               | 9,975  | 0  |
| Caplan & Redgrave                                                                                                                                                                                        | 9,143  | 0  |
| LONDON.—For alterations and additions to Clerk's offices at the Hackney Union, Homerton, for the Hackney Union, Mr. W. Barnett, Clerk, 10, Abchurch Lane, E.C.                                           |        |    |
| Stimpson, Brompton                                                                                                                                                                                       | £1,246 | 0  |
| Torode, Tottenham                                                                                                                                                                                        | 1,220  | 0  |
| K. Knight, Tottenham                                                                                                                                                                                     | 1,233  | 13 |
| Sherratt, Leyton                                                                                                                                                                                         | 1,220  | 0  |
| Jackson & Todd, Hackney                                                                                                                                                                                  | 1,107  | 10 |
| Lizell, Bedford-row                                                                                                                                                                                      | 1,100  | 0  |
| Edmunds, Poplar                                                                                                                                                                                          | 1,073  | 0  |
| Brass & Son, Old-street                                                                                                                                                                                  | 1,067  | 0  |
| T. Boyce, Hackney                                                                                                                                                                                        | 1,061  | 0  |
| R. & E. Evans, Peckham                                                                                                                                                                                   | 1,048  | 0  |
| C. Barrett, Clapton                                                                                                                                                                                      | 1,037  | 0  |
| Barrett & Power, Hackney                                                                                                                                                                                 | 1,027  | 0  |
| Dabbs, Stamford-hill                                                                                                                                                                                     | 1,021  | 0  |
| W. C. Ross, Bethnal-green                                                                                                                                                                                | 1,014  | 0  |
| J. R. Hunt                                                                                                                                                                                               | 993    | 0  |
| Shurmer                                                                                                                                                                                                  | 989    | 0  |
| Sannon & Co., Greenwich                                                                                                                                                                                  | 987    | 0  |
| Geddes, Clapton                                                                                                                                                                                          | 984    | 0  |
| Caplan & Redgrave, Finsbury                                                                                                                                                                              | 984    | 0  |
| Edwards                                                                                                                                                                                                  | 962    | 0  |
| H. Potter, Clapton                                                                                                                                                                                       | 923    | 0  |
| Frederic Fitzcarran                                                                                                                                                                                      | 923    | 0  |
| J. H. Mollett, Pole-street, Hoxton                                                                                                                                                                       | 831    | 0  |
| Collier, Fitzroy-square                                                                                                                                                                                  | 790    | 0  |
| LONDON.—For pulling down and rebuilding premises, Nos. 19 and 21, Wilson-street, Finsbury, R.C., for Messrs. Carter & Sons. Quantities abstracted. Messrs. George Carter & Sons, 10, Abchurch Lane, E.C. |        |    |

| Nature of Appointment. | By whom Advertised.                      | Salary.             | Applications to be in. | Page.  |
|------------------------|------------------------------------------|---------------------|------------------------|--------|
| the Works .....        | Paddington Vestry .....                  | £140 .....          | Feb. 5th .....         | xviii. |
| ndent of Roads .....   | St. John's, Hampstead Vestry .....       | £2 2s. weekly ..... | Feb. 5th .....         | xviii. |
| of Nuisances .....     | St. Margaret and St. John's Vestry ..... | £120 .....          | Feb. 9th .....         | xviii. |

Communications for insertion under this heading must  
 be sent to the Editor not later than 12 Noon on Thursdays.

|                                                                                                                                                                                                                                                       |        |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|---|
| LONDON.—For erecting warehouse, Worship-street,<br>for Messrs. Fox, Bros., Mr. Edwin T. Hall, architect,<br>7, Moorgate-street, W.C., by Messrs. Evans &<br>Deacon, Adelaide-street, W.C. ....                                                        | 1,400  | 0 | 0 |
| Burill, Reddall, & Co. ....                                                                                                                                                                                                                           | 23,330 | 0 | 0 |
| Holliday & Greenwood ....                                                                                                                                                                                                                             | 3,077  | 0 | 0 |
| Woodward & Co. ....                                                                                                                                                                                                                                   | 3,000  | 0 | 0 |
| Spence & Co. ....                                                                                                                                                                                                                                     | 2,888  | 0 | 0 |
| Foster & Dicksee (accepted) .....                                                                                                                                                                                                                     | 2,888  | 0 | 0 |
| LONDON.—For the completion of the Pevsley Hall and<br>Matthias Mission House, Chilton-street, Bethnal-green,<br>Second contract, Messrs. William Reddall & Son,<br>architects, 10, Grosvenor-street, Finsbury, by<br>Kilby & Gayford (accepted) ..... |        |   |   |
| LONDON.—For the surface excavation on the sites of<br>tians' dwellings, Brady-street, Whitechapel, Messrs.<br>S. Joseph & Smithem, architects:—                                                                                                       |        |   |   |
| J. Bass .....                                                                                                                                                                                                                                         | £2,017 | 0 | 0 |
| Catermole & Sons .....                                                                                                                                                                                                                                | 1,925  | 0 | 0 |
| N. Fortescue .....                                                                                                                                                                                                                                    | 1,919  | 0 | 0 |
|                                                                                                                                                                                                                                                       | 1,898  | 0 | 0 |
| LONDON.—For decoration at 23, Cavendish-square,<br>Mr. J. V. Birch, Mr. E. M. Whitaker, architect:—                                                                                                                                                   |        |   |   |

**LONDON.**—For alterations to the "Three Compasses" public-house, 34, Wandsworth-road, S.W. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—  
 Jackson & Todd ..... £2,491 0 0  
 Hearle & Son ..... 2,462 0 0  
 Drew & Cadman ..... 2,366 0 0  
 Turtill & Appleton ..... 2,360 0 0  
 W. Johnson ..... 2,410 0 0  
 W. Shurmer ..... 2,286 0 0  
 C. Cox ..... 2,280 0 0  
 W. Smith ..... 2,230 0 0  
 J. Mills ..... 2,160 0 0  
 F. W. Gill & Co. (accepted) ..... 1,979 0 0

**LONDON.**—For alterations to the "Prince Arthur" public-house, Brunswick-road, Poplar, E. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—  
 J. Hughes ..... £1,790 0 0  
 Jackson & Todd ..... 1,677 0 0  
 Hearle & Son ..... 1,593 0 0  
 Calnan & Co. ..... 1,524 0 0  
 J. Outhwaite & Son ..... 1,518 0 0  
 C. Cox ..... 1,515 0 0  
 J. Sparkes ..... 1,487 0 0  
 J. Holland (accepted) ..... 1,387 0 0

**SHEFFIELD.**—For sewerage, levelling, paving, &c. Mr. C. F. Wike, C.E., Surveyor.

|                                        | Norman-street. | Don-road. | Parrot-street. | Liverpool-street. | Nelson-street. | Total.     |
|----------------------------------------|----------------|-----------|----------------|-------------------|----------------|------------|
| £. s. d.                               | £. s. d.       | £. s. d.  | £. s. d.       | £. s. d.          | £. s. d.       | £. s. d.   |
| Mr. Henry Hobson, Sheffield .....      | 263 4 5        | 451 2 9   | 223 5 6        | 641 8 0           | 251 17 8       | 1,835 18 4 |
| Mr. T. A. Spring, Sheffield .....      | 248 13 7       | 418 1 3   | 203 7 9        | 508 18 10         | 230 8 1        | 1,669 9 6  |
| Mr. Frank Evers, Sheffield .....       | 247 18 10      | 339 3 8   | 204 9 8        | 594 10 2          | 251 2 7        | 1,617 4 11 |
| Mr. James Dickson, St. Albans .....    | 239 0 9        | 372 0 0   | 198 0 0        | 572 0 0           | 219 0 0        | 1,601 0 0  |
| Mr. John Hill, Sheffield .....         | 230 18 0       | 396 2 0   | 189 8 6        | 553 2 9           | 216 2 10       | 1,584 14 1 |
| Mr. D. Barry, Radcliffe-on-Trent ..... | 230 10 2       | 378 8 4   | 192 19 3       | 544 14 7          | 217 2 0        | 1,563 14 4 |
| Mr. Geo. H. Hall, Sheffield .....      | 227 14 11      | 364 16 1  | 187 17 6       | 551 16 7          | 213 17 5       | 1,548 2 6  |
| Mr. Joseph Andrews, Sheffield .....    | 215 2 2        | 349 18 10 | 165 16 1       | 476 7 11          | 185 6 2        | 1,392 11 2 |

\* Accepted.

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## TO CORRESPONDENTS.

M. & S. (Lancs., but we had previously received (2)—B. H. (your letter is hardly one that we can print)—T. R. H.—J. H. B.—G. A. H. (perhaps you will let us know what is your special interest in the material recommended)—J. J. & Son (should send amount). All statements of facts (note of tenders, for instance, must be accompanied by the name of the tenderer, and, necessarily for publication, we are compelled to decline publishing outwards and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond news items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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**THE BATH STONE FIRMS, Limited.**

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**COLLINGS' PATENT HINGE**

LEVER, SCREW, & BARREL BOIL

Self-Acting "FALL DOWN" GATE STOP

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AT MUCH LESS COST THAN BY GAS. + NO STEAM OR AIR-PIPES REQUIRED

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There are still a few districts in which we are not yet represented. Correspondence invited.



# The Builder.

VOL. LVI. No. 2401.

SATURDAY, FEBRUARY 9, 1899.

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### What is meant by "Durable" Stone?



CONSIDERABLE difference of opinion exists as to what may, or may not, be called durable stone. One individual may be clear that a certain stone is a good one to withstand the

action of the weather, whilst another is equally convinced to the contrary, and to a certain extent they may both be right in their judgment.

The manner in which a stone behaves after it is built up so very much depends on surrounding circumstances that the nature of the locality of the building must always be an important factor in considering the durability of a freestone. Yet how often is this thought of? To a certain extent it is recognised that there are freestones which do very well for the country, but which will not withstand the London air, and few people get beyond this; whilst only a very small section seems to appreciate why even such a difference as this should be made. For example, the majority say that, in order to judge whether a certain stone would be durable in London, or any other large city, it is necessary to go to the place where the material is quarried and examine the buildings in the vicinity, especially ancient ones, and, if there are many signs of decay in the stone, it may be taken for granted that it will not do for London. Now this by no means follows. In the first place, it is nearly always extremely doubtful what is the particular kind of stone an ancient building is made of. The edifice may be in close proximity to a quarry, and yet may not be constructed of the stone from it. Many stone-merchants' circulars and statements are very misleading in this respect. The material used for the ancient building may, superficially, appear to be exactly the same in tint, grain, and every other characteristic as that in the quarry hard by, yet it may have come from another source; it may not be far off, but quite far enough to make a considerable difference in the structure of the stone. In a distance of a few hundred yards, the tint or grain of a stone may not be altered; but it may, nevertheless, have undergone a considerable change, by the absence or presence of a filtrating or cementing material, which is the fundamental part, constituting

the very essence of its durability. And, in many instances, nobody could prove this alteration without making the most minute examination. Unless the individual conducting the inquiry is armed with proper scientific apparatus, it is astonishing how easily he may be deceived on a point of this nature. It is necessary to be very careful, therefore, in admitting the enduring qualities of a stone from mere superficial examination.

Certain other elements creep in, tending to make the comparison of the ancient stone with that in the quarry still more doubtful. For the purposes of argument we will assume that the ancient building really was made of the stone from the contiguous quarry. Leaving on one side the possibility of the quarry having been expressly opened for supplying the material for the building in question, when bad surface stone would probably be more or less used, we are nearly sure to find that the freestone was taken from all levels, indiscriminately, in the quarry. As a rule, four or five beds of stone occur in a quarry, frequently having a certain resemblance to each other, but which are none the less of different qualities, as is usually shown by the stone-merchants' price-lists. If, then, the ancient structure be built of stone from various beds, how can we expect it to furnish us with much information as to the durability of the material, which the proprietor now only sells from the more marketable levels, whether they be good or bad? It is obvious that an entirely erroneous impression may be created in regard to durability unless we recognise these facts. A case has recently come under our observation which abundantly illustrates this point.

Within the precincts of a certain village, stone-quarries were re-opened which, for many centuries, had supplied material for all the important buildings in a neighbouring town, and for many miles around. Some of the edifices, which are at least 700 years old, show that the stone of which they are built has resisted the ravages of time in a most marked manner. A general report on building stones alludes to this fact, and laments that this very enduring material is not more extensively used. Now, this is all very well so far as it goes; but, unfortunately, on investigation, we find that the stone used in the buildings referred to can no longer be obtained,—or, rather, it can be obtained, but at prohibitive prices. The facts are as follow:—There are at least four different kinds of stone in the quarries in ques-

tion. Of these, one is an altogether worthless material, so far as its power of endurance is concerned; two others are fairly durable freestones; whilst the fourth kind is very durable, though hard. The ancient buildings in good preservation are largely made of the last-mentioned variety; but it costs so much to work and shape that it is now practically unmarketable, and the ordinary produce of the quarries is almost entirely restricted to those of a fairly durable description. At the same time, the stone merchants take credit for the better class of material; and it would not be difficult to cite other cases of a similar nature.

Another element worth considering is as to how far railways and increased facilities of carriage have affected the selection and use of building-stones. Several important durable freestones, largely used in the Middle Ages, have more or less dropped out of the market, apparently because their distance from railway or convenient water carriage has enabled competitors more favourably situated to place a somewhat similar material in the market at a much cheaper rate. And it is instructive to note that in several districts where the "iron horse" has been but recently introduced, some of these old quarries have been re-opened, and the stone industry revived.

When we hear of the great care with which many of the earlier architects selected their stone, we are tempted to inquire whether their clients' unlimited purses, or the absence of the demon competition, had not something to do in bringing about such a favourable result. In this connexion, however, it is well to bear in mind that unless durable material had been originally used, the chances are that we should have nothing left of the buildings to enable us to form an idea on the subject at all.

Comparatively modern cottages in the vicinity of a quarry, even when they are known to be made of the produce of the working, do not often afford a very sure index of the durability of the stone in the quarry, albeit we know that they are frequently believed to be good examples to study in this respect. As a matter of fact, such cottages are often made of quarry "refuse," which, in the majority of cases,—especially in a sandstone district,—comprises hard blocks of stone which could not be easily toolled, and hence have been thrown aside. It frequently happens that the greater portion of this "refuse," therefore, is exceedingly durable,—much more so than the ordinary produce of the workings. This "refuse" is also very largely used for walling, &c.



Our remarks hitherto are made to apply irrespective of locality. As we said at the outset, the *locale* of a building remarkably influences the durability of the stone of which it is built, and we have reason to suspect that differences of opinion in regard to the weather-resisting qualities of certain well-known stones in a great measure arise from the non-consideration of this circumstance. For instance, we are all aware that the amount of rain which annually falls in England varies very much according to the district, and that in the western counties many places receive three or four times—and in some parts of the Lake district six times—as much rain as eastern and south-eastern England. This means that in the more rainy districts, much greater proportions of the acids which combine to rot ordinary freestone are introduced into the walls through the agency of rain and moisture generally than are introduced into them in the drier areas; and, *ceteris paribus*, the rate of disintegration of the stone will consequently be very much more rapid in the former than in the latter districts. Here, then, we have a most powerful factor, influencing the comparative durability of stone, which is hardly ever taken into account; and it is a fact that a stone which may be durable enough for a moderately dry district will be quite unfit for a more rainy area, where the agents of destruction are present in much greater force.

Furthermore, the distribution of rain is extremely capricious, depending as it does so much on local circumstances. The precipitation is effected to a great extent by the trend of the valleys, so that the difference is not the same in proportion in adjacent valleys, or, indeed, on the different slopes of the same hill. Trees are great attractors of rain, more particularly on elevated ground, and a mansion-house built near a forest or large clump of trees, under certain conditions, receives a much greater quantity of moisture than one not so situated, even though they may not be far from each other. As hills and mountains also, by chilling the air in contact with them, cause the condensation of moisture in the atmosphere, so there is generally a greater rainfall in their neighbourhood than in the less elevated portions of the country around, and buildings erected near such high ground will suffer accordingly. Questions may fairly arise respecting the comparative durability of stone to be used for building in such cases.

The position of an edifice, as to how far it is sheltered from the prevailing winds, and with reference to the direct action of sunlight upon it in drying-out moisture from the stone, should always be considered in a critical enquiry. And this leads us to perceive that the design of the building itself may also materially influence the rate of disintegration of the stone of which it is built.

The distribution of temperature must likewise be taken into account, and especial note made of places where the temperature very frequently falls below the freezing-point, or which are subjected to great diurnal changes in temperature. It is not easy to get much precise information on these points. Isothermal charts give the monthly or annual range of temperature in a district, and we are enabled to find that it is much warmer, as a rule, in the western and south-western than in the eastern and south-eastern portions of England. But these charts are necessarily drawn up from averages. We are not so much concerned with average temperatures. What we want to know are the maximum and minimum daily temperatures throughout the year for any given spot, and this is not obtainable except at certain fixed stations. According to isothermal charts, a district may have a tolerably low annual or monthly average temperature, which fact might lead us, at first sight, to suppose that the freezing-point was more often reached there than in another area having a somewhat higher average; but, although this may be true in a general sense, the con-

verse not unfrequently is the case. The durability of stone is not materially affected by temperature, unless the latter often falls below the freezing-point, on the one hand, or unless great changes frequently occur in its diurnal range, and this will be felt the most where the change is most rapidly brought about, on the other hand. In the former case, the water retained in the pores of the stone is frozen, the formation of the ice causing an expansion which loosens particles of stone, which fall from the parent mass on thawing, unless their cohesion be strong enough to resist the expansion. In the latter instance, the rapid contraction on sudden cooling causes portions of the material to split off. This phenomenon is of such frequent occurrence in certain parts of the United States that its consideration is of primary importance in selecting stone in that country.

Turning now to the relative value of stones in regard to their durability in towns, it will be at once seen that not only have many of the foregoing facts to be considered, as to the position of the buildings, rainfall, temperature, &c., but the nature of the town itself must form a prominent feature in the inquiry. If it be a quiet old cathedral city, with a non-manufacturing population, its building-stone will last very much longer than in another city of the same size having many manufacturing factories, and especially if these latter be pottery or chemical works. The amount of carbonic, sulphuric, and hydrochloric acids (communicated by these industries to the atmosphere) is far greater in the latter than in the former kind of town, and the rate of disintegration of building-stones in it will be correspondingly increased.

If the city be very large (as London, for example), it will be found that the stone in certain parts of it lasts much longer than in others,—a circumstance largely due to the absence or presence, as the case may be, of certain kinds of manufactories in the immediate vicinity.

The due consideration of all these facts will go a long way to explain why one man finds that a certain stone is durable, while another has the contrary experience. The former may be accustomed to using the material in localities comparatively favourable to its preservation, whilst the work of the latter may oftener lie in more unfavourable districts.

Some differences of opinion also unquestionably arise owing to the word "durability" having a very elastic meaning, which may be expanded or contracted at the will of the individual. But this does not do away with the fact that the same kind of stone often behaves very dissimilarly under different conditions, which conditions do not seem to be sufficiently taken into consideration when opinions are formed respecting its durability. This is especially the case in regard to the building-stones used in the provinces.

In the preceding remarks we do not, of course, allude to buildings made of different qualities of each kind of stone, but have assumed that the stones compared under separate local conditions are in each case from the same quarry and stratum; and in doing this we are quite within the mark, for it is not difficult to institute comparisons of the kind.

From a study of the subject, we have come to the conclusion that although many people recognise the advisability of carefully selecting stone for London use, they do not fully appreciate the advantage of exercising the same amount of care in choosing the material for provincial residences, where the surroundings may prove quite as unfavourable to its preservation.

**The New Finnish House of Parliament.**—The commission appointed for considering the designs for a new House of Parliament at Helsingfors, to which we have previously referred, has decided upon accepting that of the Swedish architect, Herr Nyström, of Stockholm.

## A PROBLEM IN THE BRIDGING OF NAVIGATION WAYS.

**T**HE Clyde in its conditions below Glasgow Bridge bears a general resemblance to the Thames below London Bridge, with, however, one or two points of notable difference. It is a tidal harbour, filled with shipping for about two miles downwards; but, unlike the Thames, is lined on either side with uniform quay walls, which the water never leaves, even at the lowest of neap tides. The bulk of the loading and unloading of ships is performed at these quays direct, and there is no lighterage traffic,—at least, none in the Thames sense. Here and there, carved out of the river margin, there are accessory docks or harbours, all of comparatively recent formation; but these, as compared with the river itself, are not at all in the preponderating proportion, and the ruling feature of the port is the clean-cut channel of the Clyde itself, furnished throughout with unbroken quayage lines. The left bank, for a considerable distance off to the south, is level, and of small elevation above high-water mark; the right bank is flat also, although by-and-by diversifying into a rise on a moderate gradient. During the last three or four decades the city has extended enormously over both these areas. On either side engineering works and general factories abound, and the affinity, in habit and pursuit, between the two is much more marked than in the London case. The daily and hourly interchange of traffic is naturally large of bulk, vehicles going round eastward by Glasgow Bridge or westward by the horse-ferry at Govan, while passengers are served by small but nimble steam ferry-boats, plying at about half-a-dozen intermediate stations. This combination of service has long been pronounced eminently unsatisfactory by the riparian factory owners, an influential body of men, and for some years the cry for additional cross-river communication has been of frequent recurrence. These, if permitted, would simply bridge the port on the quay level, at one or two points between Glasgow Bridge and Govan Ferry, and accommodate the incoming and outgoing harbour traffic,—or make a feint of accommodating it,—by the expedient of a lifting span in the centre of the structure. But, however desirable in itself, improved cross-river communication between the two sections of below-bridge Glasgow may be, it would certainly be too dearly bought, to the community at large, by the practical spoliation of the harbour and magnificent sea access which have contributed so largely to make the city what it is. This, hitherto, has been the guiding conviction of those in whose care lies the conservation of the port and river, with the result that the low-level bridge plan, after several bold attempts, rests for the time virtually defeated. The Clyde Trust would, of course, resist any scheme of the sort to the death, and as the Clyde Trust is, in its personality, almost identical with the City Council, it will be seen that the only chance of these bridge-promoters lay in the future passing through of a measure at a time when public and official attention was elsewhere engrossed. This seems past hoping for, and they have now become reconciled, it would appear, to the next best admissible expedient. The impression that something must be done being pretty generally diffused among all sections of the citizens, it is now all but certain that within a few months some plan will have been decided on. Several debatable schemes have of late been under irregular discussion, the low-level swing-bridge alternative having for the time practically disappeared from the field. Plans for a high-level crossing have been advanced by Mr. Arrol, of the great Forth Bridge undertaking. This would rise sufficiently to clear masts of ships; traffic would ascend to it by an inclined way, beginning at the bridge-end on either side, and rising in a quick but practicable gradient, while proceeding laterally on a line with the quay, some hundreds of yards away



from the crossing; afterwards, by means of a sharp bend, returning and forming junction with the roadway of the bridge, the necessary elevation having by this time been attained. For this design it is claimed that, considering the rather imperative conditions imposed, there is very little actual quay-space taken up, and the drawings bear this out so far; but, besides the unsightliness of the whole as a prominent river feature, it is very questionable whether any but the stoutest-hearted of traffic would prefer these filling inclines to the longer, but less-exciting, round, *via* Glasgow Bridge or Govan Ferry. A system of tunnelled roadway has been discussed, and to perhaps rather more of present purpose, steps having already been taken towards the introduction of a Bill at an early date. This scheme, which is privately, not officially, promoted, contemplates twin tunnels, of 15 ft. to 18 ft. diameter, for the wheel traffic (with an accompanying smaller bore for pedestrians), at a suitable depth below the water level. Shafts, with gearing on the hydraulic-lift principle, would lead to and from these for the accommodation of the carriage traffic, and stairs also for descent and ascent by foot-passengers. A scheme of this kind necessarily places a fixed limit on the depth of the port, and for this reason watchful opposition on the part of the Clyde Trust may be reckoned on. This is, perhaps, the chief objection; otherwise, some of its advantages are undeniable. It reduces interference with the existing port traffic to a minimum, and is in this respect distinctly preferable to bridge and ferry alternatives alike, no matter how carefully solicitous the designers of the latter may have been. Still, all high-level bridge and tunnel proposals bristle with inherent drawbacks, and these are deemed so formidable that many have turned to ferry transit, on the most improved system, as after all the least objectionable solution. Several plans have been put forward, and one of these found place in last year's Exhibition, although in a position so obscure as to be practically overlooked. By general consent, the desideratum is a ferry-boat which will receive wheel traffic from the level of the quay at all times of the tide, and allow the same to similarly walk away on the other side. It is claimed that this has been attained by a vessel fitted with a movable traffic deck, which will rise with the fall of the tide, and fall with the rise of it, so as always to present a level identical with that of the quay, and as already exemplified in several working examples. This seems to offer a solution which, on the whole, is less beset with objection than any other. The system would necessitate watchful eyes on the part of the up-and-down navigation, but already the numerous passenger-ferry crossings compel constant watchfulness; and, besides, whatever may be the expedient adopted, the interests of the navigation must give a little as well as take a great deal. If they are delivered from such a congestion of the port-passage as the threatened low-level swinging-bridge contrivance would certainly bring about, the Clyde Conservancy authorities may well make up their minds to a toleration of the occasional impediments due to the cart-ferry crossing system, even although that institution be set up in the busiest portion of the harbour.

## NOTES.

THE London County Council cannot be said to have begun its career in a manner that promises very well for the future. After all that has been said about the importance of its being a non-political body, and the absolute unsuitability of importing politics into the proceedings of a Council which is elected for the purpose of carrying out important practical work, the opening meetings have revealed the dragon of political party spirit in an obviously rampant attitude. Even the women's rights question seems likely to be ragged in by the presence of two ladies who probably have not the slightest acquaintance

with the subjects which ought to form the main business of the Council; and Mr. Firth's silly attempt to set the fashion of addressing the Council as "Ladies and Gentlemen," instead of addressing the chair, was obviously the demonstration of a sympathising "progressist" to bring the presence of the lady members prominently in evidence. Miss Cons, who has been elected an Alderman (or Alderwoman), is a lady of very businesslike ability, which has been evidenced in her management of more than one large philanthropic scheme, and if ladies are to be admitted, none could have a better claim; but the passing over in the election of Aldermen of such a man as Sir Douglas Galton, who has so much of the precise kind of knowledge, experience, and ability that a County Council is likely to stand in need of, is a piece of sheer stupidity, the more noticeable in comparison with some of the very inferior candidates who have been pushed in for mere political reasons.

TWO cases under the Employers' Liability Act, both rather curious in their circumstances, were decided on Tuesday. Both were hearings on appeal, before Mr. Justice Denman and Mr. Justice Hawkins; that of *Perry v. Brass & Son* from the Southwark County Court, where the jury had been unable to agree; that of *Hooper v. Studds & Son* being an appeal by the defendants. In the first case, the plaintiff, a painter, was working under the defendants' foreman Scrivener, at the General Post Office, and, asking for a ladder, was referred to a foreman in the employ of the Office of Works, who produced one, which broke while plaintiff was on it, and caused him a fall and injuries. The facts that the ladder was unsafe and that the plaintiff was injured through its giving way were not disputed, but unfortunately for him (in one sense) the ladder was not the property of his employers, and it is pretty clear that the plaintiff, being unable under the Act to proceed against the real owners of the ladder, who were not his employers, proceeded against the latter in the hope of getting damages illegally from a sympathetic court. We may be sorry for the plaintiff's accident, but his procedure against Messrs. Brass & Son was perfectly unjustifiable, and judgment was, of course, given for the defendants. The moral of the case is that workmen wishing to be protected under the Act should use their employers' plant, and not that belonging to other persons. In the second case referred to, *Hooper v. Studds & Son*, the plaintiff was working on a scaffold on the exterior of a building which was being taken down, when the ceiling inside fell in, and the plaintiff, alarmed by the noise of something falling, ran inside for shelter, when fragments fell on him and injured him. In the first trial the plaintiff obtained 80*l.* damages, against which defendants appealed, on the ground that the giving way of the ceiling was not a defect in their plant. The judges on appeal, however, thought that there was evidence of defect in shoring:—

"The Court suggested that it was a case in which it would be desirable, if possible, to come to some settlement, so as to spare the parties the expense of further litigation. If the Court should think the evidence unsatisfactory, then there must be a new trial. And here the injury arose to the man indirectly through his having gone inside the building; and then a difficult question arose, whether the building itself was part of the ways, works, or plant, so as to come within the Employers' Liability Act, and on that there would probably be an appeal allowed. In mercy to the parties a settlement was suggested."

Plaintiff's counsel left the matter in the hands of the Court, and the Judges thought the damages should be reduced to 20*l.*, and each party pay their own costs. No doubt the plaintiff running inside the building indirectly brought the injury on himself, but this can hardly be called "contributory negligence," being rather an intuitive movement of self-preservation under a sudden sense of danger. The point of interest in the case is as to whether an accident of that description really comes under the legal definition of "defective plant," a point on which the

learned judges seem to have been undecided, though their opinion evidently leaned to the affirmative. Morally, no doubt, the defendants were responsible.

SOME very interesting discoveries have just been made at the Church of St. Olave, Old Jewry. Owing to the parish having been united some years back to that of St. Margaret, Lothbury, it was decided that the Church of St. Olave should be pulled down, and its endowments utilised in the erection of an ecclesiastical edifice in some suburban district, the monuments and certain other interesting features being removed to St. Margaret's. The Church of St. Olave Jewry is a rather plain, but excellently-proportioned, building, and its interior is certainly not one of the least pleasing of Wren's works, though, for some reason or other, its effect was rather injured by the western organ-loft being brought so far forward into the nave as to rob it of more than one-third of its proper length; and although the loft was a handsome piece of work, the interior looks really finer without it. Before pulling the walls of the church down, it became necessary to make several rather deep excavations under the pavement at the west end of the building, in order to remove the vast aggregation of human remains which had accumulated, the result of the practice of intramural burials which had been here carried on for many centuries, and it was this work which has brought to light the discoveries to which we have alluded. It is evident that Wren built his church, to a great extent, upon the footings of the earlier one, which was destroyed by the Great Fire in 1666. This is especially to be seen at the west end, which appears to have been erected upon a portion of the old walls. The tower of the old church stood at its south-west angle, at the end of the south aisle, and its western wall was on the site of a portion of the west end of the present church. The bases of two old responds have been found *in situ*. One, which is fourteenth-century work, formed a part of the eastern tower arch; and the other, which is Perpendicular in style, was the western respond of the arch which opened into the nave from the north side of the tower. Below the tower is a plain vault, or crypt, which appears to be of the same date as the tower itself (*i.e.*, the fourteenth century). Some 7 ft. or 8 ft. below the pavement, at the west end of the nave, a very large, roughly-built Gothic arch has been brought to light; it is about 18 ft. in span, and is very acutely pointed; the voussours are uncut, and nearly 3 ft. deep. The form of the arch is very [similar to those of Old London Bridge, and it is evident that it must have spanned a stream or sewer, because at right-angles to it, under the north wall of the nave of the existing church, is a brick arch, probably not earlier than Wren's time, but constructed of early red bricks (very long and narrow in form). Now, it is evident that this stream or sewer must have passed obliquely under the church, or have made a bend at this point, and it was probably one of the streams which, like the "Wall Brook," took its rise in the morasses about Finsbury and Moorfields, and flowed through the City into the Thames. The Gothic arch cannot date later than the fourteenth century, and may be as early as the close of the twelfth; the rough hammer-dressed voussours and thick mortar-joints seem to indicate the earlier date. A cinerary urn of fine black clay was thrown up by the workmen near this spot, but, alas! broken in pieces. It appears to have been of a very elegant form, and is certainly Roman in date.

WE may, perhaps, be allowed to hope that the "Chalkotheke" of the Athenian Acropolis has at last found rest. The unfortunate building has been driven, by the gad-fly of archaeological theory, round the whole circuit of the Acropolis. Originally supposed to have stood at the south-east corner of the Acropolis, when the present



excavations began its site was moved to the north-west, close to the Propylea. The foundations found there (see the plan published in the *Builder* for February 26, 1888) are now held to be too small to have belonged to a building which was to hold the great number of bronze objects mentioned in the existing Chalkotheke catalogues. Also the bronzes found on that spot, which led to this identification, lay beneath the building, and must, therefore, have been older. The "Chalkotheke" is now to be identified with some foundations found recently in digging through the space intervening between the Parthenon and the precinct of Artemis Brauronia. The foundations are of a stoa-shaped edifice, 41 metres long by 15 broad, faced by a row of columns, the foundation for which still remains. So far as we are informed, there is nothing to prove whether the building be the Chalkotheke or not, but the fact that some of the "Chalkotheke" inscriptions were found on this very (so-called) Ergane terrace is in favour of the identification,—an identification which has the support of Dr. Dörpfeld. A far more interesting matter, however, than any Chalkotheke identification is the fact on this "Ergane" terrace a large, substantial building has certainly once stood; a building, too, from its plan necessarily of some secular import. It cannot be itself a temple of Athene Ergane, and as it occupies the ground there can have been no such temple at all. Dr. Dörpfeld always prophesied that when the supposed precinct of Athene Ergane was excavated no temple would be found. The result has more than justified his views. Not only is no temple found, but no temple could have stood there. This is, of course, a fact of the utmost importance with reference to the much-contested lacuna in Pausanias (I. 24, 3). The discovery does not, indeed, prove that Pausanias saw the "old Athene temple," but it at least proves beyond dispute that he did not see the temple of Athene Ergane.

FROM a report by Dr. Airy to the Local Government Board (just issued, but dated December 12, 1888) on the prevalence of diphtheria in the northern outskirts of Norwich, it appears that the sewerage system of that town is in a by no means satisfactory state. The disease has been most manifested around the high-lying portion of the existing sewer system, especially in and about Philadelphia-lane, a long street of houses inhabited principally by the artisan class.

"In 1884 this street was provided with a sewer, which forms the highest branch of the northern low-level division of the Norwich sewerage system. The highest point of the sewer at the top of Philadelphia-lane is about 80 ft. above the river. The northern low-level main sewer takes the drainage of the whole of that part of the city which lies on the left bank of the Wensum (the Coslany and part of East Wymer sub-districts); it has very little fall; it is carried under the river at Foundry-bridge (the bridge by which Norwich is entered from the Thorpe railway station) to join the southern low-level main sewer, which, after receiving all the sewage of the main part of the city lying on the right bank of the river Wensum, passes on at a great depth, admitting large quantities of spring water from the drain in which it lies, to the pumping station at Trowse, where it delivers into a sump 20 ft. below the river level. The influx of spring water into the deep outfall sewer (owing to defective construction) is so great (more than equal to the bulk of the sewage proper) that the pumps cannot master it, and the sewage in the sump generally stands only about a foot below the level of the river. This means that the whole of the low-level main sewer, and any of its branches that lie deeper than 1 ft. below the river level, are necessarily choked up to the crown with sewage that is nearly stagnant. It follows that the air in the higher branch sewers and drains connected with this waterlogged low-level main is dangerously charged with the effluvia of the stagnant sewage, and is itself nearly stagnant, there being no air-thoroughfare in the main sewer to aid the circulation. Moreover, the construction of the branch sewers themselves is such as to increase the foulness of the sewer air, for they are furnished at intervals with catch-pits (or 'silt-pits') at the manholes, which retain solid sewage matter with the silt, and thus become so many stinking cesspools, defeating the primary object of a sewer, which is intended to remove at once any refuse matter, liquid or solid, that is com-

mitted to it. I saw one of these silt-pits being emptied, at the bottom of Philadelphia-lane. Two loads of black stinking matter were removed from it."

Some quotations appended from the City Engineer's report of 1887 imply that there are a number of old brick sewers which ought to be replaced by proper stone-ware drains. "These," says the Engineer's report, "are built of soft bricks, roughly jointed in common mortar. The bottoms (this is of great importance) seem to have been laid without mortar altogether, or else it has all been washed out since. The joints are consequently open." From one or two sentences in the report, we gather that the whole of the sewage is pumped on to sewage-farms at Trowse; there is no mention of any of it being discharged into the river; but it is certain that the Wensum, as we had occasion to notice in passing through Norwich in September last, smells very offensively at the portion just above the aforesaid "Foundry bridge." A little way below the bridge the pollution seems to be diluted away, as the writer sculled down stream from one of the boat-houses without noticing any smell from the water; but above the bridge the smell from the river was strong and offensive enough to render even a stroll along the bank disagreeable. Does any sewage go into the river at this point?

THE *Century Magazine* for February contains an article of some interest on "Slow-burning Construction," an expression which the writer, Mr. Edward Atkinson, substitutes for the common, but practically incorrect, expression, "fire-proof construction." The subject is treated from the standpoint of American conditions of building, and more particularly in regard to mill and factory buildings, which we gather have been fertile sources of fires in the States. After referring to the exceptionally high rates of insurance prevalent in America, the author asks, "How can this waste be avoided?" adding that "it is useless to suggest the construction of buildings modelled on those of Europe, especially of those on the Continent; we have not a general supply of the soft and easily-worked stones of which most of the buildings in Paris and in many other foreign cities are constructed;" and the cost of many other articles of building is heavily increased by taxation. Assuming that timber must enter largely into the construction of factories and other such buildings, the writer proceeds to point out, "from many years' experience in the construction of textile factories," how these may be made more fire-resisting. His main complaint against the average American factory building is in regard to its roof, the ordinary trussed and oiled roof forming a mass of timber at the top of the building with a space between roof and ceiling which is not open to inspection. The roof approved by Mr. Atkinson is a practically flat roof, with a very slight fall each way only, formed of beams resting on the walls and on intermediate supports, if necessary, the beams projecting a foot or two beyond the walls to form eaves, and covered with a roof of 3-in. planking laid from beam to beam, and covered, over the planking, with any exterior material that may be preferred. The author mentions "gravel-roofing, tin, or cotton-duck" (we do not know this latter material, under that name, at least); it is proposed to have thin roof-boarding on the thick planks, and, if the roof is exposed to great humidity within, "one inch of mortar between the planking and roof boarding." As to this last suggestion, however, it may be asked "what about dry-rot?" or is that pest of the builder less rampant in America? Roof-boarding with a bed of mortar below, and an impervious covering above, would seem to the English mind rather in a favourable position for the development of dry-rot. This condition, however, is not essential to the system. The same system is to be carried out in the floors, which are to be made of thick planking on beams, the result being that everything is exposed:

there are no concealed between-floor spaces, and no built-up eaves externally. Mr. Atkinson regards granite as being, in his experience, the worst of all constructional fire-resisting substances:—"In a recent fire in one of the factories insured under the supervision of the writer, a granite post, 12 in. by 12 in., was reduced to sand by the same fire that burned into a wooden post next to the granite less than one inch." This is quite in accordance with some English experiences as to the behaviour of various substances under fire. The article, though especially referring to American conditions of construction, is one which may be read with interest by English architects, and is illustrated not by mere pictures, but by scientifically drawn sections of construction, with practical notes appended. The fact of such an article, so illustrated, appearing in a popular magazine, is creditable to the good sense and breadth of interest with which the best American magazines seem to be conducted. We doubt if there is a single editor of an English magazine who would see the value of such an article. A practical man who were to offer it would probably be told it was "of no public interest."

THE Edinburgh Town Council have had before them a report of the Lord Provost's Committee relative to the amount at the disposal of the Council under the Reid bequest for the erection of a memorial to Bruce and Wallace. The Committee express an opinion that the amount of the bequest is inadequate to procure a worthy memorial of the heroes, and they, therefore, recommend that 2,000*l.* be voted from the "Monument Fund Account" towards the undertaking. The matter was re-committed. The Council had before them a requisition on behalf of some worthy people in Tunbridge Wells for leave to erect a monument, of Sicilian marble, in Greyfriars churchyard (the Campo Santo of Edinburgh), to mark the spot where "Greyfriars Bobby" is buried. There is already a memorial of "Bobby" in the form of a granite fountain and bronze figure, which was erected several years ago opposite the gate of the churchyard at the cost of the Baroness Burdett-Goutts. This monument elicited the remark from a visitor that the Edinburgh people were so anxious to have an excuse for erecting a monument that they sought for heroes amongst their dogs. The legend, which is by many considered apocryphal, is that "Bobby" for fourteen years would have no home but on the grave of his beloved master, until death removed the faithful sentinel. After some remarks, the offer to erect the monument was declined, with thanks.

DR. PARSONS'S report to the Local Government Board (dated January 7) on an outbreak of enteric fever in the Staffordshire division of the Stourbridge Rural Sanitary District ascribes the disease to contaminated wells. Dr. Parsons says "there are no sewers in the locality; slop-water is conveyed to the nearest ditch by open gutters, generally of rude construction, and often mere irregular trenches in the ground." The further conditions may be gathered from the following quotations:—

"The privies are of the kind usual in the district, with large and deep open middens, into which the roof commonly drips. They are often in a ruinous, dirty, and offensive condition. Pigs are kept in large numbers, and often near to houses; nuisances being apt to arise from accumulations of manure, and of 'wash' kept till putrid in tubs and brick cisterns. Most of the houses are supplied from wells, which are of considerable depth in the higher situations, but very shallow in the lower ground. The wells are not so constructed as to exclude top-soil soakings, and they have often within a few yards' distance sources of contamination, such as rough sewage gutters, privies, and pig-styes. From some of them samples of water have been sent to the county analyst, and these have all been pronounced contaminated and unsafe for drinking."

The action taken on behalf of the Sanitary Author-

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has been almost confined to the supply of disinfectants, and the cleansing and fumigation of the houses at the close of the illness. A few samples of water have been sent for analysis, and when they have been found that the inhabitants have been alarmed, but the polluted wells have not been closed, or, except in a few instances, has the tap-water been laid on. There is great reluctance in the district to incur the expense of taking the company's water, and on the ground of the poverty of the inhabitants the Rural Sanitary Authority hesitates to enforce its use."

**D. R. BALLARD'S** report to the Local Government Board (Jan. 7) deals with the causes of a fatal case of post-vaccinal erysipelas at New Humberston (Billesdon Union). The fatality is ascribed partly to purely medical causes, but partly also to the sanitary condition of the room in which the patient (a child five months old) was left. The following are some of the facts given in the report, to which a plan of the premises (No. 24, Clara-cottages) is appended:—

"The surface of the common yard of Nos. 22 and 24 is well paved between the sculleries of the two houses, and the rest of the surface of the yard is clean and free from accumulations. But along a yard wall on both sides was a caged run, occupied by a number of fowls, the floor of which run was encrusted, as is usual in such places, with rotten slits. The roosting-places for the fowls joins the scullery. At the end of the yard, about 10 ft. from the scullery door, which is the back entrance to the house, is the privy and ashpit of Nos. 22 and 24. The privy is an ordinary bricked privy, and the excrement in it was on a level with the brick floor of the privy. The ashpit is covered, but open all along its yard front. It is 10 in. below the ground level, and contained a small deposit (some inches) of liquid matters and decayed refuse. It had been emptied when quite full, very offensive a few weeks before my visit, and the residents at No. 22 complained to me of the unwholesomeness of the proceeding. It appears on inquiry that it is not the practice to empty these receptacles in New Humberston until they are thus covered. The Inspector of Nuisances, Mr. G. Harrison, informs me that, although a drainage scheme for the place is now in progress, the whole of what is known as New Humberston is unlined, except where temporary inefficient provision has been made by means of cesspools. I saw one of such cesspools with a wooden cover, and much complained of, in the neighbouring front yard. Nothing could be well worse than the condition of the roadway in the Victoria-road, along the whole of Clara-cottages, about the middle of which the houses stand No. 24. It is deep in slush and filthy mud, impossible to be crossed by a foot-passenger, and thoroughly clogged up by the traffic that takes place along it. The footway also is scarcely passable from unevenness, sloppiness, and dirt. The Inspector of Nuisances says that this street especially has been for years in a most unwholesome condition for lack of adequate proper drainage, on account of its cesspools, &c. . . . That New Humberston generally and the Victoria-road and Clara-cottages particularly should have been in this unwholesome condition is assuredly the fault of the Rural Sanitary Authority of Billesdon. Had the place been duly attended to by the Authority, and had they taken care that it was reasonably wholesome, this fatal attack of erysipelas would in all probability never have happened."

**THE** manifest improvement effected upon the façade of Edinburgh University by the removal of the parapet wall and railing, and the adoption of a like operation at the Tron Church, which is also improved by the removal of the surrounding enclosure. Sir James Gowans has moved in the Town Council that negotiations be entered into for the removal of the buildings around St. Giles's Cathedral. Enquiries of this nature are often detrimental to the effect of the building they are meant to protect, and are apt to become receptacles for idle paper, straw, &c. Their removal, therefore, is a gain, both in a sanitary and æsthetic direction.

**THE** old school of water-colour painters, that is content with broad washes and a few neutral tints, holds in abhorrence the use of pigments, and does not attempt bright colours, has few better living representatives than Mr. E. M. Wimperis, R.I., some of whose latest work is just now on view at Messrs. Dowdeswell's Galleries. Most of the pictures are broad sketches, on or about the subject of the Arundel and Pulborough, and have a charming air of having been finished at the spot, and not worked up in the studio

afterwards. The few more finished drawings are from scenery in the same open country, and chiefly represent broad sweeps of rolling down, with great vistas of open country beyond dying away into the blue distance. Mr. Wimperis excels in painting this kind of scenery, but some of the most successful efforts in the present collection are the scenes in the hayfield, No. 26, "Windy Weather," and 54, "Haymakers." No. 11, "On the Sussex Downs," is a successful specimen of the former kind of scene, and is a little more ambitious as to size and finish than the rest. No. 3, "A Lane at Pulborough," is a nicely-composed little picture, and so is No. 23, "Sheep in the Stubblefield." We like, too, particularly, No. 50, "The Ridge of Noble Down," and 70, "Gleams across the Marsh." Mr. Wimperis is evidently at his best when the weather is not so; his wind-swept reeds and hay-fields are full of graceful motion, and he is happiest when he can introduce his grey and purple cloud-shadows and broken lights.

**THE Dispatch**, an Edinburgh evening paper, has been taking an interest in the architecture of the new Free Public Library in that city. Our attention has been called to the fact that on the 18th of last month it published "A professional view" of the matter as a quotation from *The Builder*. The criticism in question is not from our columns, nor do we by any means agree with or endorse it.

ROMAN THERMÆ: THE BATHS OF CARACALLA.\*

BY PROFESSOR AITCHISON, A.R.A.

THE three classes of public buildings that are most characteristic of the Romans are their basilicas, amphitheatres, and baths. I will take the baths first, because they present more difficult problems in planning; and from their being vaulted, their construction must necessarily have required more thought and contrivance than open buildings, or those merely roofed with timber. There is this, too, that makes these Roman thermæ peculiarly interesting to Englishmen; it was known that Palladio had measured all the existing ruins of them at Rome, and drawn out restored plans, elevations, and sections, and almost certainly written a descriptive text, but had never published them. Richard, Lord Burlington, the architect who originally designed the front part of the building in which we now are, searched for these in Italy, and though the text was gone, he found all the drawings, but the plan of Agrippa's baths in the palace at Maserà in the Trevigiana; this place Palladio had built for Daniel Barbaro, the Patriarch of Aquileia, who published Vitruvius with his own annotations and Palladio's illustrations in 1567. Lord Burlington published in London mezzotint engravings of these drawings of Palladio in 1730, with a modest preface of one page in Italian. Temanza, who had written a life of Palladio, tells us that he had this one plan, which I presume he lent to Cameron, and which was published with the rest in London by Charles Cameron, architect, in 1772. Views of the ruins, as they then existed, were added, and the plans of those parts still existing are given in outline, with the dimensions in English feet, as well as outlines of the decorations at the baths of Titus and Constantine, from those at the palace of Augustus and Hadrian's villa; one circular ceiling of the last was reproduced by Giulio Romano at the Villa Madama. A subsequent edition was published in 1775. Both editions contained an essay on Roman architecture, the thermæ, and a description of each one in English and French.

Octavio Bertotti Scamozzi published the drawings in folio, with a text of his own in French, in 1785.

Many of the baths are to be found in Canina; there is a monograph on the thermæ of Acirippa by Count Nispi-Landi, and one containing fac-similes of Baldassare Peruzzi's sketches of the front part of these thermæ, by Baron H. de Geymüller, which also contains the fac-simile of some sketches of the baths of

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Diocletian in Renaissance days. Numerous drawings of the baths hitherto unpublished are in the library of the Vatican, of the Barberini Palace, in the Uffizi at Florence, at Borgo San Sepolchro, Leyden, Berlin, and probably elsewhere; there is, too, a plan of Caracalla's baths in Serlio's book.

I must here mention that Palladio and his successors turned nearly all the thermæ upside down. The fact of the Pantheon being used as a temple, and having a portico added to it, made them believe that the laconicum was a vestibule, though in the plan of the Baths of Trajan, called by Palladio the Baths of Vespasian, it is put the right way upwards. Cameron, with praiseworthy industry, searched out many passages in the Classics, and in Mercurialis, relating to exercises, baths, and bathing; but being even less familiar than we are with these subjects, and thinking he was bound to give to every room its name and use, rather obscured than enlightened the subject.

Abel Blouet, the celebrated French architect, re-measured the ruins of Caracalla's baths, and by the aid of Count Volo excavations were made by which he was enabled to throw more light on the subject. His celebrated book was published in Paris in 1828, in which he not only gave the ruins then remaining, but restored the whole edifice. Further excavations were made by the Italian Government when Rome again became the capital of Italy, which have given us fresh information. The whole of the basement was excavated, but refilled, and hitherto no plan nor section of it has been published; nor can any information on the subject be got, although I went to Rome for that purpose. I must, however, express my obligation to Cavaliere Buongoini for his kindness in accompanying me to these baths, and for showing me portions that are not open to the public. Since writing this, Professor Lanciani has been kind enough to send me a plan of the basement excavations that he saw.

It is necessary to enumerate the different purposes for which the thermæ were used before describing the buildings themselves. Their uses were various; they were gymnasia, i.e., exercising places for the citizens, and probably included schools for learning the various exercises and sports; a theatre or grand stand for spectators to witness the contests; as well as schools for professional athletes, cloisters to walk in, open spaces for some of the exercises, gardens and alleys of trees, lecture-rooms, halls for discussion, picture and sculpture galleries, and sometimes libraries; stores of oils, perfumes, unguents, and dust for the athletes and bathers; cold, tepid, warm, hot, vapour, and swimming baths, and possibly hot-air baths as well.

To some of these baths, fresh, sea, and mineral waters were supplied. In the baths, people were oiled, scraped, shampooed, shaved, plucked, singed, pumiced, and perfumed; and in them they sometimes took refreshments,\* and, seemingly, on occasions dined there. There were reservoirs for the water, shops or lodgings in the peribolus, and barracks for the vast army of slaves that attended to the bathers, the baths, the furnaces, the reservoirs, the gymnasia, the palestra, and the grounds. Workmen to repair and foremen to direct were probably resident there, and there certainly must have been vast stores of wood and pitch for the fires, stores for oil, towels† and strigils, possibly rooms for washing and drying the towels,—even before the baths were kept open of a night and lit up, which must have required stores for the lamps, and places for cleaning and trimming them.

As long as the Roman militia was composed of yeoman farmers, who got their exercise by ploughing, hoeing, reaping, and threshing, and their drill in the Campus Martius, gymnastics may have appeared superfluous; but when Greece was known and Greek literature was studied, generals and statesmen could hardly have overlooked Aristotle's statement that the early Spartans were the best soldiers in Greece, only because they were the first to use gymnastics; and when Rome became the metropolis of the world, and civil occupations afforded no exercise, the Romans took to heart the advice that "the wise preserve their health by exercise."

We do not know exactly what the solid day was, but as the baths originally opened at the eighth hour, 2 p.m., we may suppose that it was then over. Martial thus divides the day: the

\* Suetonius Augustus: Letter to Tiberius, sec. 78.  
† See Satyricon of T. Petronius, cap. 38, sec. 91.



first two hours for morning calls; at the third the law-courts began; Rome, he says, protracted her labours to the end of the fifth hour; in the sixth the tired rested, and all work was over at the end of the seventh. From the eighth to the ninth, he says, is enough for exercising in the palestra, and I suppose for the bath too; at the ninth they lay down to dinner, and at the tenth he read his book to his friends. The younger Pliny tells us that his uncle always got up from dinner in daylight during the summer, and in winter as soon as it was dark. Those who wanted their water hot had done their exercises by the time the trumpet sounded, or the bath-bell rang,—for their rough way of using the word “bronze” for anything made of it leaves us doubtful, though a bell was found in Diocletian’s baths.

Martial, who was a barrister, offers to meet his friend at two, take his exercise, and then bathe together; he also tells a friend, who was playing at ball when the trumpet sounded, that if he went on playing he would have to bathe in cold water.

Ball-playing was the favourite game. They certainly had four balls, perhaps five. The trigon, or little ball, stuffed with hair or wool; some think it was so called from one game being played by three players, who had each two balls, and this is said to be shown on some coins of M. Aurelius Antoninus coined at Byzantium. It was caught in the right or left hand, and he who could not use the left was not looked on as a player.

The harpastum, about which nothing is known, was considered to be a man’s game exclusively, as one of the charges against Philanis, the strong-minded woman, was that she played at the harpastum.

The pila pagana, a ball stuffed with feathers, like the old golf-ball, harder than the follis, and not so hard as the trigon.

The follis, or large hollow leathern ball, like our football, and possibly a little hollow leathern hand-ball, called follis pugilaris. The trigon, called “parva pila,” or “pila,” on which Galen wrote a treatise. From his description the game seems to have been that of “Catch who catch can,”—i.e., aiming at one and throwing at another, with a good deal of scrambling for the ball, when it fell to the ground. He says it is the best and least dangerous of all exercises, even than bowling; and as he had been doctor to the School of Gladiators in his native town of Pergamus, and had put his shoulder out by some exercise in the palestra, he was well qualified to speak.

Petronius, in his “Satyricon” (cap. 27), describes a game of ball with the players in a ring, Trimalchio, the bald-headed host, being one, and the other players being his slaves. The balls were green, and as soon as the one they were playing with fell to the ground it was picked up and counted, while another slave gave fresh balls from a leathern bag. The follis, or the big hollow leathern ball, with which they played at pallone, is shown on the coins of Gordianus, and it seems to have been played as pallone is now played in Rome, by striking the ball with a large guard on the right fore-arm. A blow in the chest from the ball is now considered at Rome certainly fatal, so Martial was probably joking when he says it only befits boys and old men, unless he was speaking of the follis pugilaris. Plautus speaks of kicking a man into the air like a hand-ball (follis pugilaris), and keeping him there with blows.

The regular exercises seem to have been running, wrestling, throwing the javelin and quoit, boxing, the pancratium (a mixture of boxing and wrestling), ball-playing, and jumping; but they also used dumb-bells and heavy plates of lead, the swing, climbing ropes, and indulged in dancing, holding their breath, and bawling as exercises, and also practised cutting or thrusting at a post with a sword. They, perhaps, exercised in the Corycæum; the Greeks certainly did, but what this exercise was is not precisely known, but it is believed to have been either striking at a hanging leathern sack stuffed with fig-seeds, olive-husks, flour, or sand, as our boxers do at a sack stuffed with shavings, or else it was pushed with force against an opponent, who returned it.

There was also the game of Troy, a sort of sham fight, by the boys of noble families, on horse-back. Whether any of the games were allowed to be played inside the bath proper we do not know. Celsus advises in certain cases exercise to be taken in the warm room (tepidarium) with the clothes on; but as Martial’s friend, the ball-player, was outside the bath,

and as the ball is mostly called dusty, we may take it for granted it was not played in the bath itself. In our English translations, “sphæristerium” is called a tennis-court, and from Pliny the Younger’s letters we gather that this was covered, and perhaps warmed, in his villas at Laurentinum and Città di Castello. Suetonius tells us that Vespasian was shampooed in the tennis-court attached to the bath.

I think we may even suppose that the mosaic pavement of the gymnasium was sometimes strewn with sand, or dust, for some of the exercises.

I have taken the baths of Caracalla as the typical bath, mainly because the ruins of the central part still exist in a comparatively perfect condition, even to some of the vaulting, while the other baths have been turned to different purposes or have mainly disappeared; of some, a few ruins only remain, and what remains of Diocletian’s baths forms the church of Sta. Maria degli Angeli, and also because Caracalla’s baths have been so carefully restored by Abel Blouet. With a few trifling exceptions, I have shown the plan as he gives it.

I have given my drawings of all the ruins of the baths restored by Palladio, in some cases completed from the parts exposed since his days; a tracing from one of the baths at Cairo, from Pascal Coste’s work; a gymnasium and bath at Ephesus, probably of Roman times, restored by Mr. E. Falkener; and a bath at Pompeii, and one in the island of Lipari, &c.

Caracalla’s bath is supposed by some to have been begun during the lifetime of Septimius Severus, as bricks with his stamp on them have been found there, though this proves nothing, as we can be by no means sure that all the bricks made during his reign were used up in his lifetime. The central building was mainly completed by Caracalla in 217 A.D., though there were additions, it is believed, to the peribolus by Hellogabalus and Severus Alexander, and it was restored by Theodoric about 500 A.D.

In a book on baths, published by Giunta, Venice, 1553, a letter from Theodoric to Aloysius, the architect, on the subject of the state of the Therme is given. The baths of Caracalla stand nearly north and south on the diagonal; the right-hand corner looking at its front is north; the whole enclosure consists of an oblong square, with large flat apses on each flank, and is about 1,108 ft. long, exclusive of the apses, by 1,060 ft. deep, exclusive of the reservoirs, i.e., about one mile round, and containing about 1,293,192 ft., or about 29½ acres, with about 1½ acres more for the reservoirs. A large portion of the grounds is now occupied by high-roads, vineyards, market-gardens, villas, and trattorias, and some of the reservoirs are now what the Americans would call cane-brakes; but as I am about to speak of the restored plan, I will use the present tense.

This platform is about 20 ft. above the ancient street, and is entered in front by four grand and four smaller staircases, beneath a portico extending the whole length; at the back of this portico are eighty shops or lodgings, two tiers in height,—the shops are continued a short way round the flanks, sixteen on each side. The portico stops on the flanks sufficiently beyond the shops to allow of shelter in entering each of the grand side staircases. A space equal in width to the two flights of the staircase is enclosed to form three halls, and the same width is continued as an open walk to the end. At the back of these open walks are the flat apses, each containing a palaestra and two large halls, with an open walk and a cloister at the back, and a staircase to the road outside.

In the centre of the back of the peribolus is a theatre, or grand stand (theatridion), for seeing the exercises and contests, and at its back is the reservoir, containing sixty-four tanks, about 49 ft. 6 in. long, 27 ft. 6 in. wide, and 30 ft. deep, with a cistern on the top. The whole of these tanks contain about 15,000,000 gallons of water, which was warmed in these baths by the sun, and by furnaces beneath the lower ones, which also had their sides lined with flues. At each side of the grand stand there is a palaestra, two halls, and four small rooms.

The grounds are laid out with trees and walks, open spaces, and seats, and there are shafts for lighting the basement.

The main central building is about 716 ft. long, by 367 ft. deep, with rather more than a semi-circle projecting at the back, about 164 ft. in diameter. The main building is roughly divided into three parts, i.e., a gymnasium on either side, with a front and two side entrances

to each. The centre, or bath portion, has also two entrances, with a large swimming-bath between them, and this seems to have been the solar cell of Ælius Spartianus. On the left of one and the right of the other entrance corridor is a hall about 50 ft. by 41 ft.; at the front and back of this are two smaller rooms, two stories high. One of them, towards the front, contains a staircase, 3 ft. 10 in. wide, consisting of two flights with half-paces. Each hall is called in Blouet the apodyterium, or undressing-room, but is, I think, much too small for that purpose, and if the bathers were obliged to leave their shoes, might have been shoe-rooms. One of the smaller rooms was supposed to be the elmothesium, or oil and scent store, and the other the conisterium, which contain dust and ceroma (a wax unguent) for the athletes.

The tepidarium was entered from the vestibulum at each end, and was an oblong with a central transept. It is 78 ft. 10 in. wide from wall to wall, and about 180 ft. long, with four recesses, each containing a bath, and with two labra or fountains in the transepts. From Celsus saying that exercise may be taken here with the clothes on, I think we must conclude that the tepidarium was used for undressing in, as Cicero says no one was allowed to go into the baths unless naked.

From the transept you enter a calidarium, cella media, or hot room, containing two baths, and from that you enter by two doorways into the huge domed laconicum, or hottest room, 116 ft. in internal diameter, with walls about 24 ft. thick. To the right and left of this principal entrance are two other entrances, both leading to a set of four rooms, the outer wall of which form the back or south-west front of the building; they are conjectured to be a hot bath, a tepid, a cold room, and a cold bath at the extreme end, opening also into the peristyle of the gymnasium.

The gymnasium at each end consists of three halls, between the side entrances. The central hall, with its apse, answers to the old ephebeum of the Greeks, which was the training school or gymnasium of the recruits from eighteen to twenty years of age, and was in the bath probably the school; and from the apse at the back of it there was a clear view through the peristyle, large exedra, vestibules, and tepidarium to the apse of the ephebeum at the other end.

Corresponding in length with these three halls of the ephebeum was an open paved space surrounded by columns, and corresponding with each entrance is a covered portico, or cloister, returning at the back of the columns, and facing the ephebeum and its halls. In the centre of this back cloister was a huge semi-circular exedra, about 80 ft. diameter, also paved with mosaic, and containing full-length portraits and colossal heads of celebrated athletes, alternating. Looking at the south exedra from the peristyle, there was a door to the right into the apodyterium, and two to the left,—the smaller one into the oil-store, or conisterium, and the big one into a hot-room, with a bath, probably the concamerata sudatio.

Including courts for furnaces and for lighting, and some very small chambers, these rooms form the whole of this vast space, with the exception of a vestibule to each gymnasium, with a room on both sides. The vestibule and its two rooms are to the front; they are called libraries by Blouet, but were more probably undressing-rooms for those exercising, as the space between the columns flanking the entrance-halls was merely enclosed by a low balustrade of marble.

With pardonable exaggeration, Amm. Marcellinus (Valentinian to Theodosius, 370-392 A.D.) describes Constantine as saying the bath at Rome were as big as provinces.

It may give us some rough idea of the size of the central building to compare it with some of our buildings in London.

It is about 150 ft. shorter than the river front of the Houses of Parliament, and about 92 ft. deeper, exclusive of the apse.

|                                                                | Square feet |
|----------------------------------------------------------------|-------------|
| The central building of Caracalla’s baths contains about ..... | 277,000     |
| Houses of Parliament .....                                     | 242,000     |
| Westminster Hall .....                                         | 20,800      |
| British Museum .....                                           | 244,310     |
| Law Courts .....                                               | 202,780     |
| Natural History Museum .....                                   | 154,800     |
| National Gallery .....                                         | 65,000      |
| Royal Academy .....                                            | 44,920      |

All its covered parts were solidly vaulted or domed, its grand columns were monolithic



I had written to Lord Savile, our late Ambassador at Rome, about these swimming-baths; but the reply came before my return from Rome, which he, too, had left. With a kindness with



which I am deeply touched, he wrote to Professor Lanciani, who had visited the Piscina during the excavations (1871 to 1873), extracts from whose letters he sent me, and from these it appears that tons of rusty T-shaped iron were found in the excavations, which he says were bolted together in the form of a St. Andrew's cross. These beams seem to have been the cores of the brazen girders; the roof appears to have been flat, and partly covered with concrete made of light pumice-stone, in which iron rods, about 2 ft. 6 in. long with T ends, were imbedded. It seems by no means impossible that there might have been hypocausts, open, glazed, or covered with glazed skylights, in the concrete roof. As the clear span is 76 ft. 10 in., and the roof was flat, we must not boast too much of our skill in the use of iron. I must conclude this description in my next lecture.

#### ARTIFICIAL ILLUMINATION.\*

THE three subjects of lighting, heating, and ventilation are so intimately connected that it is well-nigh impossible to separate them. In their combination, however, they form a subject so vast, and with such extensive ramifications, that it would be utterly impossible to discuss it in a single evening. I must warn you, therefore, at the outset, that I shall limit myself almost exclusively to illumination, and shall only allude indirectly to heating and ventilation. I will not weary you with any attempt to explain the undulatory theory of light, or to show that the phenomena of light are more easily explicable on that theory than on the emission theory, which obtained for many years. All that it concerns us to know now is that any body, when raised to a temperature higher than that of the surrounding air, begins to part with some of its energy, in the form of radiations. At low temperatures these radiations affect our sense in the form of heat alone, but when a temperature of something like 525 deg. Centigrade is reached, the radiations begin to be perceptible as red rays. With increasing temperature the radiations affect the retina, as yellow, green, blue, and violet rays, and when these are produced the combined effect is white light. It should be stated that nearly all bodies are fused before they can be raised to such a state of incandescence as to give off white light. The light which we enjoy and use, whether natural or artificial, comes, to a very small extent, directly from the light-giving body itself. On an ordinarily cloudy day we get sufficient light for all practical purposes without seeing the sun at all, and even when he is shining, every cloud, every hill, every building, and all the waving branches of tree and shrub catch and reflect back to us the light of the great luminary himself. Precisely the same thing occurs indoors with artificial light. This room is now simply lighted by the burners under the dome; but if the walls and ceiling were lined with black velvet, or some such substance, which would absorb and not reflect the rays of light falling on it, the dulness and darkness which would result would be astounding. You should, therefore, always endeavour so to arrange the positions of your points of light that they may have the maximum effect upon reflecting surfaces. Another point to be borne in mind is that upon the purpose for which any room is required depends the kind of illumination which should be given it. In a dining-room or billiard-room, for instance, all the light requires to be concentrated on the table, and the remainder of the room may be in comparative darkness, and the same thing applies where very fine work is done, and when the workman wants a concentrated light; but in the majority of cases a diffused light is required, and wherever it is practicable the flame itself of the burners should be hidden. I know of no more pleasant method of lighting than that adopted in the House of Commons, where all the gas-jets are placed above the ground-glass of a ceiling skylight. In this case the artificial light enters in precisely the same way as the natural daylight, and the eye is never wearied by the direct rays of a burner.

Now, with regard to illuminants themselves, leaving out of account for a moment the electric light, the light-giving flame from all of them is produced, not by the heating of any solid material to incandescence, but by heating gas to a high state of ignition. Whether we

use tallow, wax, oil, oil-gas, or coal-gas, in every case the light depends upon the existence in these substances of carbon and hydrogen, and upon the substances themselves being heated so that the gases pass off and become ignited in the presence of oxygen. The only difference between gas-lighting and other forms of illumination is that, in the one case, the gas is generated at a distance from the point where it is to be burnt. In the case of an ordinary candle it may seem strange to say that its light is due to the ignition of gas, but it can easily be shown that this is the case. The wick is only the vehicle for conveying the gas to the point of ignition, and the smaller the wick the better the light given will be. The flame of a candle, or of an oil-lamp, or of a gas-burner consists of three parts:—(1) the inner dark zone of unconsumed gas, (2) the luminous area, where the solid particles of carbon are being burnt, and (3) the outer zone, where the supply of oxygen is greatest, and the carbon is at once turned into carbonic acid, which is, of course, given off into the room. It is impossible to prevent the formation of carbonic acid, but the whole object of manufacturers, whether of oil or gas lamps, is to arrange the burners so that as little unconsumed gas as possible escapes, as this is all waste. As reference is frequently made to the illuminating power of oil-lamps or gas, it is as well to know that the legal standard of illumination in England is a sperm-candle, burning in properly-sheltered situations 120 grains of spermaceti per hour, and this is known as "one-candle power." In France, the standard is a Carcel lamp burning 42 grammes of pure colza-oil per hour, which is equal to about 9·6 candles.

When gas was introduced, all the oil-merchants and the lamp-makers raised an outcry that their trade would be ruined, much in the same way that the announcement of Mr. Edison's discoveries in electric lighting sent down temporarily the value of the gas companies' shares. As a matter of fact, the introduction of any new illuminant has two effects: first, it makes the public want more light; and, secondly, it puts the purveyors of the old on their mettle, and immediately they set to work to improve the old forms of burners. I should imagine that, notwithstanding all that gas has done and that electricity has done, there is more oil used for illumination at the present day than ever before, and the improvements in the way of burning oil are as great as those which I shall shortly mention with regard to gas. The oils used in lamps are either what are called the fixed fatty oils,—such as sperm, colza, and others,—which undergo destructive distillation, and are resolved into gas; or the fluid hydrocarbons obtained by the distillation of petroleum and various other substances. These are called the mineral oils, and they give off inflammable vapours which in badly-arranged lamps are frequently the cause of explosions. The earliest form of lamp was probably merely a shallow vessel, with a wick floating in the oil, and the first improvement was in making a chamber for the burning wick separate from the main body of the oil. The Roman and other lamps of this sort can be seen in nearly every museum. The wick was generally circular and solid, and consequently it sucked up oil throughout its whole substance, just as much at the centre as at the circumference; but, as the air could not get access to the flame at the centre, there was very imperfect combustion there, and much smoke and unconsumed gas were given off. This kind of lamp continued in use for centuries, and the result must have been dismal in the extreme. The first improvement consisted in having flat wicks, in which a much greater surface of cotton was exposed to the air, and, consequently, much less unconsumed gas was given off. It must be borne in mind that one of the most important points is to regulate the air-currents which support combustion, and I do not think it was till the eighteenth century that the contrivance of a sort of cone of metal was adopted, which was placed over the burner itself and had a slit in it rather larger than the mouth of the wick-holder. The air was introduced below the burner, and was directed against the sides of the flame, which would rise over the slit; slight variations of this form are now used in all kinds of lamps. In 1784 the invention of M. Argand was patented in England, and this form of burner must be so familiar to you all that I need only describe it very generally. It consisted of a hollow circular wick, and the

air was introduced into the centre of the flame as well as to the outside, so that far more perfect combustion took place. With both kinds of burners some arrangement for protecting the flame from outside currents of air is necessary, and in the first form of the Argand a metal cylinder came down over the top part of the flame; but it was very soon found that the best plan was to have a glass chimney, and, with slight alterations, this lamp has continued in use till now, and still holds its own as it has been adapted to gas. The most recent improvement in oil-lamps with which I am acquainted is a slight modification of the Argand burner, manufactured by Messrs. Jones & Willis, and called by them the "Cathedral lamp." In this the wick is circular, and there is a hollow tube conducting air to the centre of the flame, but the burning wick itself is not introduced into the oil, but is clasped to a separate set of cottons. Several other forms of this lamp are made. I must enter one word of caution with reference to this and any other invention that I may not see in this room. It must not for one moment be supposed that I am instituting invidious comparisons, that I consider the burners which allude to as absolutely the best, or that I wish to throw the slightest discredit upon any that I do not mention. It is absolutely impossible to make oneself acquainted with all new inventions, and I merely call your attention to what seems to me good, leaving you to make your own investigations as to what is best.

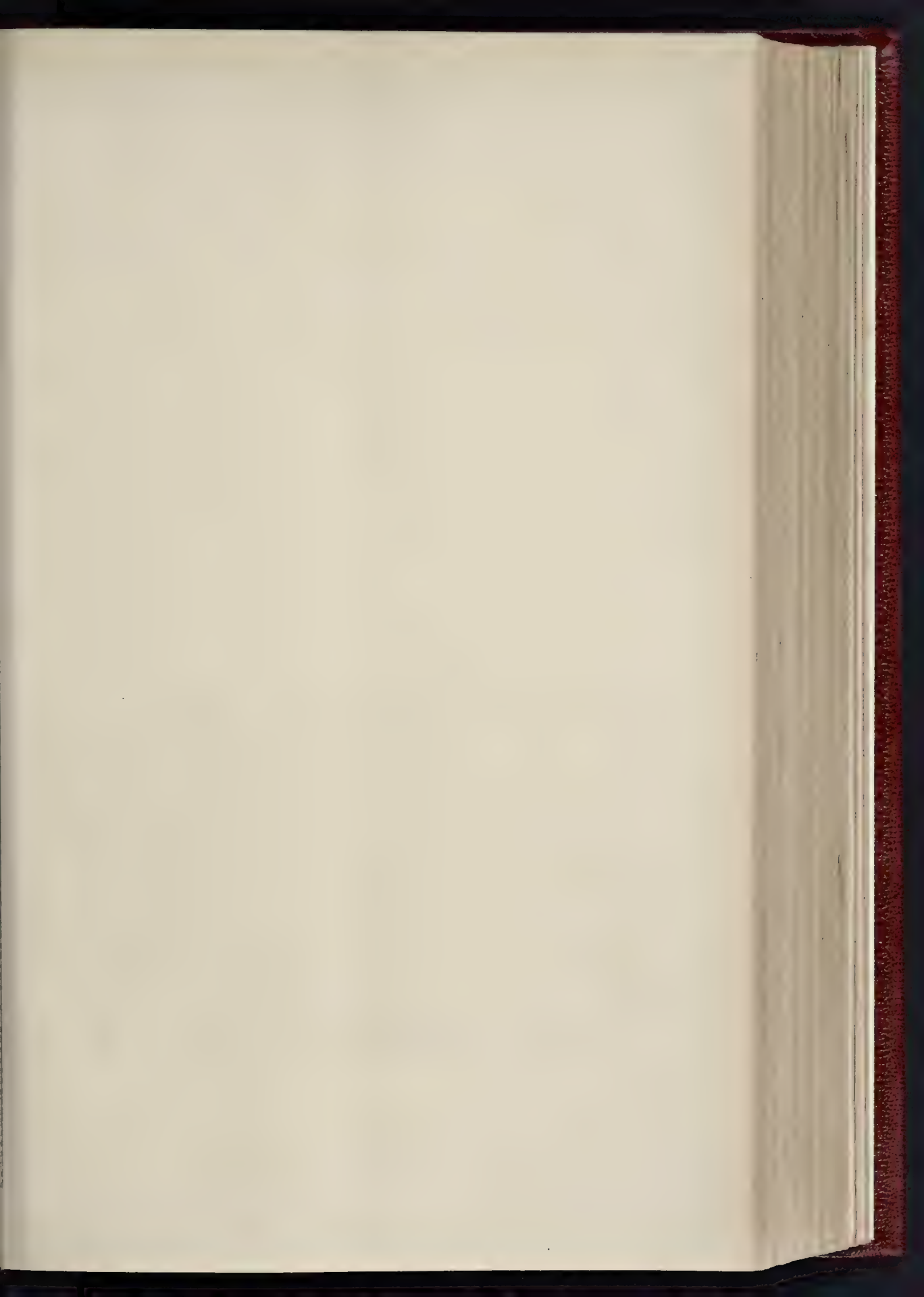
During the last few years several methods of burning the heavy hydro-carbon oils with the intervention of a wick, and also with the reducing of the oils to gas, have been invented. These oils are obtained from coal-tar, or petroleum, and the waste products of chemical manufactories, gas-works, &c., and are, consequently, very inexpensive. The "Lucigen" is, I believe, the first in the field of these inventions, and it is certainly a wonderful light for any open-air work, where noise is not objectionable. The general principle of the light that oil is forced by compressed air or steam through a very small nozzle, which is surrounded by another nozzle, through which air or steam of 15 lbs. is forced. Immediately above these nozzles is a large chamber, and the sudden expansion of the air divides the oil into a very fine spray which is easily ignited. The air passes round the burner in a spiral, so that before it reaches the combustion-chamber, it is, of course, necessary with this light to have a means of supplying compressed air, but it can be very easily arranged in building work of any magnitude, as here steam-engines almost invariably employed.

"The Wells Light" is on a somewhat different principle, no machinery for supplying compressed air being required. The oil-tanks are very much like those of the "Lucigen," but they are fitted with a hand-pump, so that the oil can be pumped in until the air which was in the tank is compressed to about 25 lbs. pressure. Just under the burner is a little tray in which tow or some such material is placed, which when the light is wanted. As soon as the burner is heated the oil is turned on, by the heat is converted into gas, and can be ignited, and the flame itself keeps the burner hot. The advantage which the "Wells" has over the "Lucigen" is that it is much more portable, and can be carried to places where it would almost be impossible to obtain a supply of compressed air, such as the "Lucigen" requires. A quantity of oil which is consumed by the light is about two gallons per hour, and cost is not more than 2d. a gallon; but, of course, the expense of keeping up the supply must be added to this. In any case, however, this is a very ingenious way of securing an extremely powerful light, of 3 or 4,000 candles, at a very small cost.

To turn from oil to ordinary coal-gas, it can be no doubt that we now get a higher value of light from the gas which burns than was the case ten years ago. We are so used to the burners which roared when they were turned up high, unless pressure happened to be very low, in which case it was well-nigh impossible to see to read. Improvements made have been twofold,—first, in the shape of the burner itself; and second, in the internal construction of the burner, making it self-regulating as regards pressure. Messrs. Suggs have always been foremost in the field in these improvements, and after great many experiments they have arrived at what they consider the best form for a

\* A paper by Mr. John Slater, B.A., F.R.I.B.A., read before the Architectural Association on the 3rd inst., as elsewhere mentioned.

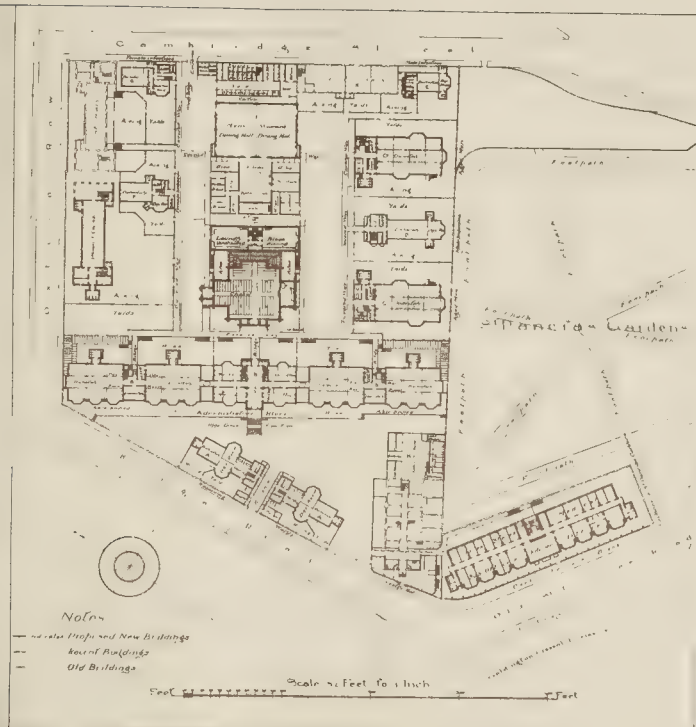






NEW BUILDINGS, ST. PANCRAS W









flame burner. When gas issues from a small opening at a greater pressure than is suitable for it, not only is roaring produced, but also more gas issues from the burner than can be properly consumed. Mr. William Sugg made the discovery twenty years ago that as the rate of velocity of the gas issuing from a burner increased, the illuminating power per cubic foot diminished. Hence the efforts of manufacturers were directed to regulate the pressure by an arrangement inside the burner itself. This has been done in all sorts of ways. The Peebles burner, the Parkinson governor, Sugg's steatite float-governor, among others, may be mentioned. Innumerable experiments have been made to determine the best form of the slit at the top of a flat-flame burner, and the best material for making the burner. Messrs. Sugg's circular slit table-top burner is now considered the best. The material now generally employed is steatite, a mineral of a soft, soapy character when in its original state, but which, after being burnt in a kiln, becomes harder than steel, and practically indestructible by heat up to over 2,000 deg. F. A good form of burner will give sixteen candles for a consumption of 5 cubic feet per hour. The Argand gas-burner, which is almost exactly like the ordinary oil Argand, now gives considerably over sixteen candles for every 5 cubic feet consumed. Some few years ago a new method of burning gas was invented, and I believe the late Sir W. Siemens was the first to introduce it in what he called the Siemens regenerative gas-lamp, of which the "Wenham," the "Cromartie," and the "Meteor,"—a German invention,—are modifications. In these burners the gas, instead of issuing from the burner in an upward direction, issues downwards from a number of very small apertures, and the flame curls over either in an outward or an inward direction. The flame is screened from the ordinary air-currents in the room by a glass shade under it, and the air for combustion is conducted to the flame through small holes well up above the light in the frame of the lamp itself. These lamps adapt themselves admirably to the ventilation of rooms, as, by means of a pipe or metal shaft above the ceiling line, all the products of combustion and all the vitiated air of rooms can be drawn off. Much more might be said of these burners.

In a quite recent invention Messrs. Methven & Sugg have improved upon this, and they have now perfected an arrangement by which the burning gas has a separate supply of air all to itself. This air is first dried,—as it has been found that water vapour in ordinary air is a great bar to obtaining the full illuminating power of the burning gas,—and then supplied to the flame at a pressure very slightly in excess of the ordinary atmospheric pressure. It is necessary that separate pipes be laid on to the burners for the supply of air, and that some means of obtaining the requisite pressure be at hand, so that for ordinary rooms and small installations the cost would probably be too much, but in large buildings where crowded audiences assemble the system would be invaluable. It can be seen in operation by any one who is interested in the subject at Messrs. Sugg's works, Regency-street, Westminster. Another form of gas-burner is exemplified in the Welsbach incandescent light. This, or a modification of it, was first shown at the Gas Exhibition at the Crystal Palace in the winter of 1882-3. In this a mixture of gas and atmospheric air is used, which burns at a high temperature, but itself gives out very little light, but it heats a thin framework of magnesia or some other substance to a state of incandescence, and gives off a very steady, pure, white light, with one very great advantage, that there is no smoke from the gas. The drawback is that the framework, or envelope, requires periodical renewing, because it is impossible to prevent it oxidising when burning in air, and unless it is very carefully made, small particles frequently fly off and fall. The Lewis incandescent lamp was on the same principle, but here a thin coil of platinum wire was brought to a state of incandescence.

You are all aware of the greatly increased brilliancy of any burning body if plunged into oxygen compared with its light if burning in air only. Quite recently a method has been invented of combining oxygen with gas or with an oil flame, and burning the two together. The oxygen is stored in receptacles of various sizes, and is led to the point where the light is required in very small tubes; a separate tap turns on the gas and the oxygen, and when they mingle an intensely white light is produced.



Monumental Effigy in the Church of Airth, Stirlingshire.

This is augmented by having a small block of some substance which can be brought to a state of incandescence suspended over the flame. This light is, I think, quite equal in brilliancy to the electric arc-light, but whether it will prove a commercial success I am somewhat doubtful, because of the increased difficulty and expense of leading a double set of pipes to the burners, and of having ready a supply of oxygen. But this difficulty is, of course, much less than that of supplying electricity, and I can very well believe that in many cases such a light would be invaluable.

The energy of chemical affinity is the cause of the light of all the illuminants which we have hitherto been considering, and I must now say a few words of the other great source of light which was discovered and shown as an interesting experiment nearly eighty years ago, and which, in the last ten years, has made such enormous strides, viz., the energy of current electricity. The science of electric lighting divides itself into two parts,—first, the production of the current, and second its conversion into light.

Electricity can be produced either by chemical or by mechanical means. If two dissimilar metals, such as zinc and copper, be immersed in some acidulated water and connected by a wire, a current of electricity passes through the wire from the copper to the zinc, and this forms a simple cell. A number of cells combined form a battery, and if the battery is strong enough, a thin conductor when brought into contact with its two poles can be made red or even white hot. In Sir Humphry Davy's experiment in 1810, 2,000 double plates of copper and zinc were employed, and when the wires connected with the two poles of this battery were attached to two pieces of carbon, and the circuit was completed, on the pieces of carbon being separated a brilliant light was produced. Dr. de la Rue connected together 14,000 cells, and obtained most powerful currents; but these cells were very expensive, and if electric lighting had to depend upon voltaic batteries it would never have reached its present development. Oersted's discovery of electric magnetism in 1819, followed in 1830 by Faraday's discovery of induced currents, led to the construction of machines which produced electricity by mechanical means, viz., by revolving coils of wire between fixed steel magnets. These machines were called magneto-electric. In 1867 came the great discovery which revolutionised everything, viz., that the residual magnetism in any piece of soft iron that had once been magnetised is sufficient to induce feeble electric currents in a coil of wire, which current can be made to react on the iron and then again on the coil until the intensity of the current reaches a very high pitch. This did away with the necessity of using steel magnets, and led to the invention of the numerous kinds of dynamo machines which we now see. Generally speaking a dynamo machine consists of (a) the field magnets; (b) the revolving armature; (c) the collector; and (d) the brushes for leading off the current to the external circuit. The motive-power for driving the dynamo can be obtained from water, gas, or steam. In order to obviate the very practical difficulty of being obliged to use the electrical energy as soon as it is produced, and consequently being dependent for the light upon the regular running of the

machines, accumulators and storage batteries have been invented, and these form a reservoir of electrical power which can be resorted to whenever it is necessary. No electric light installation, public or private, should be considered complete without sufficient storage capacity to dispense with the engines for several hours.

Now as to the conversion of the electric current into light. The current is the result of the expenditure of energy, and consequently has potential energy in itself, or, in other words, it can be made to do mechanical work. When a current is traversing any conductor, it meets with a certain amount of resistance, in overcoming which heat is developed, and if the current be strong enough, the hot body becomes incandescent and gives off light. In the arc-lamps a powerful current is sent through two rods of carbon, which are in contact, and the ends burst into flame. By various mechanical and electrical contrivances the ends are drawn slightly asunder, and the voltaic arc is produced, and as the ends wear away the rods are continuously being brought close together again. In the incandescent lamps, on the other hand, a thin thread of carbon is inclosed in a vacuum, and the current passing through it heats it to incandescence. No oxidation takes place, and many of these lamps will last 2,000 hours.

The distribution of electricity for general purposes of illumination is a subject of such magnitude, and so complicated, that I prefer leaving it untouched rather than giving a hasty and incomplete sketch of it. It is the great question of the day, and very various opinions are held as to the best means to be adopted to overcome the recognised difficulties in the way of general distribution from central stations. The enumeration of these difficulties would take some time, and the discussion of them the whole evening.

To conclude, gentlemen, you may be certain of one thing, which is, that with electric lighting, just as with gas, oil, and other methods of illumination, there are good methods and bad ones, and it behoves you, in the interests of your clients and those for whom you act, to make yourselves acquainted with the improvements that are daily being made, so that you may not be at the mercy of the specialists whom you have to employ.

[Some notes of the discussion which ensued are held over, for want of space this week.]

#### MONUMENTAL FIGURE, AIRTH CHURCH, STIRLINGSHIRE.

THE figure given presents an interesting artistic development of a type of treatment lately illustrated in the *Builder* (Oct. 13, 1888), from Wittlesea Church, in Cambridgeshire, and from Castor Church, in Northants. An illustration from which this is drawn appeared in the first volume of the Proceedings of the Society of Antiquaries of Scotland, in connexion with notes on the Church of Airth, by Major Robert Bruce Armstrong, who there states that it lies in the eastern part of the building, and is a semi-effigy of a female, 6 ft. 3 in. long, by 1 ft. 10 in. broad; that it rests on a couch, the head on a cushion, the hands placed together on the breast, "a heavy covering folded back, falling in artistic folds on each side and over the end of couch, covering the figure from the waist downwards,



while on either side of the feet two hounds are represented. The headdress, beld back from the forehead by two spherical-headed pins, falls in folds on either side of the shoulders, the body being enveloped in a rather closely-fitting dress which leaves the whole neck bare." Major Armstrong believes it originally occupied a monumental recess in the Airth aisle, and conjectures that it represents Agnes de Erth, who married, prior to 1414, "Edward de Brus." She was alive as late as 1468. The learned and able society in whose reports it appears might well spare more space and illustration of the admirable monumental remains scattered here and there among the old churches of Scotland than has been done by them up to the present time.

J. T. IRVINE.

### Illustrations.

#### CHRIST CHURCH COLLEGE.

**T**HIS view of the street front of Christ Church College, Oxford, founded by Wolsey, and completed afterwards under the architectural direction of Wren, is reproduced from one of the pencil drawings made by Mr. John Fulleylove for the work in illustration of Oxford, a notice of which appeared (along with another illustration) in the *Builder* for Jan. 5 of this year.

As in the former case, the reproduction here given is on a larger scale, and more nearly represents the effect of the original drawing than the smaller reproductions in the work referred to.

#### ST. PANCRAZ WORKHOUSE.

WE illustrate this week the plans prepared by Mr. H. H. Bridgman, architect, for a rather extensive rebuilding of the St. Pancras Workhouse in King's-road, N.W.

When these buildings are erected there will only remain the rebuilding of the laundry block and chapel, all of which are included in the architect's scheme of remodelling the workhouse.

The plan indicates the old, the last erected, and the proposed new buildings. The blocks comprised in the tenders recently submitted,—and of which Messrs. Kirk & Randall's was the lowest, viz., 66,321l.,—are those marked AA, BB, C and D, E, F, G, and H, the corridors connecting the same, new system of drainage, division walls, and paving the surfaces.

The site of the workhouse proper is about four acres and a half in extent, and at present contains about 1,565 inmates, and the Cook's-terrace block adjoining 405 more, or a total of 2,070. The new plans provide for accommodation for 192 additional inmates,—giving a grand total of 2,262,—and will effect the reconstruction of the old buildings long since demanded by the requirements of the Local Government Board. Most of these old buildings were erected when the workhouse was first laid out in 1809.

At various times reconstruction has taken place, the more recent work being the women's and children's block, the kitchen and dining-halls, and the Cook's-terrace block, all by the same architect, the last of which was erected in 1885. Block K and the infirmary were erected about thirty years ago. The final work will be the removal of the present dilapidated laundry block, already referred to, a part of the space being utilised for a new laundry, &c., and the remainder, probably, for a chapel, as planned.

The workhouse ground has two different levels; the front angular portion slopes from the King's-road to the front of an existing block, covering a part of the ground where the main Block B, is to stand; the rear portion is much higher than King's-road, giving a difference of about 9 ft.

The old building being removed, the ground will be excavated back to and including the area in rear of the new main block, with a slight incline of about 3 ft. only from the new entrance in King's-road.

The first block, A, will contain the probation wards, two stories in height, for men and women respectively, each side being classified in sections, with waiting-rooms, baths, &c., as required, and warmed with hot water. The lodge and ambulance-room are in the front, immediately inside the principal entrance; a store-room for inmates' own clothes being provided under the entrance.

The main block, B B B, is 423 ft. long, and consists of three blocks connected on the base-

ment floor only. This floor is devoted to the stores and labour-test rooms, where the able-bodied men in the house can work at their different trades, and the women at mattress-making and sewing, the sheds in the air-wards behind being for wood-chopping. Lavatories, baths, water-closets, trade stores, &c., are also provided. The ground-floor of the centre portion, which is approached by a flight of wide steps, contains the offices, committee-rooms, master's quarters, and a central staircase. The double wards, right and left, are the dormitories and day-rooms for the same class of inmates, with staircase and lift, attendants' rooms, and a special ward between them.

The first-floor is for the matron and assistant medical officers' apartments, and a special ward. Communications with the side buildings is obtained on this and the upper floors by means of iron bridges.

The second-floor centre portion is for married couples, and the wards on this floor will also be used as dormitories for the aged and infirm.

The third-floor will be occupied by aged women in the centre, and by bedridden inmates in the side blocks.

The fourth-floor, in the centre, will be for the attendants' rooms, and the side wings for the bedridden inmates.

The lavatories and baths are in the annexes, and are supplied with hot and cold water.

The wards are supplied with hot-water warming apparatus, as well as with open stoves. Bay windows are introduced to all wards in front, to add to the cheerfulness of the same. The first-floor throughout is constructed of fire-proof materials.

Fire hydrants and hose are supplied to each landing, and stand-pipes and hydrants are fitted in the areas both in front and rear, all attached to the New River mains. The stairs, landings, and corridors throughout, are either in stone or concrete. There is a large cast-iron water tank high up in the tower, which can be supplied both by the New River Company's water main and from the workhouse well. The water is then conveyed to the several tanks or the annexes and other w.c.s., draw-offs, &c., by gravitation.

The construction of the floors of the wards generally is by means of two longitudinal double-wrought iron girders and cross-trees to the side walls, the whole resting on tiers of circular cast-iron columns. The ward floors are of wood, excepting the basement-floor, which is of wood-block flooring and asphalt respectively.

The two blocks C and C\* are for aged and infirm men, and are four stories in height, the ground-floor being used as day-rooms and the three upper floors as dormitories, with attendants' rooms, bath-rooms, stores, w.c.; annexes and bay-windows, water arrangements, fire hydrants, and other apparatus, are provided similar to the front main block. An additional external iron escape-staircase is constructed at the opposite end of each block.

The ends overlook the St. Giles and St. Pancras Burial Grounds, which are laid out as a public garden, and are together about 7 acres in extent; the bay-windows, therefore, will enable the inmates to see the gardens from any part of the wards.

Between the two last-named blocks is the male imbecile block, C, two stories in height, with day-room and dormitory on each floor, with the necessary attendants' rooms, stores, baths, lavatories, and padded-room.

The water, warming, and fire-supply arrangements are as before described.

The male infectious block E, is situated in the eastern corner, as isolated as the site will permit of, and is two stories in height. It has two entrances, to admit of sub-division, and is fitted and finished in a similar way to the last block.

Block F is for female imbecile wards, and is three stories in height for subdivision, with the necessary attendants' rooms and accessories as before described, and is finished and fitted in the same way as the male imbecile block.

Block G contains the female infectious wards, two stories in height, and similar in construction and appointments to the male infectious block.

Block H comprises the stable and coach-house, and is planned for four horses, two carriages, and two hearses, with harness-room and corn-store at either end of the stable and corn-loft over. A lodge is also placed at the back entrance, with a weighing-machine in the roadway. Coals, flour, butcher's meat, and other

heavy stores enter by this gate. Adjoining this gate is placed the severer labour test cells, a stone-breaking by the rougher able-bodied class, also a carpenter's workshop, and a timber shed and coffin-store.

Most of the walls internally are finished, stucco for painting or colouring; some portions are finished with digging on the brickwork, a then simply coloured. The covered ways, opening at the sides, connect the whole of the buildings, and cross-ways communicate with them from the dining-halls and kitchen, at three bridges span the back area of the main block, connecting them to the main building.

The covered ways, areas, and ground surface of the airing-grounds are finished with Hobnail tar-paving, laid to a good fall.

Two main lines of pipe drainage, laid parallel with the covered ways, take the drainage of several blocks and ground-surfaces, these form a third line of twelve pipes behind the first main block, and a fourth in front of 9 ft., taking the several down-pipes, the whole being intercepted by a 15-in. pipe-drain passing under the main block; and, after connexion with the drainage from the stables and probation block discharges into the main sewer in King's-road with a good and regular fall the whole distance.

The workhouse, which provides for a parish with a population of considerably over a quarter of a million, is admirably situated, being surrounded on three sides with streets, and with considerable open space beyond, and on the fourth side by the gardens referred to. The Vestry-hall of the parish stands on the south-west corner of the site, separating the workhouse from the cooks' terrace block. There some talk of the Vestry-hall being removed, and rebuilt on a more commodious site elsewhere.

The laundry block would be four stories in height; in the basement there would be five steam boilers. The basement of the chapel would form the engine-house and stokers, for which latter the boilers would be worked. There would be a skylight immediately over the fronts of the boilers, and an area on either side for light and air. On the ground-floor this laundry, on either side of the central chimney-shaft and staircase surrounding it, would be the receiving-room and delivery room respectively for the soiled and cleaned linen.

The linen would ascend and descend to several floors by means of lifts. On the top floor of the building would be the washhouse with a louvre roof for the emission of steam. The soiled linen would be first sent to the floor from the receiving-room, which would be fitted with the necessary washing and wringing machinery and appliances. It would then descend to the drying-rooms on the next floor, the hot chambers of which would be heated by gas; a part of this floor, however, would be open to the air. The next floor down would be the hanging, ironing, and sorting-rooms, and the linen would then pass to the delivery-room on the ground-floor for distribution. The machinery would all be worked by steam power.

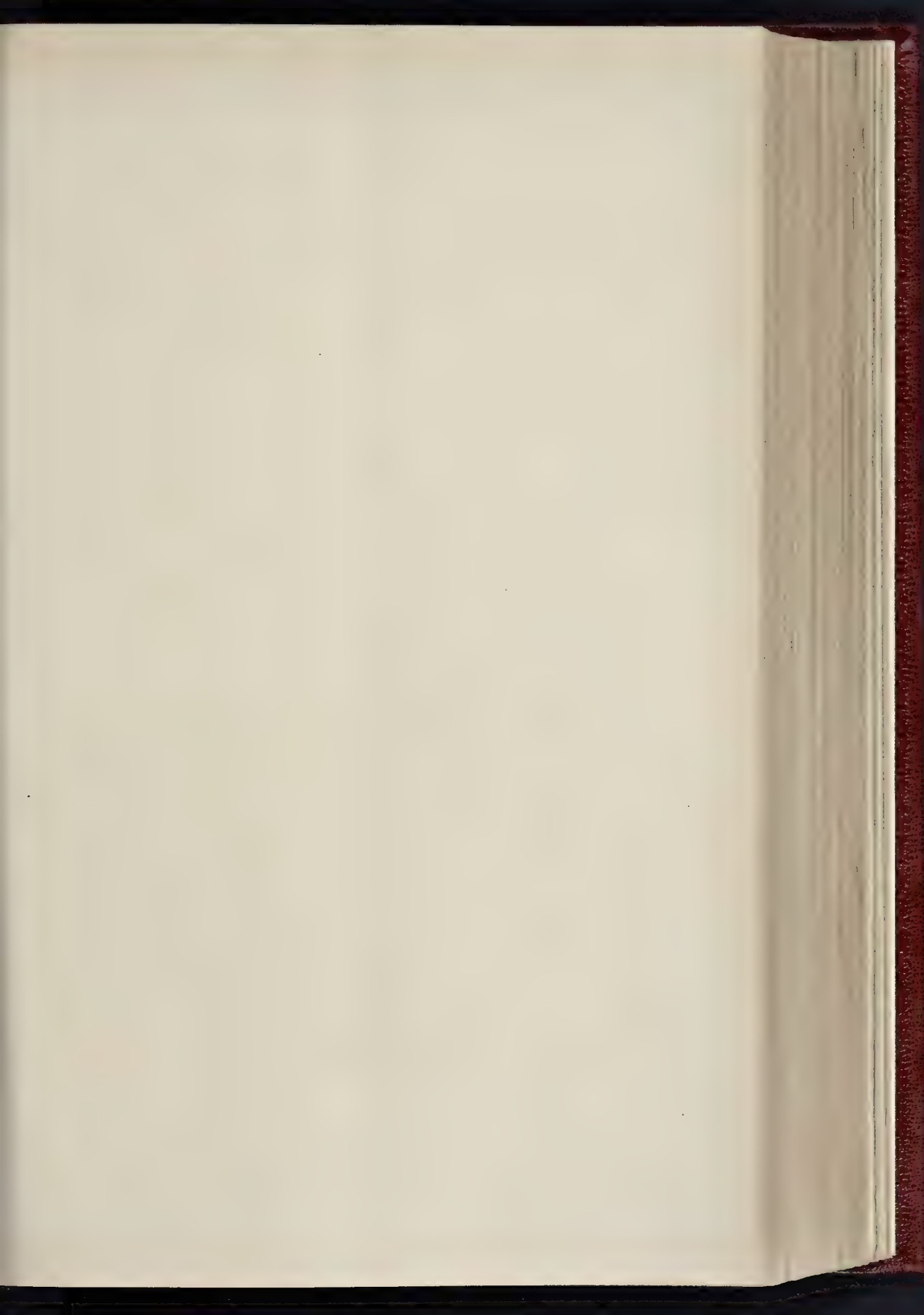
The chapel, which would accommodate about 600, would be raised some few steps higher than the general level, for additional height and air, and light to the engine and pump room beneath, in which also the entrance to the work would be located which supplies the water.

#### DESIGN FOR A LIBRARY.

WE give the perspective view and detail elevations, and plans of two floors to a small scale, of the design by Mr. Arthur Sykes, which the Council of the Institute of Architects have awarded the Soane Medallion this year.

**The Architectural Association.**—The eighth ordinary meeting of this Association is the present session took place on the 1st inst. Mr. Herbert D. Appleton (President) in the chair. The following new members were elected, viz., Messrs. W. E. Pearman, W. J. Keith, A. M. Spencer, and H. E. Farmer. Mr. T. E. Pryce (Hon. Sec.) drew attention to the competition for the Painters' Company's prize for which only two members of the Association might compete. The Chairman announced that the Birmingham Association had not yet passed their modified rules. He hoped, however, the matter of the affiliation would be brought forward at the next meeting. Mr. John Slater, B.A., next read a paper on "Artificial Illumination," which was illustrated by apparatus and experiments. We give the paper on another page.







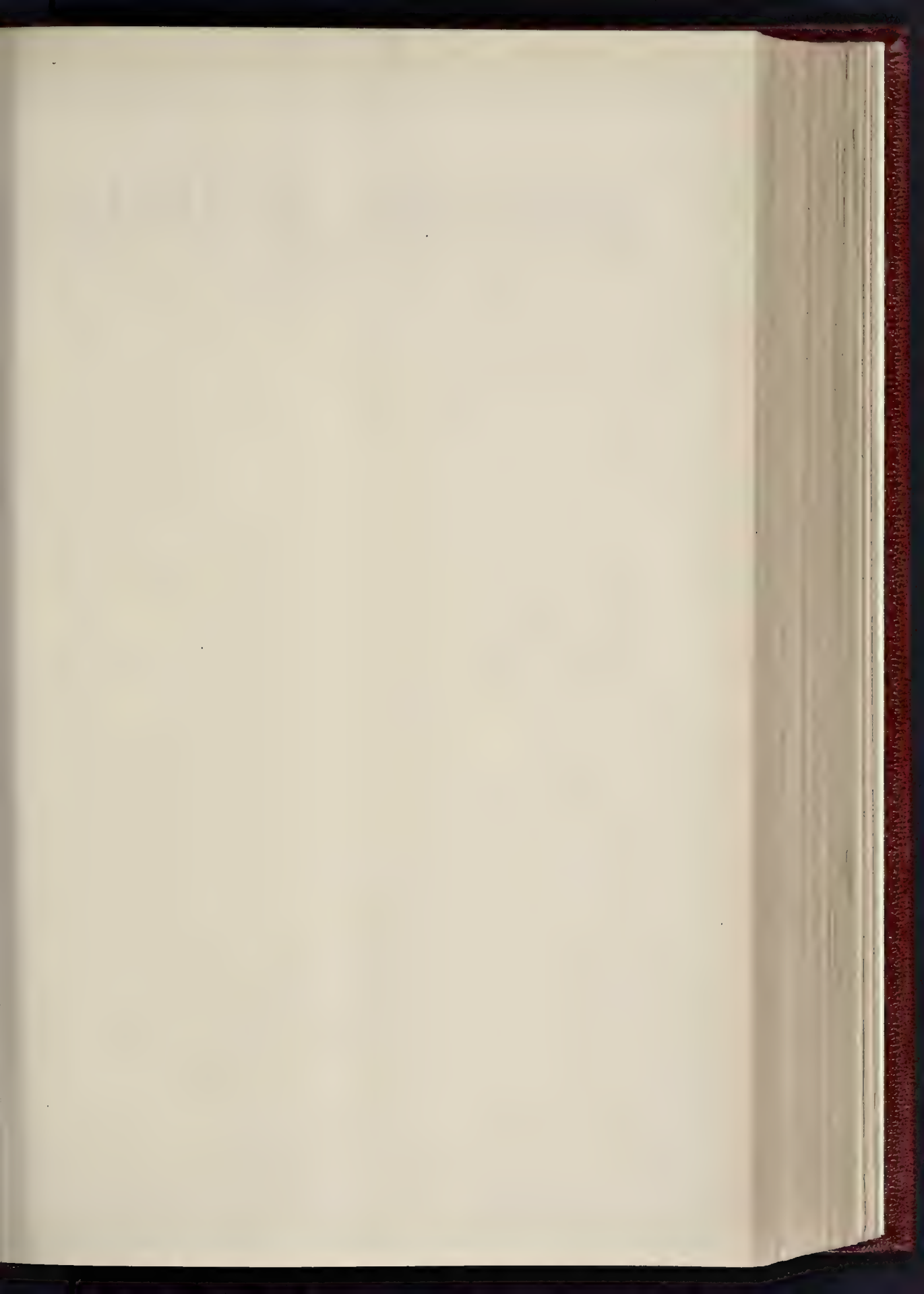
CHRIST CHURCH COLLEGE, OXFORD



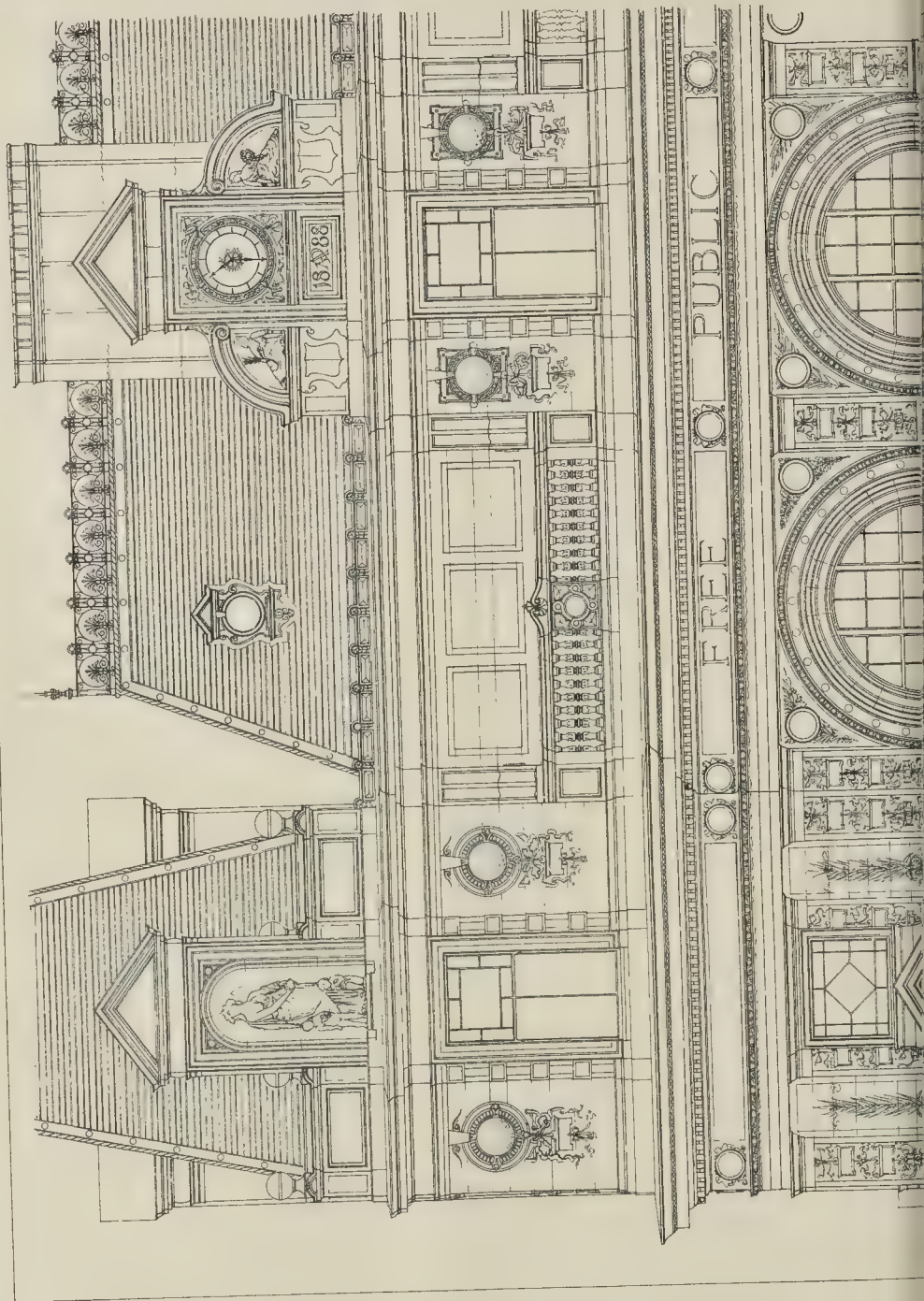




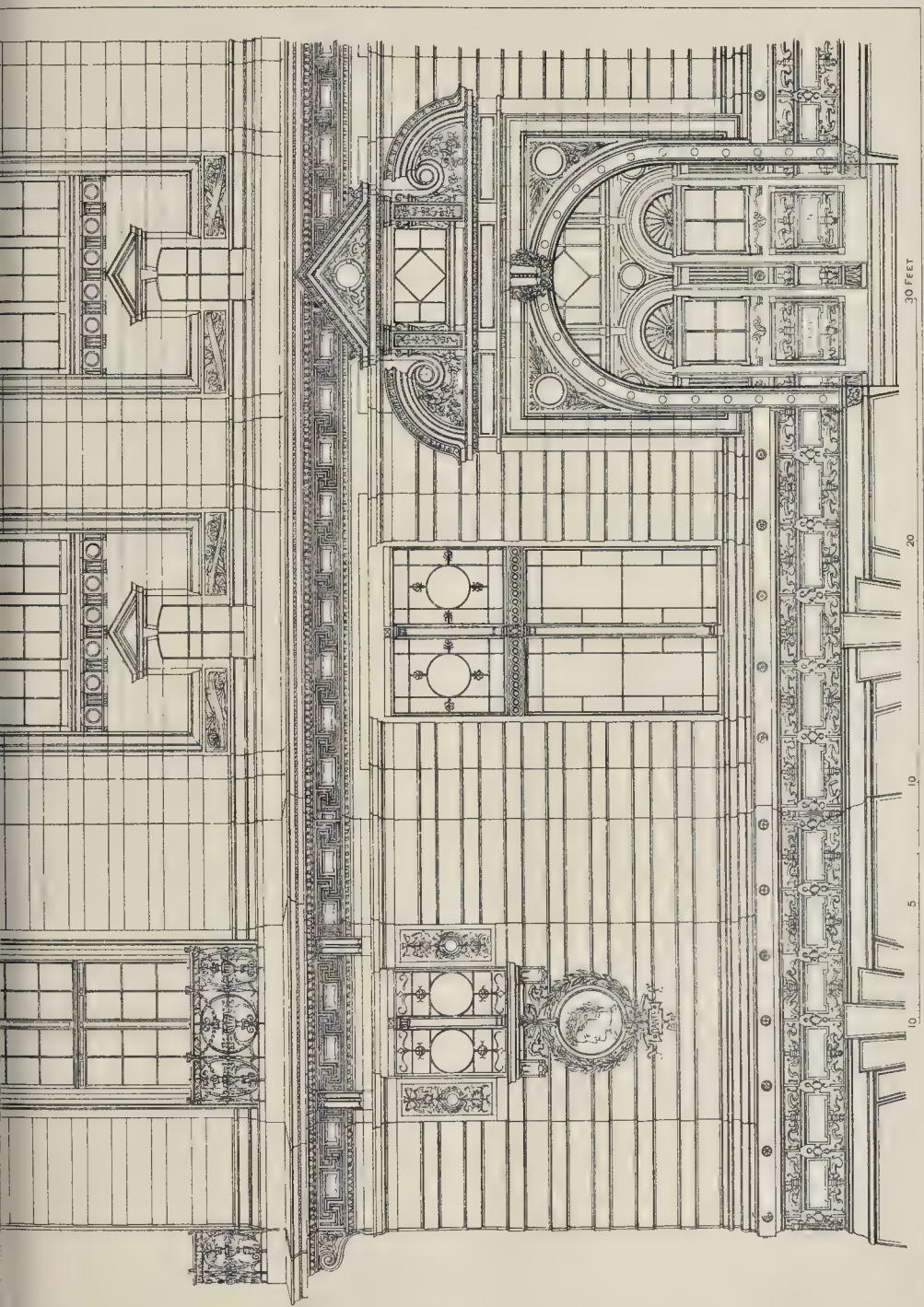




THE BUILDER, FEBRUARY 9, 1889.







DESIGN FOR A PUBLIC LIBRARY. BY MR. ARTHUR SYKES, A.R.I.B.A.  
DETAIL ELEVATION.





CHAPTERS FROM THE HISTORY OF  
CARPENTRY AND JOINERY:

## LECTURE AT CARPENTERS' HALL.

ON Wednesday evening last the first of the present series of free lectures at Carpenters' Hall on subjects connected with building was delivered by Professor T. Roger Smith, in the lecture announced by Mr. Banister Fletcher, who was unable to attend, having met with an accident.\*

Professor Roger Smith said:—The history of carpentry and joinery is one of the subjects on which questions are set in the technical examination which this Company holds annually, and, though a general historical account of carpentry and joinery in all ages and countries could no more be compressed into one lecture than the whole history of England, we may usefully examine together a few or two detached chapters, as I have called them, confining ourselves chiefly to matters which can be illustrated by actual specimens accessible in or near London. It seems desirable, as we must make a selection, to direct your attention to examples where the worker of wood appears as an artist in preference to those where he is only a constructor, and where an example which has to be referred to makes a special appeal to our notice. I will endeavour to point out briefly what it is in the work that entitles it to rank as a work of art. Carpenters' and joiners' work, looked at as artistic, will demand our special attention in this Hall during the coming years, owing to the prizes which the liberality of Mr. Harben has placed under our disposal, and this circumstance has led me to take the line I have adopted.

When we try to satisfy our natural curiosity as to the works in wood executed by the great nations of antiquity who were famous builders, the fact that wood is perishable, and that fire decay has swept all actual remains away, seems to shut the door in our faces; and yet we all will be able to find unmistakable indications of what was done by the carpenter in several historic nations, if we look for them. Before we do this, however, let me say a word about early ancient and primitive peoples, and the use of wood made of timber in building.

The first thing noticeable with regard to primitive folk is that men must be civilised enough to possess tools before they can make much use of timber. It is more possible for the savage or uncivilised men to build themselves huts with stones and with earth than with timber, and the desirability of being able to work timber for various purposes has probably had a good deal to do with driving such people at an early stage to contrive axes and knives.

Savages unacquainted with the use of iron tools, however, able, by the help of fire, and of bone and bone implements, to get down trees and make canoes. But probably the most ancient timber buildings,—those curious structures known as lake-dwellings,—were the work of persons further advanced than this. Lake-dwellings are found,—or rather remains and pieces of them are found,—in various parts of the world, at the shallow margin of lakes, and in nations where it is fair to presume that the necessity for shaping timber into canoes or rafts had occasioned the people to acquire some dexterity in the felling and shaping of trees.

Lake-dwellings were built out right into the water, and are still in use in some countries. In the shores of many lakes,—in Switzerland, for example,—remains have been found of piles of strong stakes of timber driven in rows into the ground, and so disposed that it is clear they had supported dwellings in which the ancient peoples had established themselves on the lake, comparatively safe from marauders and wild beasts. Vast heaps of refuse which I accumulated round these ancient sites have shown in some cases laid bare, where from circumstances the level of the lakes has fallen, and these mounds disclose many curious traces of the mode of life pursued by the ancient lake-dwellers. Probably these are the most ancient specimens of carpentry that survive in the world.

Those nations which advanced in civilisation still employed timber would naturally come to make their timber buildings more and more

highly finished as they improved. There can be no doubt that this was the case in many countries, though the buildings have long since perished; and when I use the words, there can be doubt I am not merely speaking in a speculative way about something that is very likely to have happened. I am dealing with things capable of proof, and the proof (which you will be the better able to enter into the more you know about carpentry) is this:—*They afterwards imitated their timber buildings in stone, and the stone copies of originals which have perished have some of them come down to us.*

The information which we gather in this way is not unlike that which the geologist can gather about some plants and animals,—such, for example, as many of those to be found in the coal. These plants have entirely decayed away and disappeared; but they have left an impression on the material which surrounded them, and we can see on the surface of the hard coal every frond of a fern perfectly imitated. Let us consider an example of somewhat the same nature where timber construction is imitated in stone in an anciently-settled European country.

If you will visit the British Museum, and, crossing the great Hall as if you were going to the reading-room, examine the large tomb from Lycia which you will find there, you will soon convince yourselves that this structure of stone is faithfully,—I might say slavishly,—imitated from a timber original. Let me try to point out the peculiarities which prove this.

The structure as we see it is not all ancient, as it will be seen that portions which were deficient have been supplied in stone of a different colour; but as far as the forms go, the new are faithfully copied from the old, and the shape is just that which this tomb had when it was erected new. Upon a rectangular base, which probably was of stone in the timber original, there comes a course of stone enriched with sculpture in relief, and upon this there appears, cut out in solid stone, what looks vastly like two plates of squared timber at the sides, with two corresponding plates at the end. The end-plates appear to be notched on to the side-plates, and the ends of the latter appear as though they projected slightly, while the ends of the former (the front and back plates) are longer,—are rounded,—and what is most remarkable, are notched. Above this comes a superstructure, the sides of which exhibit a series of projections half way up, and again at the top, resembling exactly the ends of timbers laid across at two levels, so as to form an intermediate support, permitting two coffins to lie one above the other in the interior of the timber original, forming a kind of ceiling above the top coffin. The end is divided into two by a kind of square pilaster, without cap or base, exactly like a wooden mullion, and in each half is a sinking exactly like a panel in a door.

The upper part has an arched outline, and there are imitation ribs, like those of a boat, and imitation timbers lying purlin-wise upon them, and overhanging; while the arched gable is again filled in with an imitation of panelling. Above the purlin-like timbers there are what are exactly like two thicknesses of boarding, and there is a heavy ridge to the roof, something like the keel of a boat.

No one of my audience who knows anything about masonry can for a moment feel that any one of the forms above the sculpture bears the least resemblance to anything that it would be natural to build in stone. No one with the least familiarity with carpentry, joinery, and boat-building can hesitate for a moment to recognise in every line the forms into which it is perfectly natural for the worker in wood to shape his material. Here, then, we have a timber structure imitated in stone. It is supposed to date about 600 years before the Christian era,—that is to say, about 2,400 years ago,—and, when you have examined it, you can say with certainty that at the time when it was originally put up the Lycians were accustomed to construct such tombs of timber, to square the beams, to halve them together much as carpenters do now, to enclose their tombs with panelled doors, and to roof them in a manner which reminds us that they occupying a position on the shores of the Mediterranean Sea, were boat-builders as well as carpenters.

In Lycia, the country from which this specimen comes, a very considerable number of monuments remain, some of them cut in the face of the rock, and the greater part of them as similar to woodwork as the one I have described. In addition to these we, however, also find a certain number of monuments in

which the forms proper to woodwork are abandoned, and forms only appropriate to masonry are used. These, without doubt, are of later date, and show us the transition from timber to stone completed.

From evidence of the same sort as that which I have put before you,—that is to say, from existing remains executed in stone, but imitating wood-work,—we are able to say that timber buildings were used by the Egyptians, the Assyrians, the Greeks, and other nations of antiquity, and we also know that timber roofs and floors were made use of by the ancients much in the same way in which we use them now.

I shall not attempt to detain you while I examine all the traces that occur in the finished work of the mason of the earlier use of carpentry in these countries. The most interesting topic which I should have to enlarge upon were I to do this would be the familiar forms of the Doric Order, as used by the Greeks. The triglyph is generally believed, and is expressly said by Vitruvius,—a Roman architect, who wrote a treatise on architecture,—to represent the end of a timber beam resting on another timber beam (the architrave), which the column carries, and most of the parts of the cornice look as if a timber original had given rise to them. The resemblance is not so undoubted as in the case of the Lycian tomb, but it is very marked, and, to my mind, there is no reasonable possibility of its not being recognised when pointed out.

Before leaving the nations of remote antiquity, I should like to direct your attention to a fragment of cabinet-maker's work which has lately been placed in the British Museum, and which may perhaps claim to be the oldest piece of such work now remaining. I allude to the chair of Queen Hatasof, which formed one of the most remarkable objects in the great Manchester Exhibition two years back.

The Romans (who possessed the talent for construction in perfection) made use of both carpentry and joinery; but there are really fewer indications of how they carried out this work than in the case with the older nations to which I have alluded, for, of course, the actual specimens of work have perished, while no such imitations as have been found in Lycia, Egypt, and other countries were employed. Roman engineering and construction was founded upon the comparatively mature work of other and older nations. We know, however, that the Romans, in the early days of Rome, built timber bridges, for the first bridge over the River Tiber was of timber. The earlier theatres and amphitheatres were also made of wood, and it was considered an innovation, and looked upon with distrust, when the first theatre of a permanent character made of stone was erected in Rome. It is stated that the first amphitheatre was formed by erecting two theatres, each a semicircle, and set each on a pivot, so that the two could be placed back to back and used separately, or could be turned round face to face and used as an amphitheatre. It is obvious that if this was really done there must have been a great deal of constructive skill in the Roman carpenters, as it would not be an easy thing to form such a twin structure as this so that it would move at all, or so that when it was moved it should come together satisfactorily.

Both the Greeks and the Romans framed the roofs of their temples and other buildings in timber. They had gables or pediments and sloping roofs covered with tiles, the pitch of the roofs being the same as that of the pediments.

Joinery was but little employed in Roman buildings. They had in many cases curtains where we employ doors and windows. They had, as a rule, floors and skirtings of plaster or mosaic rather than, as is common with us, of wood, and they employed both bronze and marble for parts of their furniture. There is, however, visible at the British Museum a curious witness to the fact that the Romans sometimes used panelled doors like ours, in the shape of a door brought from the ruins of a Syrian town of Roman origin (now deserted), where stone was plentiful and wood scarce. This door is in stone, hinges and all, but resembles very closely in appearance a clumsy, square-panelled English door.

This closes what I may call my first chapter concerning ancient woodwork. The second, which can only be very fragmentary in its nature, has to do with woodwork in the East.

In Arabia, Persia, India, China, and Japan, we have vast nations all more or less highly civilised and given to building, and all con-

\*We regret to learn that whilst Mr. Fletcher was riding the 30th ult., his horse fell on him, dislocating his shoulder and injuring his ankle. He is at present confined to his house, but we are glad to hear that he is progressing favourably, and expects to be able to attend at his office Monday next.



nected together by such broad resemblances that we may speak of them, notwithstanding the differences of race and habit, in a general and comprehensive way as Orientals. Nearly all the important places of these countries enjoy a warmer climate than that of Europe, and this favours timber construction in more ways than one. The requirements of the people are sufficiently supplied by a comparatively slight structure. The absence of frost gives more prospect of such a structure proving durable. The climate encourages the growth of fine forest trees, of which the teak may be taken as a type. Accordingly, in most Oriental nations, timber architecture has been much used, and in one, at least, of them,—namely, Japan,—the liability to earthquakes has been a serious obstacle to the adoption of more permanent building materials. I am not, however, about to ask you to consider Oriental woodwork in much detail. It would require a lecturer more thoroughly at home in the subject than I can claim to be, a vast profusion of illustrations, and an evening to itself, to give you even an outline of such a subject. I can only pretend to put before you some detached facts of interest.

In India a great deal of beautiful woodwork has been executed, and is being done at the present day; and there the stone architecture, especially the Hindoo work, as distinguished from the Mohammedan, almost invariably betrays marks of the influence of timber forms, and in some cases is as completely a copy of them as the old Lycian tombs. Brackets and corbels, slender columns and projecting eaves, are constantly in use in stone buildings, the shapes of which, even when they are cut in stone, suggest timber as their original and proper material.

Fergusson, the best authority on the subject of Indian architecture, considered that in many parts of the country the timber originals existed, and so to speak, set the fashion, very many centuries ago. In other districts temples and important buildings are still being built of timber; and in many parts of the country the fine timber obtainable is used for parts of domestic dwellings, and (as with us) for shop-fronts. Fortunately there exists within a few miles of this spot a collection of actual specimens of Indian domestic architecture, which will give you some little idea of what the leading forms are, and of the method of construction and ornamentation, and will illustrate to some extent this curious imitation of woodwork in stone which meets us at so many points, but nowhere more strikingly than in India.

As an example of Indian woodwork executed at a date before European influence had been at work on the taste of Indian artists, I wish to invite your attention to the architectural façade of a pair of street dwelling-houses built in Ahmedabad in the seventeenth century,—say, probably 250 years ago. The actual front of this block of buildings has been acquired for the South Kensington Museum, and brought to this country and rebuilt here, and is to be seen in the Indian department of the South Kensington collection, where I venture to hope some, at least, of my hearers will pay it a visit. These were a pair of comparatively small street houses, three stories high—i.e., ground, first, and second floor,—and with a double verandah, or, in other words, two balconies, one above the other, running the entire length of both houses, at the level of the two upper floors; and the main architectural features are connected with these balconies, and are entirely in woodwork. The houses stand, as is very usual in the streets of Indian towns, on a kind of low basement or step set of plastered masonry, about 2 ft. high and 2 ft. projection. The main wall of the building consists of two thicknesses of timber-framing of squared timber, about 2 ft. apart, with no attempt at ornament, and no part of it overhanging. The spaces are now filled with wood, but this represents, I believe, plastering on a kind of brick-nogging. The verandah at the level of the first floor is carried by six large brackets, and posts run up, one from each of these brackets, to the upper balcony, and other posts from that to the roof. The front is thus divided into five spaces or bays. These are unequal, three being narrow and two wide, symmetrically arrayed thus—narrow, wide, narrow, wide, narrow. Opposite each wide space there is a doorway in the wall behind on each floor, and opposite each narrow space a window. The brackets which support the lower balcony consist of a projecting timber built or pinned into the wall with a long raking

strut to support the end of it. On this bracket rests a short block, and on that the plate carrying the front of the verandah. The floor of the verandah itself is carried by small joists, the ends of which show over the plate, and the soffits of which are also seen; and the balcony front, divided into large panels, is framed of stout timbers. The sturdy posts carrying the upper verandah, and the slighter ones going up to the roof, are polygonal, worked into a square at the top. They rise inside the verandah front, and are surmounted by brackets of different design from the heavy ones below, and of a general form very frequent in Indian buildings. The upper balcony front resembles the lower one, and the boldly-projecting roof above overshadows it and is carried on a system of timber brackets and plates resting on the posts already described, and is covered with tiles. The fronts of both balconies are not quite vertical, but lean a little outward.

Almost the whole of this woodwork is profusely covered with carving, in the best possible taste. The various brackets are boldly carved in very high relief. The panels of the balcony fronts, which are the most conspicuous surfaces, are filled with very delicate carving of leaves and flowers in various patterns; and the ends of the balcony joists, the various plates, the upper portions of the posts, and, in short, nearly every part of the woodwork, is also carved in low relief. Finally, all this carving has been painted in a very artistic and unobtrusive way, and a harmonious kind of rich golden tone is the result.

The carpentry is sensible, but roughly done, as far as one can examine it. The secret of the very great success of the work is, first, the appropriate design of the whole, and, secondly, the beauty of the carving and the colouring. Nothing can be more appropriate to the wants of a locality where they desire to overshadow the walls in the hot part of the day, and to be able to enjoy the breeze in the cool part, than this great verandah formed of two balconies; and with such a leading idea it would be hard to suggest anything more thoroughly successful and charming than this work of an unknown Indian artist, who died two centuries ago.

It is instructive to turn from the timber front I have described to a reproduction of the stone front of an Indian house which stands by its side. In that you see a verandah which, though executed in stone, is formed in imitation of timber. Slender shafts, overhanging roof, and corbels are among its most striking features. There are several other specimens of Indian woodwork in the same collection well worth examining for their carving, if not for their carpentry. There is one old example of a very elaborate timber balcony brought from Lahore, and dating from the last century, to which I would especially direct attention, on account of the intricacy and beauty of the panels of pierced lattice-work with which much of the front is enclosed.

I believe you may take it that work much like these specimens was done in India at a much earlier date than that assigned to these Ahmedabad houses, and is still being done, but with the important difference that intercourse, first with the Portuguese and then with ourselves, has in many places modified the taste of the native artists and artificers, and has done them no good.

Before we pass on, it is worth while to notice some of the peculiarities of these Ahmedabad house-fronts, looked at as works of art. Nothing, in the first place, can be more appropriate. I have had the great good fortune to see India for a brief period, and I have felt what an Indian sun is like, and nothing seems so suitable as to surround the walls of your buildings with some sort of separate structure like these balconies, and to make the roofs overhang boldly, so that as much shadow as possible may be gained, and I am quite sure there is nothing that is more thoroughly essential to the artistic success of any constructed work than that it should seem fit,—fit for its purpose; fitly treated having regard to its materials, situation, the climate of the spot, and so forth; and fitly ornamented. If anything you build strikes the observer as unfit, you can never claim for it that it is a work of art. Another point is the blending of symmetry and variety in the spacing. Had all the bays been alike, the composition would have been comparatively tame and have lost part of its charm. Had they not been symmetrically handled, it would have looked irregular. Again, in looking it over from below to above, there is just that mixture of repeti-

tion and variety which is most conducive to grace. The great framed brackets, the stout posts of the lower balcony, the slender ones of the upper, keep up one line of support, but introduce variety, and the variety is still more interesting if you compare narrowly the things that are very nearly alike but not quite, such as one of the more sturdy posts below with one of the slenderer ones above, or one set of carved panels with another. The skill with which ornament is employed is quite as striking as the beauty of that ornament. This structure is first constructed and then decorated. You see all the timbers of the structure, and, though they are profusely carved, nothing interferes for a moment with the complete and clear display of the timber structure, which, with the exception of a little that is hidden by the balconies, the spectator takes in the whole at a glance. Then upon the parts which are not framing,—such as the panels, which are the proper field for decorative treatment, the artist has lavished his utmost resources, and the carving,—appropriate, varied, and harmoniously coloured,—is as rich as it well could be. These are some of the lessons which this bit of Indian work teaches us when we try to find out what it is that makes it pleasing, and they are lessons for us all. I should like to add in conclusion, that several typical forms,—as it is usual to term those models which recur again and again under different modes of treatment, and yet, in spite of their difference, have a strong family likeness,—several typical forms I say, are to be found in the corbels and in the polygonal posts of this interesting structure.

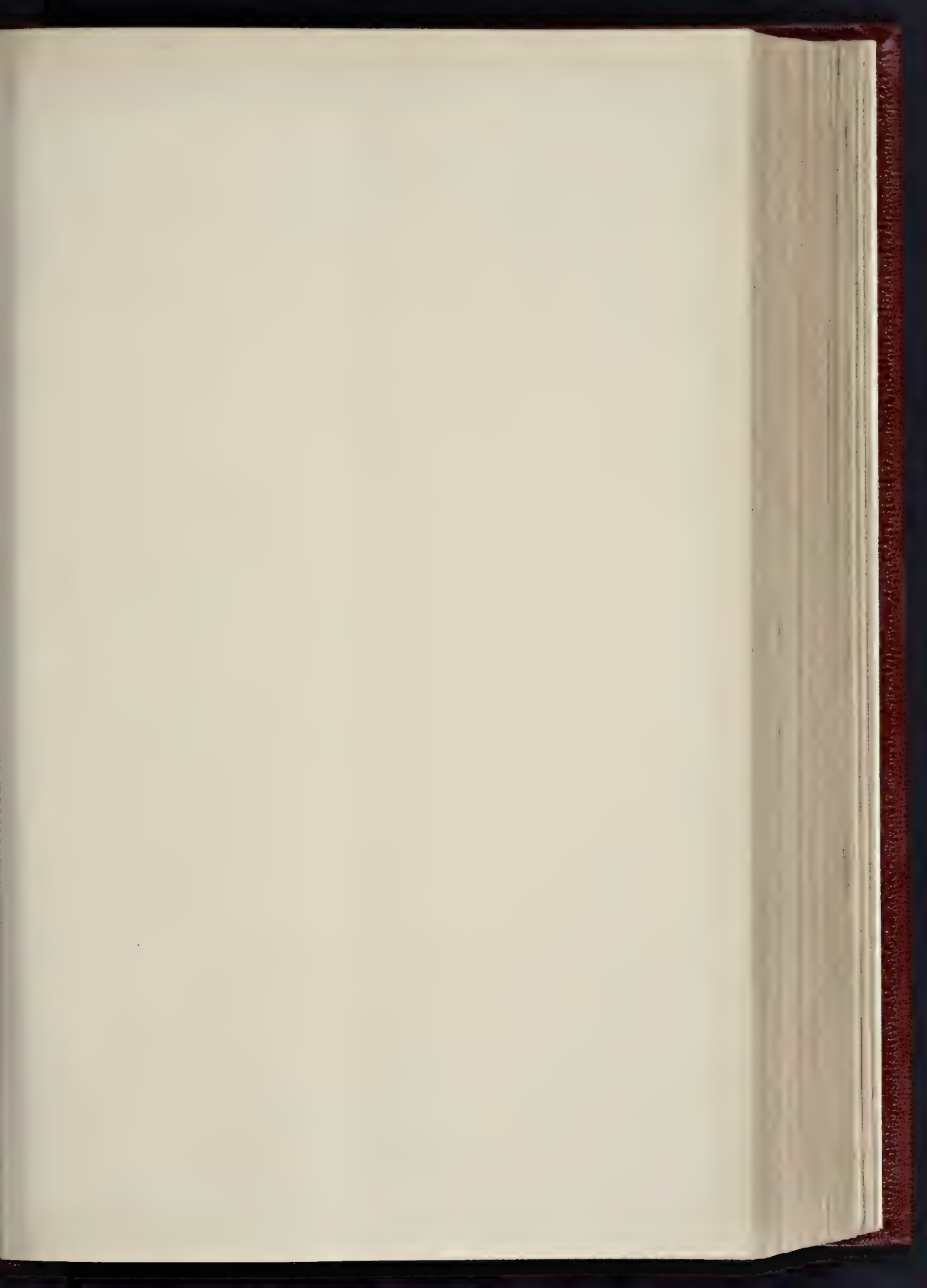
While the reference to the South Kensington collection is fresh in your minds, I ought not to omit a mention of the specimens of Arabian work, of which several will be found close to the side entrance to the Museum, near the Science Schools. Here we have several balconies resembling the Indian work in baying fronts plainly, if not rudely, framed together in wood-work, but with the peculiarity that the panels are filled by grilles or lattices formed of small pieces of wood turned and moulded, no bigger than large cotton reels, and fixed together so as to form out of the most simple materials, the most rich and pleasing designs. Most of the work in Arab architecture is done in materials not at present under our notice, but these balconies are too characteristic and too good to be passed over.

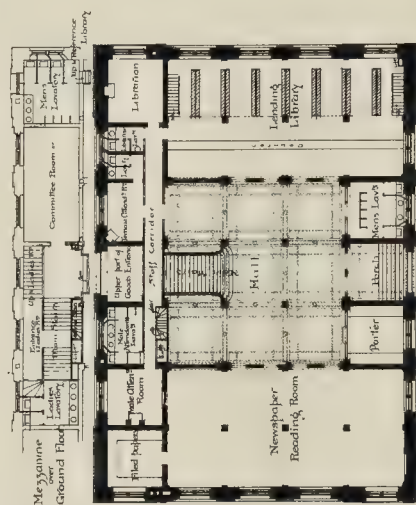
In China, carpenter's work is employed both in private houses and in some larger structures, and pagodas. The roofs of these have a tolerably sharp pitch, with boldly overhanging eaves very much tilted up, and the angle so formed passed off to a curve, which makes a characteristic outline. The hips of these roofs are made very prominent and ornamented.

"Another peculiarity," says Fergusson, "is their mode of framing a roof, so unlike that of any other people. This arises from the timber most easily available for the purpose being a small pine, which has the peculiarity of being soft and spongy inside, while the outer rims of wood just under the bark retain the hardness and strength. It is thus practically hollow wooden cylinder, which, if squared to form a framing as we do, would fall to pieces but, merely cleaned and used whole, it is a very strong and durable building-material, though one which requires all a Chinaman's ingenuity and neatness to frame together with sufficient rigidity for the purposes of a roof. The uprights which support these roofs are generally formed of the same wood, though not unfrequently they are granite posts,—they cannot be called pillars,—of the same dimensions and strengthened, or rather steadied, by transverse pieces of wood, the space between which and the roof is generally filled with open-work carving, so as to form a species of frieze. The roof is usually constructed by using three or four transverse pieces or tie-beams or above the other, the ends of each beam being supported on that below it by means of a framed piece of a different class of wood. In this method, though it may look unsatisfactory, they make up a framing that resists the strongest winds unimpaired."

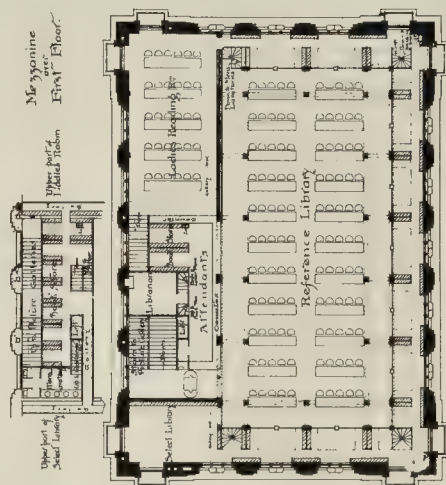
Japan, as has already been hinted, affords a remarkable example of the almost universal employment of timber for buildings. A complete account of this system of construction may be found in the papers by Professor Josiah Conder, read before the Royal Institution of British Architects, and, seeing the impossibility of giving a sufficient account in this lecture



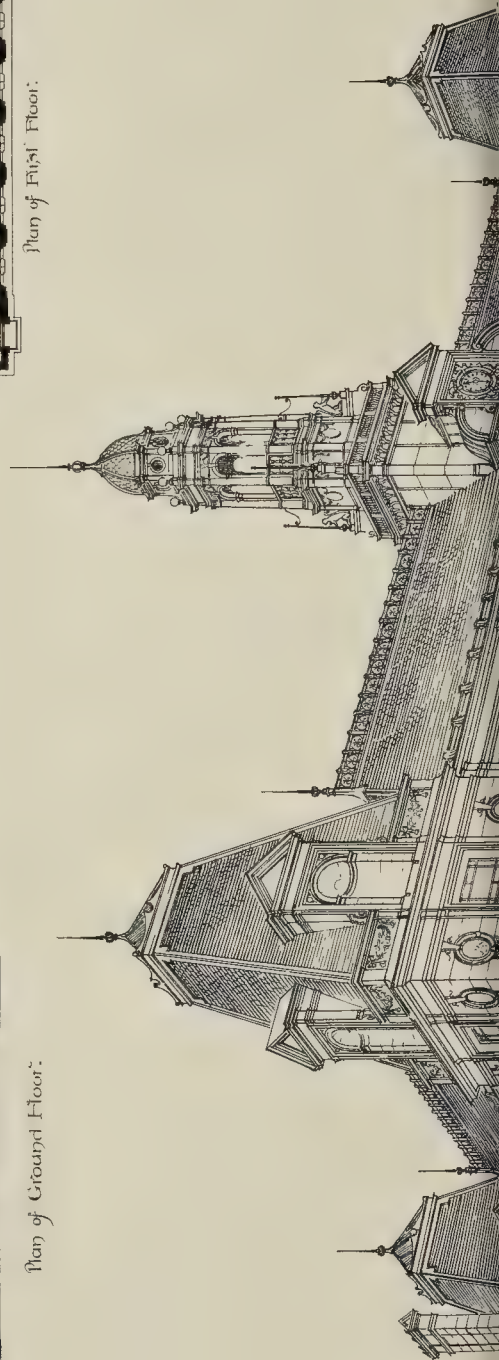




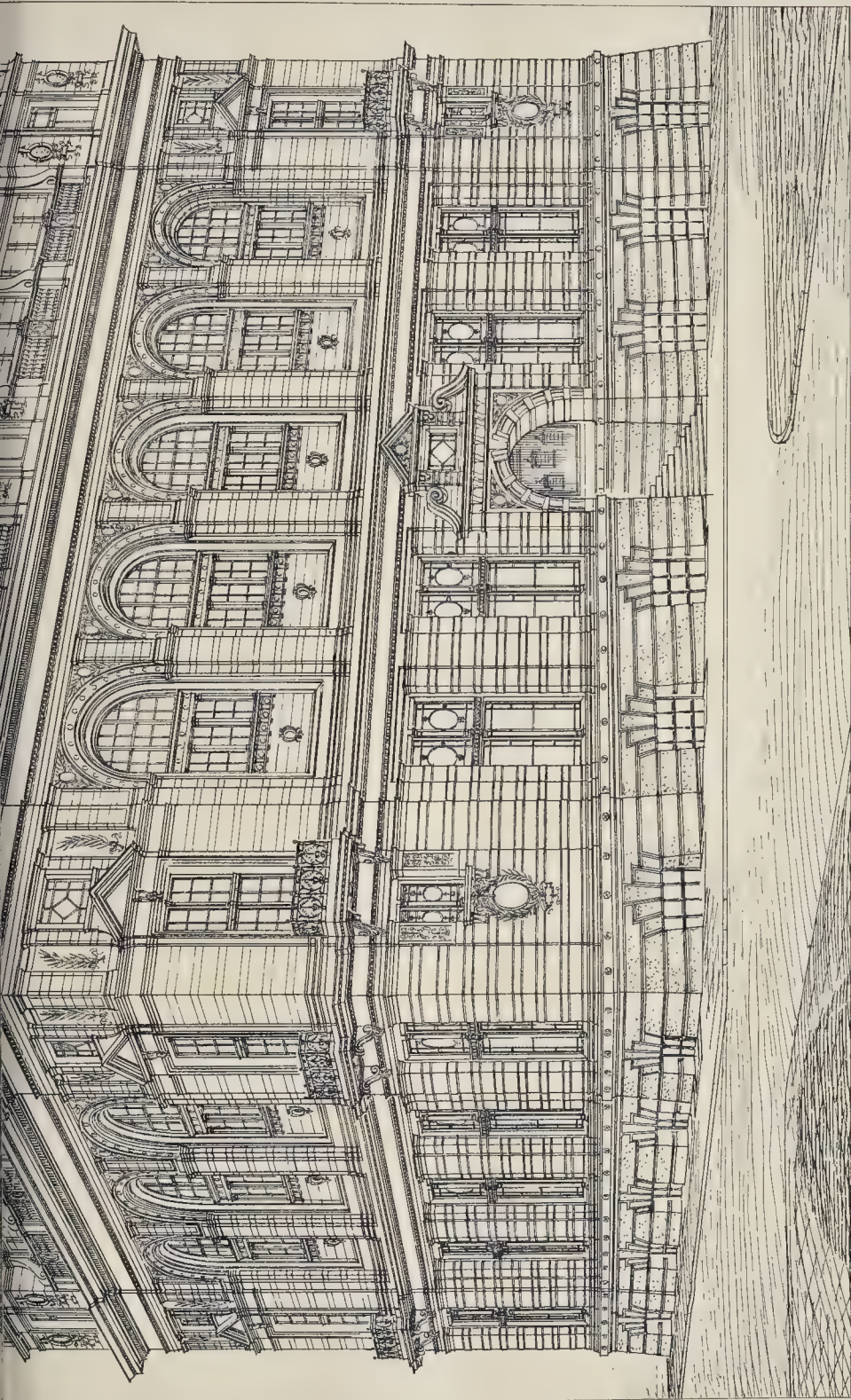
Plan of Ground Floor:



Plan of First Floor:







DESIGN FOR A PUBLIC LIBRARY—By MR. ARTHUR SYKES, A.R.B.A.,  
PERSPECTIVE VIEW AND PLANS.

*Awarded the Soane Medallion, R.I.B.A., 1889.*





not do better than refer those who are anxious to investigate Japanese timber-buildings to those exhaustive papers.\*

#### FAIRFORD CHURCH WINDOWS.

SIR,—My attention has been called to a paragraph in the *Builder* of January 26, commenting on my letter which appeared in the *Times* of January 19. I should like to have the opportunity of re-assuring any lovers of ancient art who may be with some misgiving of the "restoration" of Fairford Windows, that no such work is contemplated. Where portions of a light or piece of glass are upside down, or otherwise obviously out of place, they will be put back in their original positions. The Prophets in the windows of the chancel aisle will also, I hope, be placed in their original order, so as to correspond with the series of Apostles on the opposite side of the church. The windows were removed from the church in the nineteenth century to save them from the hands of moderns, and when they were replaced, the order in the Prophets was changed, as Mr. Joyce has intimated in his splendid monograph. Except in the particulars here given, it is not proposed to make any alteration in the windows as they now stand. Where pieces are unfortunately missing, no attempt will be made to replace them; I think the public may safely trust Mr. Westlake to insert in the vacant places glass of such a design as to disfigure the windows as little as possible. The lines of the old (in many lights the original) design will, of course, be closely followed, and, as far as funds will allow, everything will be done to preserve these marvellous relics of a lost art in their beauty.

You very properly remind me, Sir, that I am the trustee of a public fund, and that it would be well at I should state what has been collected, and what the money has been spent. The Rev. A. S. Loxley, late Vicar of Fairford, appealed to the people of this neighbourhood and county to assist in raising 2,000*l.* to restore the roof, and 1,000*l.* to preserve the windows of Fairford Church; but I found that the subscriptions were not sufficient to justify him in commencing the work. Deducting the expenses of printing and postage, the amount collected by Mr. Loxley was 466*l.* 13*s.* 3*d.*, and he received promises of some 300*l.* more. I have already published in the *Times* a list of all the subscriptions over 5*l.* paid or promised, whether by predecessor or myself. The sum now in hand available for the entire work (roof and windows) is 686*l.* 10*s.* 6*d.*. In addition there is the grant of the Warminster trustees, 500*l.*, and other promises, 182*l.*; total, 1,324*l.* 10*s.* 6*d.*

Of this sum 139*l.* has been paid, or promised definitely, for the windows; 500*l.* (the Warminster grant) for the roof and fabric; and the remainder for the general work of restoration. The Committee hope to begin next May the restoration of the nave roof and the clearing of the clearstory windows. They will carry on the work as far as the funds at their disposal will allow; possibly (if further subscriptions come in), they may be able to undertake the chancel aisle and windows also this year. The whole work will be carried out in the most conservative spirit, under the direction of Mr. Waller and Mr. Westlake. I hope, Sir, that I have now given full particulars. Allow me to add that I shall be at all times happy to furnish you with any information as to our doings here which you think may be of interest to your readers.

FRANCIS R. CARBONELL.

Fairford Vicarage, Feb. 2.

#### DRY-ROT AND SAWDUST.

SIR,—As it is a very common provision in many architects' specifications that dry sawdust be used for filling in framed partitions, and between flooring and sound-boarding, for the purpose of deadening sound, I wish to call attention to the risk thus run of communicating dry-rot to the surrounding timber. The sawdust contains particles of timber of all kinds, good, bad, and indifferent,—outside slabs (covered with vegetable and decaying matter), and rotten parts. Now, are not the chances of dry-rot thus increased one thousand-fold by this sawdust, as each of any of its particles may contain the germs of the fungus, which require only a sufficient amount of damp to spring forth and lay hold of the otherwise sound timbers around, whatever they may be. I have had over twenty-five years' experience in building, and firmly believe that this sawdust filling is a most fertile source of dry-rot, and I consider the matter well worthy the careful consideration of architects, to whose attention I would bring it through your widely-read columns.

CLERK OF WORKS.

\* \* We have not come across any cases in which dry-rot has been traced to sawdust filling; but, of course, it is understood (and should be always specified) that sawdust so used should be "stove-dried," and if heated to the highest temperature it will bear without burning, we should doubt if any pores of dry-rot or other disease could be left in

\* To be continued.

a state to fructify. Without any stove-drying, of course, the danger noted by our correspondent would be a very real one. We should, however, recommend slag-wool in preference to sawdust.—ED.

#### RED ANTS.

SIR,—I shall be glad if any of your numerous readers could tell me the best means of ridding one of my houses at the seaside of small red ants, which completely overrun it.

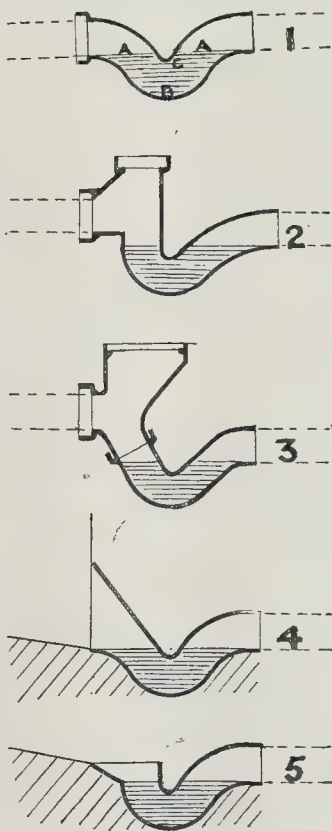
BUILDER.

#### The Student's Column.

##### TOWN DRAINAGE.

###### VI.—TRAPS.

A TRAP is a thing for preventing the flow of air through a pipe in one direction, while offering as little obstruction as possible to the flow of sewage in the opposite direction. Traps are placed in various situations, each of which requires a suitable form, as, for instance, on a line of drain, in which case the trap forms part of the drain, and through which the sewage flows continuously in the same line, as in figure 1. In some situations the continuity of the line of drain is required to be broken by a vertical shaft or chamber, for various purposes, as for access to the trap, or for admitting air to the drain, or for receiving a branch into the main drain. The trap is then placed on the lower side of the opening. Traps suitable for this situation are shown in figures



2, 3, 4, and 5. In other situations sewage may be required to enter the trap vertically and leave it horizontally, or with any slight fall which may be given to the drain; or it may enter the trap vertically and leave it at any downward angle, and in some situations it both enters and leaves the trap vertically.

In all these traps the essential part is the

same,—viz., the part shaded in the figures. The form of this part, or the throat of the trap, should be such as to offer the least obstruction to the passage of sewage. It is commonly made circular in cross section, of the same diameter as the straight pipes of the drain, and is so drawn in the figures; but it is not the best form for all the situations named above, although it is so for the first one. It will be sufficient, however, at present to keep to the more common form in this respect.

A trap on a line of drain, which forms a part of the drain, and through which the sewage flows in a continuous stream, or should do so, consists of a dip of the top of the pipe at one point below the bottom of the pipe in the adjoining part, as in fig. 1. The point C is 2 in. lower than the bottom of the drain A. The sewage lies dead in the trap below the level A, when no sewage is running in the drain. The diameter of the trap in its throat being the same as that of the drain—say 6 in.—the bottom of the trap is 8 in. lower than the bottom of the drain. The point C is sometimes attempted to be made 3 in. below the bottom of the drain, but this only increases the difficulty, and 2 in. is more usual. Less than this would be better, were it not that it is necessary to guard against the water level being reduced by evaporation below the point C. In a dry state of the atmosphere, and a long disuse of the drain, this happens, and a dip of 2 in. is little enough.

The quantity of sewage issuing from a house at any one time is in general but small, and is seldom sufficient to cause much disturbance of the dead sewage in the trap, and consequently sediment forms in the bottom. In course of time this reaches nearly to the top, C, and contracts the waterway, so that the velocity of even a small quantity of sewage passing along the drain is sufficient—if the dip be not too great—to clear a passage for itself, carrying with it from the trap as much of the old sediment, perhaps, as the new which it brings into the trap. The longer the time during which sediment is being formed before it chokes the trap, the harder it becomes, and the more difficult to move, and in course of time it all becomes solid and stops the flow of sewage,—or may do so in any case, and actually does in many. The trap must therefore be accessible from the surface of the ground.

The forms of traps shown in the accompanying sketches are elementary, drawn chiefly for the purpose of noticing the various directions and changes of direction in which sewage is required to flow under various circumstances, and for directing attention to the one principle on which they are all formed, viz., that a head of water an inch or two in height is opposed to the passage of air through the pipe. When the expansive force of the air is the same on both sides of the trap the water surface remains level, but if it be much greater on one side than the other this head of water will be overcome and the air will pass through the trap, its water being temporarily displaced by pressure on the one side only, returning again, however, into the trap after the excess of pressure on the other side has been relieved by the escape of the air of greater pressure; so that if drains are placed under circumstances which make it possible that a greater pressure of air may take place on one side of a trap than on the other,—whether by reason of the expansion caused by heat, or by an accumulation of gas generated in the drain or in a sewer with which it is connected, and which has no easier means of relieving its excessive tension than through the water-trap,—if this become possible the action indicated will take place without its being known whether it has done so or not by any inspection of the trap afterwards which may be made, for the water will be found to have returned to the trap. If air escape in this way through a trap it may become known, certainly, by its effects, but only, perhaps, when too late.

Supposing an extreme abstract case, where the common pressure of the atmosphere exists on one side of a barrier and a vacuum on the other. There would then be a pressure upon it of 14.7 lb. per square in. when mercury stands 30 in. high in a barometer. In that case it would require a column of water on the opposite side 34 ft. high to balance the pressure of the atmosphere on the other side, and the same head of water would be required if the expansive force of the air were doubled on one side of the barrier, that is if it became 29.4 lb. per square in., the ordinary pressure of the atmosphere, or 14.7 lb., being on the other side, and



the same in proportion for any actual difference of pressure, however small; and, to come to a practical case, if the expansive force of the air on one side of a trap be increased by one two-hundredth part ( $\frac{1}{200}$ ) it would remove the water from its own side of a dip 2 in. in depth which might be given to the trap, as in the sketches; and if the trap be so placed that the water on the other or far side of the trap—always looking up the drain—would begin to spread out, or run back up the drain, at the level of the standing water in the trap, this  $\frac{1}{200}$  increase of pressure, which would be to increase it from 14.7 to 14.77 lb. per square in., would be sufficient to enable the air to pass through the trap.

But if, on the far side of the trap, the water be confined so that it must rise before it can spread out, its weight must be first lifted by the expansive air before the trap can be unsealed. Suppose the trap be made so that the water must rise in this way to a height of 3 in. before it begins to run back up the drain, or escape in any other way, the pressure of the air on the other side of the trap will not overcome the weight of this water until the excess of pressure has increased by  $\frac{1}{10}$  more than that of the atmosphere, or an increase from 14.7 to 14.88 lb. per square inch. It will then begin to blow through. Suppose the maker of a trap should say 3 in. is not enough, and should make his own traps with a height of 6 in. in this particular part, thus opposing a head of water 6 in. in height against any pressure of air from the other side: the water would then have to rise 6 in. before it could begin to spread out or run away from the trap: the head would be 8 in., adding the 2 in. dip to the 6 in. head above the standing water level, and it would begin to run back up the drain when the pressure of the air on the other side of the trap might be increased by  $\frac{1}{10}$  more than the common pressure of the atmosphere, or to 15 lb. per square inch. This drop of 6 in. is the greatest of any trap made. Some have none, some 2 in., some 3 in., and so on up to 6 in. But we do not mean to say the greater the better. Whatever the drop may be it takes so much away from the fall of the drain, reducing its rate of inclination in the other parts.

As to the difference of pressure on the two sides of a trap there is a great deal of uncertainty as to its actual amount in drains and sewers. Few persons take the trouble, or have the opportunity, to make observations sufficiently numerous and extending over a sufficient length of time,—say hourly for twelve months, at least,—to establish anything which can be relied upon. The question concerns the Sanitary Committees of Corporations and Local Boards more than anybody else. They have the means, and if they had the inclination to order a series of observations to be made for their own information and guidance, so as to be able to speak authoritatively in their own town on this matter, it would be a very serviceable thing to themselves and to the people they represent.

But it is certain that a very small increase of temperature increases the elastic force of confined air in a degree quite sufficient to force it through a trap having 5 in. or 8 in. head of water, or even more. There may be an easier means of its escape than that of passing through the trap; it may, for instance, escape into the street through open gratings if they be not too far away. But, supposing the open gratings near the drain in which the increased pressure takes place to be stopped, as they sometimes are, by order of persons or committees who ought to know better, but do not, then, instead of this air, which is being increased in pressure by the discharge of hot water into the drain, or which becomes of greater temperature by any other means, travelling along a sewer until it finds an open grating, or becoming sufficiently diffused in the sewers to lose its excessive pressure, it will, rather than encounter the obstruction to its flow through the sewer to any great distance, find its easiest way of escape through a trap, which may be placed for the express purpose of stopping it, if that trap do not oppose more than the ordinary head of water to it; for, supposing this confined air to be of the ordinary temperature of 60 deg. Fahr., and to have the common expansive force of 14.7 lb. per square inch, it needs only that its temperature be raised 10 deg. or to 70 deg. Fahr. to overcome a head of water of 8 in.; 66½ deg. Fahr. to overcome 5 in.; and only 62½ deg. to remove the 2 in. depth of water formed by the ordinary dip of the trap shown in the diagrams.

## Books.

*The Theory of Perspective.* Two Lectures. By FREDERICK HARRIS. (London: Relfe Bros.)

THE author of this little work, who is head-master of the Chesterfield Central Stafford Municipal Schools of Art, appears to have been endeavouring to give the practical meaning of perspective in as simple and natural a manner as possible, with little technical language, and only three or four small diagrams. He does not use the expression "theory of perspective" as usually understood, for his first chapter is mainly taken up with the appearances of things as affected by distance and atmospheric conditions; what is usually called "aerial perspective." The remarks on this part of the subject are true and practical enough, and tend to impress on the learner's mind the fact that, in all drawing and colouring from nature, it is with appearances as modified by circumstances that he has to deal, and not with literal facts. This, however, is a matter of ordinary perception and observation, while the theory of perspective, properly so called, is a matter of scientific geometrical demonstration, and therefore to class these two subjects together under the general term "The Theory of Perspective," is rather apt to confuse the mind of the student between two classes of facts which are essentially different. The author may argue that "perspective" signifies the representation of nature as seen, and, therefore, should include atmospheric effect; but, as a matter of fact, the word "perspective" has always been applied and understood as referring to linear distortion of form in the appearance of objects, not to atmospheric alteration of tone, and nothing is gained by trying to upset an established and understood nomenclature, and to use one word to define two perfectly different classes of phenomena.

The value of the function of the vertical picture-plane, in linear perspective, is shown in the manner that has now become common, by the comparison with an interposed pane of glass, through which the objects without can be seen, and on the surface of which their outlines might be traced, and the combination of horizontal and vertical plane is illustrated by asking the student to imagine himself looking through a window upon the sea with its horizon, and he will then have the horizontal perspective plane and the vertical picture-plane in combination. This and some other points are illustrated in a manner calculated to bring them home to the comprehension of the student; but we doubt whether any one would learn to practically work out a perspective drawing from this lecture: there is such a thing as trying to be too simple in description and in diagram. The reason for the existence of vanishing lines and vanishing points might certainly have been explained more philosophically than is attempted here; in fact, it is not really attempted, but referred to as a kind of mystery of Nature, to be accepted without explanation. The proper explanation is that two parallel lines appear to vanish into a point when they are so distant that the limited defining power of the eye can no longer separate them or measure the angle they subtend. The author is in danger of producing confusion in the student's mind by speaking of the visible horizon of the globe as if it were the same thing as the theoretic vanishing line of the perspective plane; to a great extent it is so practically, but it is not well to accustom students to confound in their minds phenomena which are essentially distinct. Indeed, the author seems under some confusion in his own mind on the subject, as he says:—"The form of our world has also something to do with this appearance, and what seems to us horizon, over sea, is probably the extreme visible curve fore-shortened and condensed, forming the contour of the earth." That is certainly the first time we ever met with this statement as a "probably." How would Mr. Harris's pupils, we should like to know, be taught to account for the fact that after a ship is "hull down," and, therefore, beyond the visible horizon, her sails can still be seen subtending an easily measurable angle to the eye? However, the author is, we gather, a "departmental" art teacher (the book is intended for the use of students preparing for the second-grade examination), and this is not the first time we have found evidence that departmental masters are

apt to be somewhat illogical in their theories of perspective.

*St. Martin's-on-the-Hill, Scarborough, and its late Vicar, the Rev. R. H. Parr.* By the Rev. NEWTON MANT, B.A. Cantab. (London: Simpkin, Marshall, & Co. (Scarborough: E. T. W. Dennis).)

THIS little work, the major portion of which is reprinted from the *Church Times* and the *Yorkshire Weekly Post*, is written in memory of the late Vicar, who will long be remembered in Scarborough as the founder of a remarkable church and the centre of a large and earnest congregation. The church, which was consecrated in 1863, is a prominent feature on the heights above the town, and has a befitting individuality. It was designed by Mr. Bodley, and added to in 1879 by Messrs. Bodley & Garner. The adornment of the interior has employed some of the foremost artists of the day—Burne Jones, Ford Madox Brown, William Morris, Spencer Stanhope, and others.

Mr. Aston Webb has drawn, so says the Rev. historian, the cartoons for the stained glass, and has decorated, in company with Burne Jones, the chancel roof. In the short biographical notice which, in common with the other eminent artists employed, Mr. Aston Webb is favoured with, it is admitted that his work has been "mainly architectural," and although we are prepared to believe anything as to Mr. Aston Webb's skill as an artist, we cannot help thinking that some mistake has here crept into the otherwise veracious narrative.

The book is neatly presented (although the illustrations of the church are far below its merits), and will, no doubt, find a hearty welcome amongst the late Vicar's parishioners and admirers.

*Walks in the Ardennes. Cycling, Driving, Boating, by Rail, and on Foot.* With some fishing and shooting notes. Edited by PERCY LINDLEY. Pen-and-ink sketches by J. F. WREDDON. (Published at 125, Fleet-street, London.)

THE real originators of this book are probably the Great Eastern Railway Company, who naturally desire to bring before the touring public the attractions of the districts to which their lines of railway and steamships give the readiest access. They have entrusted the work to capable hands, and the result is a pleasant little book of sixty-seven pages, well written and well illustrated, and sold at a merely nominal sum. An excellent route-map affords the basis of a description of suitable walks in the "Forest of Arden," which must be seen soon if at all, for it is suffering the usual fate of districts which are advertised, and is fast losing much of what made it attractive. The tramway is superseding the diligence, and a decrease of picturesque quality and an increase in the cost of everything are supervening. However, there is yet time, and the tourist who is forecasting his next autumn's holiday will do well to bend his steps towards the Ardennes, and cannot do better than slip into a spare pocket this light, thin, handy, chatty, genial guide.

**The English Iron Trade.**—The English iron market is strong, and is getting more active than it was at the beginning of the year. Besides the rising tendency manifested in finished iron and steel, to which reference was made last week, pig-iron is experiencing a slightly upward movement. The Glasgow warrant market has somewhat improved, while the north-country pig-iron trade is better, the favourable nature of the ironmasters' returns of stocks having had a stimulating effect. Inquiry in Lancashire is fairly well sustained, and prices are steady. The Staffordshire pig-iron market is firm. Hematites are quoted 6d. a ton higher this week in the north-west, there being an improvement in the demand, which has enabled makers to be stiffer in their prices. Spiegeleisen has advanced 2s. 6d. a ton. Manufactured iron continues fairly active. Tin-plates are quiet, but steady. The steel trade has received a further impulse this week, and prices are rising. Rails have gone up 5s. a ton in the north-west, and 2s. 6d. in the north of England, the demand being very brisk. Blooms and slabs have gained 1s. 6d. a ton. There is a very heavy consumption of shipbuilding steel, without any further improvement in value, however. Shipbuilders are still receiving additional orders. Some engineers have more work offered them than they can undertake.—*Iron.*



## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

2,605, Cooling, Ventilating, &c. E. Dean.  
For cooling buildings and apartments in hot countries without excluding the light, glass louvers or slats are, according to this invention, used. These are mounted on frames or screens. On the framing of the screen is fixed a perforated water-pipe, so that water is sprayed on to the louvers. These louvers may be covered with fabric or stained, if it is desired to subdue the light.

3,178, Partitions for Dividing Rooms. T. Cook.

Revolving sliding partitions, glazed or decorated, are proposed to be used by this inventor. Each leaf of the partition is hung at the top, and furnished with a swivel, a pulley, and rail, by which the partition leaves are moved against the side walls of the room. The partition, when in use, is bolted to the floor, a wood slip keeping them straight in line.

3,513, Dressing, Grinding, or Cutting Stone. W. Rigby.

According to this invention, a travelling-frame is used, on which the slab of stone to be operated upon is placed. Above this rollers or grinders are placed, of a shape the converse of the moulding desired to be cut on the stone. A weight causes the travelling-frame, with the stone upon it, to be drawn under, and in contact with the grinder.

3,641, Cellar Gratings. G. Humphrey.

The grating which is the subject of this invention is formed of cross-bars, and immediately underneath are another similar frame. A small socket and slot are fixed in the centre, so that when one is pushed behind or below the other, after the manner of sliding ventilators, the openings are closed or opened as desired.

17,554, Furniture Polish. M. A. Harrach.

In order to avoid the use of oil, and instead of using ether as a solvent in making up the polish, spermaceti, palmitine, stearine, or some such compound is used by this inventor.

17,681, Fire-escape. C. Brawn.

According to this invention, flat rope or web is used, and passed through a plate perforated with small slits or holes. These regulate the sliding of the rope through the plate. A webbing sling is provided, and when the weight comes on the appliance, a descent is easily and safely made, the speed being regulated by the person holding the rope drawing it tighter or letting it run freer as desired. The rope has an eye at either end, so that after the descent is made the little appliance is pulled up from below, and is again ready for operation.

## NEW APPLICATIONS FOR PATENTS.

Jan. 21.—1,071, J. Wilkie, Builders' Cramps.—1,086, C. Brawn, Appliance for Cleaning or Repairing Windows.

Jan. 22.—1,120, B. Smith and F. Taylor, Tile and Gutter for Roofing, &c.—1,128, J. Keeler, Hinge for Stairs.—1,168, W. Woodward and J. Walton, Lock or Lock-fastening for Doors.

Jan. 23.—1,221, M. Adams, Gully Traps.—1,224, J. Milne, Flushing Apparatus for Water-closet Cisterns, &c.—1,240, E. Cory and others, Motive Power Mortising Machines.—1,262, A. McLean, Artificial Stone.—1,268, W. Lorenz, Straight and Circular Saws, &c.

Jan. 24.—1,281, A. Hewson and S. Bradley, Window-sash and Casement Fastener.—1,282, J. Hannay, White Lead, &c.—1,300, O. Christie and F. Mason, Draught-preventer.—1,312, J. Barrow, Chimney-tops.—1,322, J. Read, Bakers' Ovens.—1,346, J. Hall, White Lead.

Jan. 25.—1,363, J. Clayton and C. Tindall, Water-closets.—1,386, F. Rosentrotter and W. Caldwell, Sash-balance.—1,403, J. Clarke, Revolving Window-frames.—1,415, E. Maldant, Water-meter.—1,422, T. Oakley and E. Smith, Ventilation of Buildings, &c.

Jan. 26.—1,435, A. Fowler, Privies and Water-closets.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

14,596, R. McKeeman and S. Pillar, Raising Water-closet Seats.—16,670, M. Chanlin, Locks and Latches.—17,823, J. Carter, Water-closets.—17,839, J. Cole, Ventilating Sash-fasteners.—17,885, W. Lark, Plumb Rule.—18,160, R. Barr, Self-locking Safety Latch.—18,244, A. Martyn, Decorative Panels, &c.—18,451, E. and J. Brook, Kilns.—18,491, W. Joy, Preparation of Slurry for Cement, &c.—18,637, G. Jones, Water-closets, &c.—19,038, F. Baker, Door Curtain Rods.—19,064, T. Cantwell and R. Randall, Flooring.—25, R. Hepburn, Sign Letters, &c.—63, O. Earl, Outside Shop Fittings.—234, A. Eldridge, Opening and Closing Panlights, &c.—495, F. Carter and others, Combination Nail and Screw.

## COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

1,515, C. Eissner, Machines for Cutting Clay for Bricks, Tiles, &c.—3,560, J. Kaye, Handles for

Doors and Locks.—4,413, B. Lee and T. Neale, Producing a Marbled or Grained Enamelled Surface on Cast Iron.—4,660, E. Shonland, Air-warming Arrangements for Fireplaces and Stoves.—4,757, N. Davis and T. Turner, Automatically Distributing Disinfectants, &c., into Flushing Cisterns and Water-closets, &c.—4,908, W. and W. H. Cowan, Flushing Cisterns.—5,205, C. Smiles and W. Davidson, Matchboards for Partitioning, Wainscoting, Flooring, &c.—5,317, G. Clarke, Joints or Hinges for Panlights, &c.—7,933, C. Wheeler, Automatic Flush-bolt for Folding Doors or Windows.—14,881, T. Bromly, Combination Machine Tool.—17,677, J. Charles, Fret-saw Machine.—18,896, F. Hunter, Roofing Tile.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

JAN. 29.

By FURBER, PRICE, & CO.

Pimlico—Profit-rent of £16, term 35 years ..... £330  
King's Cross—8, Regent-square, 16 years, ground-rent £14 ..... 260

10 to 13, Argyle-square, freehold ..... 3,665  
2 to 5, Manchester-street, 22 years, ground-rent £16 ..... 1,280

By DEDDENHAM, TEWSON, & CO.

Bayswater—69, Princes-square, 83 years, ground-rent £21 ..... 1,180

By A. RICHARDS.

Lincolns—39, 41, and 43, Rhodeswell-road, 37 years, ground-rent £15 ..... 410

Edmonton—A ground-rent of £15, reversion in 78 years ..... 315  
A ground-rent of £20, reversion in 78 years ..... 420

By VACCHAN & CO.

Hampstead-road—22, Robert-street, 34 years, ground-rent £10 ..... 735

47, Robert-street, 32 years, ground-rent £7, 7s. ..... 650  
Camden Town—Ground-rent of £5, reversion in 12½ years ..... 375

By RUTLEY, SON, & VIVAS.

Easton-square—42, Gower-place, 18 years, ground-rent £3 ..... 350

Hampstead-road—64, Arlington-road, 11 years, ground-rent £2 ..... 200

Easton-road—46, Barton-street, 16 years, ground-rent £21 ..... 200

JAN. 30.

By WAGSTAFF & WARMAN.

Marylebone—33, Crawford-street, 18 years, ground-rent £21 ..... 500

JAN. 31.

By DIXON & CO.

Notting-hill—313, Portobello-road, 74 years, ground-rent £3 ..... 280

By ROBINSON & SONS.

Beckenham—1 and 2, Richmond-villas, freehold ..... 665

By G. A. WATKINSON.

Harrow—Three plots of freehold land ..... 111

By J. G. & A. PARVOZ.

Bromley, E.—37 and 69, Bruce-road, 68 years, ground-rent £10 ..... 500

88, St. Leonard-street, 80 years, ground-rent £4 ..... 655  
90, St. Leonard-street, 80 years, ground-rent £5 ..... 450

18, 20, and 21, Grace-street, freehold ..... 800

By F. HANES.

Lewisham—28 and 27, Horton-street, 74 years, ground-rent £13 ..... 420

21, Jerrard-street, 74 years, ground-rent £2, 10s. ..... 156  
47, Higher Green-lane, 77 years, ground-rent £2, 18s. ..... 156

14 and 16, Thurston-road, 74 years, ground-rent £4, 8s. ..... 455

Greenwich—Ground-rent of £40, reversion in 18 years ..... 820

Croydon, Dagnall Park—Ground-rent of £3, reversion in 66 years ..... 265

Shepherd's Bush—13 and 15, Warbeck-road, freehold ..... 780

Fawkham—Three freehold enclosures of land, 10a 2r. 23p. .... 310

Blackheath—4 and 6, Mycene-road, freehold ..... 810

FEB. 1.

By JONES, LANG, & CO.

City—162a, Queen Victoria-street, 97 years, ground-rent £7, 10s. ..... 4,950

Bromley-by-Bow—Ground-rents of £35, 3s., term 64 years ..... 690

## MEETINGS.

SATURDAY, FEBRUARY 9.

Architectural Association.—Visit to Palace Court, Kensington. 3 p.m.

Edinburgh Architectural Association.—Visit to Free Library and Edinburgh University Union Buildings.

MONDAY, FEBRUARY 11.

Royal Institute of British Architects.—(1) To receive the Council's nomination for the Royal Gold Medal. (2) Sir Richard Temple, Bart., M.P., on "The Application of Art to Architecture, Indian and Other." 8 p.m.

Royal Academy.—Professor Aitchison, A.R.A., on "Roman Architecture." V. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. W. J. Linton on "Wood Engraving." 8 p.m.

Royal Institution.—Professor J. W. Judd, F.R.S., on "The Metamorphoses of Minerals." IV. 8 p.m.

London Institution.—Mr. Shefford Edgewell on "Some Curiosities of Magnetism." 6 p.m.

Clerks of Works' Association.—Sixth Annual Dinner, Holborn Restaurant. 8.30 p.m.

TUESDAY, FEBRUARY 12.

Institution of Civil Engineers.—Mr. L. F. Vernon-Harcourt, M.P., on "Some Canal, River, and Other Works in France, Belgium, and Germany." 8 p.m.

WEDNESDAY, FEBRUARY 13.

Carpenters' Hall (London-wall).—Professor A. B. W. Kennedy, F.R.S., on "Strength of Iron and Steel." 8 p.m.

Inventors' Institute.—8 p.m.

Society of Arts.—Mr. P. Lund Simmonds on "Salt; its Production and Consumption at Home and Abroad." 8 p.m.

THURSDAY, FEBRUARY 14.

Royal Academy.—Professor Aitchison, A.R.A., on "Roman Architecture." VI. 8 p.m.

Sanitary Institute.—Dr. E. A. Whitelegge on "Notification of Infectious Diseases." 8 p.m.

Society for the Encouragement of the Fine Arts.—Dr. R. W. Richardson, F.R.S., will read some chapters from his recent work, "The Son of a Star." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Institution of Electrical Engineers.—(1) Conclusion of Discussion on Professor A. Jamieson's paper on "The Insulation Resistance of Electric Lighting Circuits." (2) Mr. A. E. Kennelly on "Certain Phenomena connected with imperfect earth in the Telegraph Circuits." 8 p.m.

FRIDAY, FEBRUARY 15.

Architectural Association.—Mr. J. M. Brydon on "The English Classic Revival of the Seventeenth and Eighteenth Centuries." 7.30 p.m.

Royal Institution.—Professor A. W. Rucker, M.A., F.R.S., on "Electrical Stress." 8 p.m.

Society of Arts (Indian Section).—Mr. G. S. Streeter on "The Ruby Mines of Burmah." 8 p.m.

## Miscellaneous.

Gassner's Dry Battery for Electric Bells, &c.—We have had an opportunity of seeing this improved form of battery for electric bell installations, &c. For batteries for such purposes many so-called dry elements have been introduced from time to time, but they have not been brought into general use, notwithstanding the desirability of such a cell for many purposes. In the "Gassner Dry Cell" it is claimed, and with good show of reason, that all the previous difficulties have been overcome.

The Gassner dry-cell has been on its trial for nearly two years, and has been approved and extensively used by electricians, both in this country and abroad, in place of the Leclanché cell, of which it seems to possess all the advantages without sharing its deficiencies. Its form is more compact than the Leclanché, it will work as long a time from beginning to end, and gives a more constant current. The outer case is of zinc, which is not liable to break, a great advantage over the ordinary glass or earthenware cells, and the absence of any solution in the cell, either free or held by an absorbent material, as sponge, cotton-wool, and the like, guarantees absolute cleanliness; there is therefore no creeping, and consequent corrosion of terminals; and the apparatus requires no attention when once started to work. The battery therefore seems to be specially adaptable for use in private houses, hotels, offices, railways, field-telegraphy, testing purposes, &c. The cells are supplied ready for use, and will, we are assured, work well until completely exhausted; they require no cleaning of the zinc, or renewal of the sal-ammoniac; this renders the battery cheaper and more pleasant to use; and then, as a still further advantage, after being completely exhausted, the cells can be completely renovated (indeed, it is said, the condition is then even better than at first) by passing the current from Bunsen's cells, in a similar manner to the charging of a storage battery. The Gassner cells can be put into any position, upright, upside down, or on their sides, whichever may be most convenient; they may be used in places subject to high temperatures, gas factories, boiler rooms, &c., and they are not affected by severe cold; when at rest no chemical action takes place. Messrs. Mayfield, Cobb, & Co., of 35a, Queen Victoria-street, E.C., are the manufacturers.

The Norwegian Brick Industry.—The Norwegian brick industry, which, on account of foreign competition, has been dull during recent years, revived somewhat last year, although the production was less than in former years. At fifteen works, 30 million bricks were turned out, and one million roof-tiles. The price was 20s. per mille, as against 23s. 10d. in 1887. The sale last year was steady, and the stocks at the end of the year were much smaller than at the end of 1887. The price of calcined roof tiles was 22 7s. 6d. The works employed about 1,000 labourers.



**The Society of Engineers.**—The first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, February 4, at the Town Hall, Westminster. Mr. Arthur T. Walmisley, the President for 1888, first occupied the chair, and presented the premiums of books awarded for papers read during his year of office. The "President's Premium" was presented to Mr. Henry Faija for his paper on "The Effect of Sea Water on Portland Cement." The "Bessemer Premium" was presented to Mr. C. Nicholson Lailey for his paper on "The Acton Main Drainage Works." A Society's Premium was presented to each of the following gentlemen, viz.:—To Mr. Worby Beaumont for his paper on "High Pressure Steam and Steam Engine Efficiency," to Mr. W. Santo Crimp for his paper on "The Wimbledon Main Drainage and Sewage Disposal Works," to Mr. H. Ross Hooper for his paper on "The Practice of Foundry Work," to Mr. Wm. Lawford, for his paper on "Light Railways," and to Mr. E. Perrett, for his paper on "Filtration by Machinery." Mr. Walmisley introduced the President for the present year, Mr. Jonathan R. Baillie, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. Mr. Baillie then took the chair, and proceeded to deliver his inaugural address. After thanking the members for having elected him to the chair, Mr. Baillie alluded to the satisfactory position of the Society, and reviewed the work of the past year as regards the reading of papers and the visits to engineering works. He briefly commented on each of the papers read, and touched on the works inspected during the vacation, which included the Tower Bridge, the precipitation works at the Barking sewage outfall, and the new locomotive and carriage works of the London and South-Western Railway at Nine Elms. The President then referred to the progress made in electric lighting during the past year, and gave particulars of the great central electric-lighting station at Deptford, which has been designed to supply London with the electric current for 450,000 glow lamps by means of engines of 25,000 combined horse-power. Eventually it is proposed to extend the works to equal a supply of current for two million glow-lamps distributed over the metropolis. He also gave particulars of the Kensington electric-lighting station, which was recently opened. The progress of the works of the Manchester Ship Canal and of the Corinth Canal were then referred to, after which the President described the proposed Bristol and English Channel Canal, the proposed Scottish Canal, and the proposed Swedish Canal. A reference to the present position and prospects of the Panama Canal closed this section of the address. From canals the President proceeded to notice the Tient-sin Railway in China, and the Nova Scotia Ship Railway, both of which are in course of construction. The progress of the Forth Bridge was then noticed, and also that of the Sakkar Bridge in India, which has been made by the President's firm, and which will be opened to railway traffic next month. Until the Forth Bridge is completed the Sakkar Bridge will be the largest span bridge in the world, its span being 790 ft. between the piers. The President concluded an able and interesting address by a passing reference to the Channel Tunnel scheme, which he criticised adversely from a commercial point of view.

**Rabitz' Patent Wall and Ceiling Material.**—The composition invented and patented some while ago by Herr Rabitz, a Berlin engineer, is becoming much used in Germany and the Scandinavian countries, particularly for thin partitions in buildings, light ceilings, roofing, &c., especially where inflammability is necessary; whilst recently a Royal Commission appointed at Christiania for considering the best means for rendering unprotected iron columns, &c., in houses, safe in case of fire, has now decided that all such must be covered with the Rabitz composition. In Sweden and Denmark, too, the material finds much favour with architects for lighter purposes. The German *Bauseitung* adds that its cost is not very great, the cost of a partition wall 5 centimètres in thickness being the same as one of single bricks.

**Sewerage Scheme for Sutton, Surrey.**—We are informed that the Local Board of Sutton, Surrey, have instructed Messrs. Bailey Denton, Son, & North, of Westminster, to prepare a scheme of sewerage and sewage disposal for their district.

**The National Freehold Land Society.**—The thirty-ninth annual report of this Society, submitted to the members at the meeting on the 1st inst., states that the subscriptions during the year ending October 31, 1888, amounted to 422,678*l.*, the withdrawals to 456,998*l.*, and the members' capital at the end of the year was 1,665,077*l.*; that the freehold and leasehold securities and properties amount to 1,494,705*l.*, and the convertible securities to 233,825*l.*; that the rate of profit on uncompleted shares has been 3 per cent., and the interest on completed shares 3½ per cent., throughout the year; that the gross revenue for year was 70,256*l.* Of this sum the profit added to uncompleted shares, and the interest on completed shares, amounted to 57,158*l.* After paying all expenses, there is a net balance of 3,009*l.* to be carried to the credit of the reserve fund. After writing off 4,334*l.*, losses on properties sold, the reserve fund now stands at 53,419*l.* The Board lament the loss which the Society has sustained by the death of two of the directors since the last annual meeting, viz., Mr. William Milward and Mr. John Francis Bontems, the latter of whom had been a director for thirty-six years and a trustee for ten years. The vacancy caused by the decease of Mr. William Milward was filled up by the election of Mr. Samuel Wright, who had been annually appointed by the members as auditor for a period of fourteen years. Mr. William Elliott Whittingham was unanimously elected a trustee in August last, and the vacancy on the Board thus caused has been filled up by the appointment of Mr. Frederick William Rowlatt, Secretary of the Society for the last seventeen years. Mr. J. A. Fisher, who has served the Society for a period of thirty-six years, has been elected as Mr. Rowlatt's successor.

**Ancient Mode of Water-supply.**—The water-supply of Tokio, Japan, is by the wooden water-pipe system, which has been in existence over 200 years, furnishing at present a daily supply of from 25 to 30 million gallons. There are several types of water-pipes in use, the principal class being built up with plank, square, and secured together by frames surrounding them at close intervals. The pipes less than 6 in. consist of bored logs, and somewhat larger ones are made by placing a cap on the top of a log in which a very large groove has been cut. All the connexions are made by chamfered joints, and cracks are caulked with an inner fibrous bark. Square boxes are used in various places to regulate the uniformity of the flow of the water, which is rather rapid, for the purpose of preventing aquatic growth. The water is not delivered to the houses, but into reservoirs on the sides of the streets, nearly 15,000 in number.—*Indian Engineer.*

**The Formation of Petroleum.**—The *Schweizerische Bauzeitung* states that a Russian professor, M. Mendeleeff, has advanced a new theory respecting the formation of petroleum. Whilst petroleum hitherto has been considered a precipitate produce of carbons, this savant is of opinion that petroleum is formed by water percolating the earth's crust, and coming in contact with red-hot carbonic metals, particularly iron. The water then dissolves into oxygen and hydrogen, the former combining with iron, and the latter with carbon, rising to upper strata, where it becomes condensed to a mineral oil. If Professor Mendeleeff's theory be correct, and the earth contains a sufficient quantity of such metals, petroleum may continue to furnish a fuel to the world long after its coal deposits are exhausted. This savant bases his theory on the fact of having produced artificial petroleum by a process like that described.

**Flour Mills, Grimsby.**—The extensive flour mills of Messrs. William Marshall & Sons, Victoria-street, Grimsby, recently destroyed by fire, will shortly be re-erected, from the designs and under the superintendence of Mr. E. W. Farebrother, architect, Grimsby, and Messrs. Houghton & Co., consulting engineers to the firm. The buildings will be of the most improved construction throughout, and will consist of a mill entirely faced with glazed bricks, fire-proof engine-room, stone staircase throughout, and extensive warehouses. The buildings will be surmounted with a water and clock-tower upwards of 100 ft. in height. The machinery throughout will be arranged on the latest and best-known systems in roller-milling, and it is estimated that the cost of the entire scheme will exceed 70,000*l.*

**Fawcett's Fireproof Floor.**—We have this week seen, at the new and extensive premises now nearing completion in The Grove, Southwark, for Messrs. Barclay & Fry, printers and lithographers (Mr. J. Douglass Mathews, architect), a new system of fireproof flooring, the invention of Mr. Mark Fawcett, architect. It consists of a series of half-round fireclay tubes, about 2 ft. long, placed diagonally between the rolled-iron joists in such manner as to cover and protect the flanges of the joists. The bottom of the tubes is flat in shape, and keyed for plaster. The fireclay tubes are easily and rapidly placed in position, and form a centering for the concrete, allowing the latter to take a direct bearing on the lower flange of the joist between each tube. By this means a light but very strong and cheap fireproof floor is constructed. It is one of the best systems of fireproof flooring we have seen, and is likely to be much in demand when it is more widely known. We will in an early number give sections and other details showing its construction. It has been on view during the past week, and on Saturday last was tested as to strength in the following manner:—A board, 7 in. wide and 1½ in. thick, was placed over the centre of two shire bricks, weighing 8½ lbs. each, were placed thereon in twenty-seven courses, making a central load of upwards of 10 cwt., without the tubular lintels showing the least sign of fracture. The test could not be continued further, as the pier was only 9 in. thick, and would only just stand upright.

**Large Flagstones.**—The largest lot of flagstones ever quarried on one order in the United States are those intended to form the side-walk, or foot pavement, in front of Mr. Frederick Vanderbilt's new house in Fifth Avenue, New York. They come from the Clark Quarry, near Oxford, on the Ontario and Western Railroad, and are being dressed at Hastings-on-Hudson. The flagstones are about twenty in number, 20 ft. long, from 10 ft. to 15 ft. in width, and about 20 in. thick, and weigh from 12 to 20 tons each. Special flat cars of extra strength had to be constructed for carrying them, and special machinery is employed in loading and unloading the great slabs. It is estimated that the flags, when laid in place, will have cost about 1,000 dol. each. The largest flagstones hitherto laid down in New York were those forming the pavement in front of the Equitable Buildings, but they are now eclipsed both in size and weight by the Vanderbilt stones.

**A New Presbyterian Church.**—The opening service was held at St. George's Presbyterian Church, Willesden-lane, Brondesbury, N.W., on the 1st instant. The building accommodates nearly 600 persons, and has been built at a cost of 3,500*l.*, including lighting, heating, and ventilating. The walls are faced inside and out with red Suffolk bricks, and the roofs are covered with Broseley tiles. The style is Gothic of an Early English type. The works have been carried out by Messrs. Allen & Sons, of Kilburn, under the direction of the architect, Mr. Henry S. Tyack.

## PRICES CURRENT OF MATERIALS.

|                                              | TIMBER. | £. | s. | d. | £. | s. | d. |
|----------------------------------------------|---------|----|----|----|----|----|----|
| Greenheart, B.G.                             | .....   | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                                   | .....   | 9  | 0  | 0  | 14 | 0  | 0  |
| Sequoia, U.S.                                | .....   | 6  | 2  | 0  | 3  | 0  | 0  |
| Ash, Canada                                  | .....   | 3  | 10 | 0  | 6  | 0  | 0  |
| Birch "                                      | .....   | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm "                                        | .....   | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantsic, &c.                            | .....   | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak "                                        | .....   | 2  | 0  | 0  | 4  | 0  | 0  |
| Canada "                                     | .....   | 5  | 10 | 0  | 7  | 0  | 0  |
| Pine, Canada red                             | .....   | 3  | 5  | 0  | 4  | 0  | 0  |
| Oak "                                        | .....   | 7  | 10 | 0  | 6  | 10 | 0  |
| Larch, Dantsic                               | .....   | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg                               | .....   | 5  | 0  | 0  | 8  | 10 | 0  |
| Waincoat, Riga, &c.                          | .....   | 2  | 15 | 0  | 4  | 0  | 0  |
| Oak, Odessa, crown                           | .....   | 2  | 15 | 0  | 3  | 6  | 0  |
| Danish, Finland, 2nd and 1st                 | .....   | 9  | 0  | 0  | 10 | 0  | 0  |
| Riga "                                       | .....   | 7  | 0  | 0  | 8  | 10 | 0  |
| St. Petersburg, 1st yellow                   | .....   | 10 | 0  | 0  | 15 | 0  | 0  |
| " 2nd "                                      | .....   | 9  | 0  | 0  | 10 | 0  | 0  |
| " white "                                    | .....   | 8  | 0  | 0  | 10 | 0  | 0  |
| Sweden "                                     | .....   | 7  | 10 | 0  | 18 | 0  | 0  |
| White Spruce                                 | .....   | 8  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                            | .....   | 18 | 0  | 0  | 26 | 10 | 0  |
| " 2nd "                                      | .....   | 11 | 0  | 0  | 17 | 10 | 0  |
| " 3rd "                                      | .....   | 7  | 10 | 0  | 10 | 0  | 0  |
| " Spruce, 1st                                | .....   | 9  | 10 | 0  | 10 | 0  | 0  |
| " 3rd and 2nd "                              | .....   | 7  | 0  | 0  | 8  | 10 | 0  |
| Danish, New Brunswick, &c.                   | .....   | 6  | 10 | 0  | 10 | 0  | 0  |
| Belgian, all kinds                           | .....   | 6  | 10 | 0  | 12 | 0  | 0  |
| Flooring Boards, sq., 1 in., prepared, First | .....   | 0  | 11 | 0  | 0  | 14 | 6  |
| Second                                       | .....   | 0  | 5  | 0  | 0  | 10 | 9  |
| Other qualities                              | .....   | 0  | 5  | 6  | 0  | 7  | 9  |



| TIMBER (continued).                     |        |        |        |
|-----------------------------------------|--------|--------|--------|
| dar, Cuba, .....                        | foot   | 0 0 32 | 0 0 44 |
| Honduras, .....                         | 0 0 32 | 0 0 44 |        |
| Australian, .....                       | 0 0 32 | 0 0 44 |        |
| Shagbary, Cuba, .....                   | 0 0 44 | 0 0 56 |        |
| St. Domingo, cargo average, .....       | 0 0 44 | 0 0 56 |        |
| Mexican, .....                          | 0 0 44 | 0 0 56 |        |
| Shagbary, Tobasco, cargo average, ..... | 0 0 44 | 0 0 56 |        |
| Honduras, .....                         | 0 0 44 | 0 0 56 |        |
| ox, Turkey, .....                       | ton    | 5 0 0  | 12 0 0 |
| ase, Rio, .....                         | ton    | 13 0 0 | 19 0 0 |
| Bahia, .....                            | 13 0 0 | 19 0 0 |        |
| atin, St. Domingo, .....                | foot   | 0 0 6  | 0 1 0  |
| Porto Rico, .....                       | 0 0 9  | 0 1 3  |        |
| alant, Italian, .....                   | foot   | 0 0 44 | 0 0 88 |

| METALS.                         |        |       |  |
|---------------------------------|--------|-------|--|
| at works in Wales, .....        | 4 17 6 | 5 0 0 |  |
| Staffordshire, in London, ..... | 5 15 0 | 7 0 0 |  |

| METALS (continued).           |         |         |        |
|-------------------------------|---------|---------|--------|
| Lead—Fig, Spanish, .....      | ton     | 13 2 6  | 13 6 0 |
| English, common brands, ..... | 12 17 6 | 0 0 0   |        |
| English, .....                | 14 10 0 | 0 0 0   |        |
| Silesian, special, .....      | ton     | 17 17 6 | 18 0 0 |
| Ordinary brands, .....        | 17 15 0 | 17 17 6 |        |
| Straits, .....                | ton     | 97 0 0  | 0 0 0  |
| Australian, .....             | 97 0 0  | 0 0 0   |        |
| English Ingots, .....         | 100 0 0 | 0 0 0   |        |
| Zinc—English sheet, .....     | ton     | 21 0 0  | 22 0 0 |

| OILS.                        |         |         |        |
|------------------------------|---------|---------|--------|
| Linseed, .....               | ton     | 18 17 6 | 19 2 6 |
| Cocanut, Cochia, .....       | 23 0 0  | 29 10 0 |        |
| Ceylon, .....                | 26 15 0 | 0 0 0   |        |
| Palm, Lagos, .....           | 27 15 0 | 0 0 0   |        |
| Bapedee, English pale, ..... | 31 15 0 | 0 0 0   |        |
| "    brown, .....            | 30 5 0  | 0 0 0   |        |
| Cottonseed, refined, .....   | 25 10 0 | 0 0 0   |        |
| Tallow and Oleine, .....     | 19 0 0  | 45 0 0  |        |
| Lubricating, U.S., .....     | 5 0 0   | 6 0 0   |        |
| "    refined, .....          | 7 0 0   | 12 0 0  |        |
| Tax—Stockholm, .....         | barrel  | 1 3 0   | 1 2 6  |
| "    Archangel, .....        | 0 13 9  | 0 0 0   |        |

COMPETITIONS, CONTRACTS & PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

| Nature of Work.                       | By whom Required.            | Premium.                | Designs to be delivered. | Page. |
|---------------------------------------|------------------------------|-------------------------|--------------------------|-------|
| Magistrates' Court and Police Station | Bootham-Linacre Corporation. | 50, 30, and 20 guineas. | May 6th                  | ii.   |

| CONTRACTS.                                   |                                   |                                   |                          |       |
|----------------------------------------------|-----------------------------------|-----------------------------------|--------------------------|-------|
| Nature of Work, or Materials.                | By whom Required.                 | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
| Works and Materials                          | Willenden Local Board             | O. Claude Robson                  | Feb. 13th                | xiii. |
| on Fencing, Ravenscourt-park                 | Hammersmith Public Library Comms. | E. F. Roberts                     | do.                      | xiii. |
| admaking and Paving Works                    | Hammersmith Vestry                | Official                          | Feb. 13th                | xiii. |
| Supply of Crumey and Hartshill Stone         | Abingdon Highway Bd.              | C. Tame                           | Feb. 16th                | xi.   |
| rick Sewer Ventilating Shaft                 | Fitchley Local Board              | G. W. Brunell                     | Feb. 18th                | xiii. |
| Additional Subsidizing Tanks, Carriers, &c.  | Hawwell Local Board               | E. J. W. Herbert                  | do.                      | xi.   |
| ed Materials, &c.                            | St. Helen's Corporation           | G. J. C. Broom                    | do.                      | xii.  |
| ernsey Granite, Kentish Ragstone, &c.        | Vestry                            | Official                          | do.                      | xi.   |
| umber, &c.                                   | do.                               | do.                               | do.                      | xi.   |
| ver Works, Supply of Drainfascants, &c.      | do.                               | do.                               | Feb. 19th                | xi.   |
| erbing, Tar-paving, &c.                      | Lewisham Bd. of Wks.              | do.                               | do.                      | xi.   |
| umps and Fittings                            | Tottenham Local Bd.               | J. E. Worth                       | do.                      | xii.  |
| admaking and Paving Works                    | do.                               | do.                               | do.                      | xii.  |
| avel and Tar-paved Footpaths, Eel Brook Com  | Southern Local Board              | P. Dodd                           | do.                      | xi.   |
| agement of Post Office, Torquay              | Met. Board of Works               | Official                          | do.                      | xi.   |
| admaking and Paving Works                    | Cam. of H. M. Works               | do.                               | Feb. 20th                | ii.   |
| orks and Materials                           | Fulham Vestry                     | J. P. Norrington                  | do.                      | xi.   |
| rest Improvements                            | St. Mary (Islington) Vestry       | Official                          | Feb. 22nd                | xii.  |
| Improvement Works, North Deal                | St. Helen's Corporation           | G. J. C. Broom                    | Feb. 23rd                | xii.  |
| removal of Stuffs to be dredged              | Deal Town Council                 | A. Dryland                        | Feb. 25th                | xii.  |
| orks and Materials, Portsea Sub-District     | War Department                    | Official                          | do.                      | xi.   |
| verage Works                                 | Charley Corporation               | do.                               | do.                      | xiii. |
| nduct over River Oak                         | G. W. Ky. Co.                     | do.                               | Feb. 26th                | xiii. |
| essenger Station, &c., Clevedon              | do.                               | do.                               | do.                      | xi.   |
| Stages, Homes, Schools, Store Rooms, &c.     | Wolverhampton Union               | G. H. Stanger                     | Feb. 27th                | xii.  |
| ow Schools, Churches                         | Trustees Bablake Boys' Charity    | Giles, Gough, and F. Pope         | do.                      | xiii. |
| excavating, Piling, &c., Foundation for Tank | do.                               | Official                          | Feb. 29th                | xii.  |
| management of Head Post Office, Newcastle    | do.                               | do.                               | do.                      | xii.  |
| construction of Bridge & Tow Path Wall       | Com. of H. M. Works               | do.                               | do.                      | xii.  |
| and Fencing, Brick Boundary Walls, &c.       | Reading Corporation               | Jas. Mansergh                     | do.                      | xii.  |
| uperintendence of House, Butter-as Park      | Plumstead Burial Board            | H. H. Church                      | Mar. 5th                 | xi.   |
| orks and Materials, Aldershot R. & Dist.     | Met. Board of Works               | do.                               | do.                      | xi.   |
| usual Repairs to Buildings and Furniture     | War Department                    | do.                               | Mar. 13th                | ii.   |
| osition Church, Rochester                    | School Bd. for London             | do.                               | Not stated.              | ii.   |
| orks and Materials, S. Wales R. & Sub Dis.   | War Department                    | W. Bassett-Smith                  | do.                      | ii.   |
| ew Military Stores, Fortisside               | War Department                    | Official                          | do.                      | ii.   |

| PUBLIC APPOINTMENT.    |                                    |         |                        |       |
|------------------------|------------------------------------|---------|------------------------|-------|
| Nature of Appointment. | By whom Advertised.                | Salary. | Applications to be in. | Page. |
| Inspector of Nuisances | St. Margaret and St. John's Vestry | £120    | Feb. 16th              | xvi.  |

| TENDERS.                                                                                                                                                                                        |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| [Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]                                                                                            |            |
| BATH.—For the erection of a stay factory, Bath, for Messrs. Chas. Bayer & Co. Mr. H. J. Garland, architect, 4, Charles-street, Bath. Quantities supplied.                                       |            |
| J. Wilkins & Son, Bristol                                                                                                                                                                       | £8,680 0 0 |
| S. Robertson, Bristol                                                                                                                                                                           | 6,376 10 0 |
| O. Wibley, Bath                                                                                                                                                                                 | 6,183 10 0 |
| C. Laver, Bath                                                                                                                                                                                  | 6,183 10 0 |
| R. Turner, Bristol                                                                                                                                                                              | 6,375 0 0  |
| W. Cowlin & Son, Bristol                                                                                                                                                                        | 5,887 0 0  |
| J. Bladwell, Bath                                                                                                                                                                               | 5,695 0 0  |
| A. Krauss, Bristol                                                                                                                                                                              | 5,600 0 0  |
| D. Mahony, Bath                                                                                                                                                                                 | 5,365 8 2  |
| J. Long & Sons, Bath                                                                                                                                                                            | 5,222 0 0  |
| * Provisionally accepted.                                                                                                                                                                       |            |
| BATH.—For rebuilding the "Hare and Hounds" Inn, on down, Bath, for the Anglo-Bavarian Brewery Company. Mr. H. J. Garland, architect and surveyor, 4, Charles-street, Bath. Quantities supplied. |            |
| Burden & Giddings                                                                                                                                                                               | £511 19 7  |
| G. Matthews                                                                                                                                                                                     | 484 16 8   |
| D. Mahony (accepted)                                                                                                                                                                            | 475 17 6   |
| [All of Bath.]                                                                                                                                                                                  |            |
| For additional Bedroom at the above.                                                                                                                                                            |            |
| D. Mahony (accepted)                                                                                                                                                                            | £50 0 0    |

|                                                                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| BRIGHTON.—For erecting new infirmaries, and enlargement of infants' wards, at Brighton Workhouse. Mr. B. H. Nunn, architect, 129, Queen's-road, Brighton:— |             |
| Card & Son, Lewes                                                                                                                                          | £23,968 0 0 |
| Lockyer, Brighton                                                                                                                                          | 21,887 0 0  |
| Peerless, Eastbourne                                                                                                                                       | 21,612 0 0  |
| Barnes, Brighton                                                                                                                                           | 21,490 0 0  |
| Stimpson, London                                                                                                                                           | 21,468 0 0  |
| Freeman, Brighton                                                                                                                                          | 21,388 0 0  |
| Garlick, London                                                                                                                                            | 21,000 0 0  |
| Chappell, Pimlico                                                                                                                                          | 20,849 0 0  |
| W. R. & Co. Light, Portsmouth                                                                                                                              | 20,793 0 0  |
| Smith & Sons, Norwood                                                                                                                                      | 20,470 0 0  |
| Sawle, Worthing                                                                                                                                            | 20,387 0 0  |
| Raunders, Brighton                                                                                                                                         | 20,344 0 0  |
| Box, Ardingly                                                                                                                                              | 20,288 0 0  |
| Descon & Co., Lower Norwood                                                                                                                                | 19,840 0 0  |
| Smith, Worthing                                                                                                                                            | 19,834 0 0  |
| Kirk & Randall, Woolwich                                                                                                                                   | 19,730 0 0  |
| Longley & Co., Crawley                                                                                                                                     | 19,650 0 0  |
| Shillito & Son, Bury St. Edmunds                                                                                                                           | 18,990 9 0  |
| Peters, Horsham                                                                                                                                            | 18,600 0 0  |
| Bisset & Sons, Sheffield                                                                                                                                   | 16,496 0 0  |

HINKLEY.—For laying oak floor and supplying oak panelling in hall at Higham Grange, for the Hon. E. H. Pierrepont.  
C. Hindley & Sons (accepted).....£163 0 0

LEICESTER.—For the following works and supply of materials, for the Corporation of Leicester. Drawings and specifications by J. Gordon, C.E., Borough Surveyor:—

|                                     |          |
|-------------------------------------|----------|
| I.—For 300 Cast-iron Tree Guards.   |          |
| Pegg & Son, Leicester               | £110 9 0 |
| Orson, Wright, & Co., South Wigston | 97 19 0  |
| Cort & Paul, Leicester              | 87 14 2  |
| W. T. Burbridge, Leicester          | 87 14 2  |
| W. Richards & Son, Leicester        | 87 10 0  |
| S. Wright, Leicester                | 84 9 2   |
| E. & G. Clarke, Leicester           | 77 0 0   |
| Goodwin & Barsby, Leicester*        | 70 7 8   |
| * Accepted.                         |          |

|                                                                     |           |
|---------------------------------------------------------------------|-----------|
| II.—East Bond-street Improvement, in front of Great Meeting Chapel. |           |
| Geo. Taylor                                                         | £296 11 6 |
| T. and H. Herbert                                                   | 259 0 0   |
| E. Fox                                                              | 253 0 0   |
| J. E. Johnson                                                       | 246 3 0   |
| W. T. Burbridge                                                     | 237 0 0   |
| J. O. Jewsbury                                                      | 228 10 0  |
| E. B. Pipes (accepted)                                              | 224 10 0  |
| [All of Leicester.]                                                 |           |

|                                    |           |
|------------------------------------|-----------|
| III.—Drainage of Cemetery.         |           |
| J. Smith, Belgrave                 | £415 16 6 |
| S. & E. Bentley, Leicester         | 399 11 10 |
| J. Evans, Leicester                | 311 5 8   |
| T. Philbrick, Leicester (accepted) | 240 0 0   |

|                                      |         |
|--------------------------------------|---------|
| IV.—12 in. Pipe Saver in Abbey Gate. |         |
| J. Dickson, St. Albans               | £78 0 0 |
| J. Smith, Belgrave                   | 65 0 0  |
| S. & E. Bentley, Leicester           | 65 0 0  |
| J. Evans, Leicester (accepted)       | 62 0 0  |

V.—Stores for the Year 1889.  
Contract No. 1.—Iron, &c.  
Vipan & Headley, Leicester (accepted) £214 16 7

Contract No. 2.—Oils, Paints, &c.  
Clark, Nettleship & Bailey, Leicester. £150 10 5  
E. H. Butler, Leicester (accepted) 128 6 9  
T. E. Butler & Son (accepted) 124 17 5

Contract No. 3.—Brushes, &c.  
Clarke's Trustees, Leicester (accepted) £273 9 0

Contract No. 4.—Timber, &c.  
E. Taylor & Sons, Thurlston .....£232 4 1½  
W. Gimson & Sons, Leicester (accepted) 194 7 11

VI.—For the Supply of Granite Kerb, Setts, Squares, Ringwall, Emmel, Gravel, &c.  
The following are the accepted tenders:—

|                                                                                                                                                                                                |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Rawson & Rawson, Enderby, near Leicester, 6,800 ft. kerb, 250 tons 3 in. by 5 in. setts, 250 tons dressed randoms, 2,000 tons 2-in. ringwall, 25 tons granite rammel, 2,000 tons screen gravel | £1,852 18 4 |
| Croft Granite Co., near Leicester, 2,000 ft. kerb                                                                                                                                              | 114 11 8    |
| Mountsorrel Granite Co., Mountsorrel, 500 ft. kerb, 2,500 tons screen gravel, 1,500 ft. grooved crossings                                                                                      | 409 9 7     |
| Grobby Granite Co., near Leicester, 250 tons 3 in. by 5 in. setts, 1,000 tons 2-in. ringwall, 250 tons granite rammel                                                                          | 535 8 4     |
| H. Hewitt, Stoney Stanton, 50 tons squares, 250 tons dressed randoms, and 1,000 tons 2-in. ringwall                                                                                            | 447 18 4    |
| Margerson & Co., Chesterfield, 100 tons 3 in. by 3 in. squares                                                                                                                                 | 100 0 0     |

VII.—For Ironwork for New Main Sewers.  
Death & Willwood, Leicester.....£332 2 0  
Gimson & Co., Leicester.....327 0 0  
Blakborough & Sons, Brighouse.....899 0 0  
A. Pegg, Leicester.....348 0 0  
Jesop & Sons, Leicester.....234 2 0  
S. Wright, Leicester.....242 0 0  
Goodwin & Barsby, Co. Leicester\*.....228 0 0  
\* Accepted.

VIII.—For Estate Fencing.  
Cunningham & Co., London.....£1,363 10 0  
J. O. Brettell, Worcester.....773 2 0  
Johnson Bros. & Co., London.....629 18 3  
E. C. & J. Keay, Birmingham.....516 1 0  
S. Wright, Leicester.....485 8 0  
W. T. Burbridge, Leicester.....442 0 0  
\* Accepted.

LONDON.—For alterations at the "Caledonian Arms," Stoke Newington, for Mr. J. B. D'Ardenne, Messrs. W. E. Williams & Son, architects, 46, Leicester-square:—  
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# The Builder.

VOL. LVI. No. 2492.

SATURDAY, FEBRUARY 16, 1899.

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## Decorative Composition.



UCH hand-books on artistic subjects as those of the series to which M. Mayeux's "Decorative Composition" belongs are so much wanted in this country, this particular subject

has been so seldom successfully treated, and the book contains so much that might be useful and suggestive to students and designers, that the faults of the English edition are a matter to be seriously regretted, especially since they are of a kind to greatly interfere with the usefulness of the work. We say the English edition, because we have not had the good fortune to see the original, and because it is apparent that the translator must be held responsible for the more serious of these faults,—namely, obscurity of language and the misuse of technical terms. For instance, a student ignorant of the meaning of the word *projection* as applied to drawing would hardly understand the following definition:—"Projection consists in determining on a plane surface the perpendiculars let down on each side of the object to be represented." Nor would he detect that the word *plan* is used *or plane* in almost all cases. He must be confused by some of the uses to which the word *section* is put, and particularly by the following definition:—"Cuts or sections are longitudinal when they run from top to bottom." Such terms as "Regence style," "space," for the ground of an ornamental pattern,— "tangential juxtapositions," and real or floriated relief of diversified direction," are enough to puzzle any one, to say nothing of an art-workman; and so is such a paragraph as the following:—

"Ornament may be accomplished: (1) by curilinear and radiating lines, divided by variously formed spaces, united either by intervening tangential lines, with or without interlacing; (2) and (3) by crossings and intersections."

It is not impossible, in most instances, with little knowledge of the subject, and by means of carefully considering the context, to

arrive at the author's meaning, but the book is written for just those who have not the necessary knowledge, and to whom it is essential that instructions should be clear. We must add that the engravings in the book, though generally to the point as illustrations of the text, are not in all cases either so well chosen or so well executed as the illustrations in English works of a similar character usually are. Having said so much, we have finished our grumble, and, leaving the garments in which M. Mayeux's ideas and instructions are clothed, will consider the substance of the book, which is by no means so open to unfavourable criticism.

The work is divided into two parts, on Theory and Practice respectively, of which the former is rather the longer, as well as the more important and interesting. It treats generally of the artistic considerations that should govern the forms of objects, of the origin of ornamental designs, and of how to compose and apply them, pointing out in each case what to aim at, what to avoid, and how to obtain particular effects, enforcing the lessons with examples and illustrations, in many cases convincing to the reader. The second part is devoted to the materials to be used, the methods of working them, the class of ornament or design suited to each, and the modifications necessary to fit it to the material. This is so large a subject that it is no wonder it is somewhat superficially dealt with in the smaller half of an octavo volume, of which a large part is taken up by illustrations. It is less interesting than the abstract theory of artistic composition, because it is based on facts and experience and common sense, and does not draw the reader into any mental controversy or speculation.

That it is possible to write attractively and, to some extent, to argue convincingly about taste and beauty has been proved in our own country by Mr. Lewis F. Day, among others, but that it is a difficult matter is sufficiently shown by the small number of books on the subject that are brought out, and the large proportion of failures among them. All artistic questions are, in fact, difficult to argue about. Art appeals to the emotional part of a man, and not to his reason; and reason, at most, has little, and more often nothing, to do with his taste. Sometimes they are found agreeing, and then the most is made of it, and we try to believe that one influences the other. Sometimes reason succeeds in convincing us that we ought to like and dislike certain things, and we

have such a virtuous desire to be guided by reason that we end in believing we like and dislike accordingly.

But, in a general way, we must accept beauty as such without attempting to argue about or discover its sources, and anyone who talks or writes on the subject is wise if he takes refuge in illustration and dogmatism, as does M. Mayeux. Among the most interesting sections in the theoretical part of the book are those on "the sources of ornament," among which nature of course has the first place. The remarks on nature as an inexhaustible storehouse of ideas and devices remind one of the well-known passage in Mr. Ruskin's "Two Paths," where he says to the architect:—

"Is there anything within the range of sight or conception which may not be of use to you, or in which your interest may not be excited with advantage to your art? From visions of angels down to the least important gesture of a child at play, whatever may be conceived of divine or beheld of human, may be dared or adopted by you. Throughout the kingdom of animal life no creature is so vast or so minute that you cannot deal with it or bring it into service. The lion and the crocodile will crouch about your shafts; the moth and the bee will sun themselves on your flowers; for you the fawn will leap, for you the snail be slow; for you the dove smooth her bosom, and the hawk spread her wings toward the south. All the wide world of vegetation blooms and bends for you; the leaves tremble that you may bid them be still under the marble snow; the thorn and the thistle, which the earth casts forth as evil, are to you the kindest servants; no dying petal nor drooping tendril is so feeble as to have no help for you; no robed pride of blossom so kingly but it will lay aside its purple to receive at your hands the pale immortality. Is there anything in common life too mean,—in common things too trivial,—to be ennobled by your touch?"

The passage has been often quoted in times past, but is worth quoting again, since it directs the student, in stirring language, to the most fertile source of inspiration for all artists. M. Mayeux gives, as other sources, geometrical figures and the works of man,—or, as he calls them, invented or manufactured objects.

He divides ornament into three classes, that in which natural or other objects are chosen, and arranged by the artist and copied directly, that in which objects so treated are introduced together with conventionalised forms, and ornament that is wholly conventional. We are inclined to think that selection and arrangement alone, unless it is of a very special kind, does not entitle a work of art to be called decorative at all.

\* "A Manual of Decorative Composition, for Designers, Decorators, Architects, and Industrial Artists." By Henri Mayeux, Architect to the French Government, and Professor of Decorative Art in the Municipal Schools of Paris. Translated by J. Gonino. London: J. S. Virtue & Co. (Limited).



Some amount of conventionality is always requisite to secure the subordination of the decoration to the object decorated, for the sake of which it exists. In a picture it means some abandonment of perspective and shading, and in sculpture generally low relief, which is the same in effect as the abandonment of perspective. Such omissions are, in fact, conventions, and conventionality thus becomes the badge of true decorative work until, by a natural extension of the idea, we come to consider a work or a form decorative in direct proportion to its conventionality. This has probably a good deal to do with the conclusion at which M. Mayeux has arrived, and at which most artists, who think the matter out, arrive, that decoration which is entirely conventional is, on the whole, the most artistic and satisfactory.

On the difficult problem of how to conventionalise we do not get much light. The student is advised to use his brush and pencil constantly in actual copying from nature, to exercise himself in simplifying the forms and colours he finds in his sketch-book, and to strive hard to discover the characteristic tints and outlines of each object. Exceptional and abnormal elements are to be rigorously discarded, and not studied on account of their oddity or originality.

In connexion with the intricate Moorish and Arabesques, based on geometrical figures, M. Mayeux notes,—besides the influence of their religion, which forbade to the artists the representation of natural objects,—the curious attraction exercised by the mixture of intricacy and order, and the high place held by geometry among the scholars of those nations, and in the middle ages generally.

The necessity is very strongly insisted upon that in all compositions something should be dominant; in the outline of a moulding, a vase, a cup, or a piece of furniture, one member must be conspicuously larger and more important than the rest. In the façade of a building one story must be the highest. In spacing out a surface for painting, one space must be decidedly the amplest. An excess of rounded forms and curved lines is shown to produce weak, and the reverse hard effects, and a well-considered mingling of the two is recommended, one or the other being predominant as grace or strength is desired.

The following pieces of advice seem at first a little unnecessary,—“Squares should have all their sides of *exactly* the same dimension, and their angles right angles . . . . . and circles should not be given more than one centre”; but what is intended is, apparently, that decision is required and that a form must be immediately recognisable as either a square or a parallelogram, a circle or an ellipse, or whatever it really is, and that if the eye is left for a moment in doubt it will not be so well satisfied. In another part of the book the superiority of a parallelogram over a square as a decorative form is noted; a parallelogram having, it is pointed out, a decided vertical or horizontal expression, whereas a square can have neither.

An important section of the book is devoted to stability, balance, and the proper distribution of masses, and the unpleasant impression produced unless there is evident as well as real stability. In connexion with this subject one is tempted to enlarge a little upon what M. Mayeux says about the difficulty of treating objects which are triangular in plan, which demand, as a rule, he says, a device in relief on each side, opposite the angles. This expedient, however apparently obvious at first sight, is not, in fact, effectual. The comparative instability, which is real as well as apparent, arises from the fact that the axis of the object, passing through its centre of gravity, falls so much nearer to the sides of the triangle than it does to the points. The application of relief ornament, therefore, in fact tends, by its projection, to add to the apparent instability. A better example is set in the delicately-designed bases of certain Roman candelabra which are tri-

angular in plan. In these objects the lack of balance inherent in the plan chosen is counterbalanced by an excess of stability in other ways, by battering the sides, and by adding great claw feet to the angles and so extending the base. Symmetry, M. Mayeux points out, is essential to dignity as well as to simplicity, which is to be sought by avoiding the multiplication of forms and ideas. Details should be increased

on the more important parts, and contrasted with plain surfaces. The leading lines of decoration are to follow those of the object decorated, so as to emphasise, and not tend to obliterate, them. Thus, a band or ornament across a disc is wrong; the ornament must follow the circular form, or radiate from the centre. A decorator, in setting-out his work, is advised to order his division of surfaces so that the largest are given to the largest part of the object. Thus, if a vase or cup is to be ornamented in bands, the broadest band must be on the thickest part of the object; if a tapering sword-sheath is to be divided into lengths, the lengths towards the point must be shorter, and those near the hilt longer. A short, and not very comprehensive, notice is taken of the effects of optical illusion, and a very interesting section is devoted to the question of scale. Art, M. Mayeux remarks pointedly, if not very originally, is created by man and for man, and he draws the lesson that man's stature must determine the size and form of objects for his use and the power of his eyesight, the scale of decoration for his enjoyment. As doors he cannot enter, steps he cannot mount, chairs he cannot sit in, are monstrosities, so ornament that he cannot see in its perfection is absurd. The minute detail that is examined with interest and admiration in a bracelet or a necklet becomes a mere incomprehensible muddle in the cornice of a room. If the traceried parapet on a church-tower were to change positions with the delicate carving in the porch, it would be equally lost, for the whole design could not be seen at once; and, if it were so, it would appear coarse and uninteresting. This principle of adapting the scale of ornament to its position ought, it is insisted, to be constantly kept in view and applied without hesitation; the ornament on a dessert-plate, even, is to be different in scale to that on a similar plate destined to hang on the wall. Yet,—and this is equally insisted on,—it is not permissible to enlarge or diminish a form or a device to suit it to different positions; such a proceeding results in a total loss of scale, and the falsifying of the perspective. The right course is to add or omit detail to the device as the distance from the spectator is diminished or increased. In decorating different parts of the same large object, this is often preferable even to changing the design, which is apt to destroy the simplicity and unity of the whole.

M. Mayeux has a good deal to say about variety, repetition, and contrast, the amount of licence that may be allowed in dealing with grotesque and imaginary forms and compositions, and the important subject of the human form in decoration. On these and other matters his theories and advice, though seldom new, are generally thoroughly sound, and are well supported by illustrations drawn from a large variety of examples of art workmanship, from architecture downwards. He does not always say all that might be said, but the space at his disposal was limited, and if he had to make a selection we do not know that on the whole he could have made a much better one. So many of the theories on subjects connected with decorative composition are still matter for debate, that it is something to have composed a work that avoids these. He occasionally falls into the vague, high-sounding generalities which too often form the whole stock-in-trade of writers and lecturers upon art; but, on the whole, his instructions, apart from the language in which they are expressed, are singularly clear and precise, and such as can be understood and acted upon without further elucidation.

He is particularly severe in his treatment of such “works of art” as carved chairs that bruise the back of any one rash enough to sit upon them, and spiky jewels that tears the clothes and flesh of the wearer. We do not agree with his not very discriminating admiration for the Albert Hall “as the outcome of intimate knowledge and illustration of all styles, both ancient and mediæval; but yet displaying the vigorous originality of its creator”; but Frenchmen are not great travellers, and possibly he has never seen the object of his admiration. Taken as a whole, however, M. Mayeux's “Decorative Composition” is to be trusted as a guide, and many art students will find it worth their while to expend the patient labour required to crack the rather hard shell of language in which the kernel of the matter is encased.

#### LONDON WATER SUPPLY.

THE book published under this title is a compilation of facts derived from information supplied by the waterworks companies, extremely valuable to those interested in the condition, history, and prospects of the Metropolitan water supply, and useful generally as showing what can be done with a source of supply part of which is not very pure,—rather to the contrary. It is one of the wonders of London that the water supply is so good as it is, both in quantity and clearness, seeing that the chief source is the Thames. This satisfactory result is only accomplished by most excellent system of filtration. The author,—for although the late Sir Francis Bolton, Water Examiner in the metropolis, collected most of the facts upon which the treatise is founded, we must consider Mr. Scratchley to be the author,—defines not only the area of the filter-beds of the London waterworks, which is a large one in the aggregate, but describes how it is that a bed of sand a few feet in thickness can exercise such a purifying influence on Thames water. It would not, perhaps, be difficult to trace back to its origin the reasoning which the author sets forth in this respect; but as he does not name any one in particular having first stated these reasons, neither shall we. They are, however, these:—“The process of filtration may be said to be both chemical and mechanical, especially the case of large filter-beds, for a process of chemical decomposition goes on simultaneously with the merely mechanical process of straining. Decaying organic substances poured into the water into a filter-bed are not merely arrested, but are rapidly decomposed and resolved into their elementary constituents, which, again, are promptly recombined into other forms. This chemical change is scientifically explained by the theory that every particle of sand is closely enveloped in a film of condensed air, and that the particles of organic matter, being thus brought into contact with a body of oxygen, undergo rapid decomposition. It is well known that all solid bodies attract about them an atmosphere of film, and, therefore, as a bed of sand and gravel is an agglomeration of minute storages each with its coating of compressed air, in other words, compressed oxygen and nitrogen, the water filtering through the interstices has to pass through a concentrated body of oxygen capable of rapidly decomposing, and forming other compounds. Consequently, if we take the case of a decayed leaf, for example, we can see that it would be resolved to some extent into carbon, nitrogen, and hydrogen, which, recombining with oxygen, form carbonic acid gas, ammonia, and water. As the result of this chemical process, the polluting vegetable matter will have actually vanished, and the water from the filter-bed has really abstracted from the percolating water, the bed it will show no trace of it.” The success of a filter-bed, however, depends a good

\*London Water Supply. New edition. By Philip Scratchley, M.A., Barrister-at-Law, Assoc. Inst. C.E. London: William Clowes & Sons, 1888.



upon the previous subsidence of the greater part of the mud in separate reservoirs. Even when this is done the deposit of mud on the surface of the top sand makes it necessary to remove it frequently and to keep a clean and free surface, rather than to force the water through by the pressure of a head which would otherwise accumulate when the full supply might be passing through the filter-bed. For the ordinary conditions of the water of the Thames and Lea after subsidence in reservoirs, the area of filtering surfaces is required to be extended, so that not more than about 540 gallons pass through each square yard in twenty-four hours. That, at least, is said by the author to be a standard rate of flow, but 6 in. in depth per hour used to be allowed, which is 675 gallons in twenty-four hours, per square yard; or per square foot,  $2\frac{1}{2}$  gallons per hour in the first of these cases, and  $3\frac{1}{4}$  in the second. The actual rate of filtration per square foot per hour is stated by the author to be, for the seven river companies,  $1\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $2\frac{1}{2}$ , and  $1\frac{1}{2}$ , but it does not appear how these rates have been arrived at, and it may have been by dividing the quantity of water supplied by the total filtering area of each company, whereas the greater rate we have mentioned is that through the area actually in use at one time. The total area is always divided into several separate beds, one or more of which is disused from time to time for removing the accumulation of mud from the surface of the sand. However, in either case it is shown to be a slow process, and in that probably consists one of the conditions which make the filtration of the London water so effectual. Anyone who remembers the old Chelsea waterworks at Thames Bank, opposite Battersea, and, after seeing the muddy banks and turbid water of the river, has gone within the "works," and asked to see the water then coming from the filter beds, must remember to have been astonished at the result, for water drawn from the filtered-water well or basin was as bright as any spring water: and the success of this system of filtration was first shown at that place, and it was due to the change of method of passing the water through the filtering materials. It had previously been the custom to pass the water upwards; but the downward direction was adopted at Chelsea, and has since always been adopted, unless it be for small quantities and exceptional cases.

The filter-beds of the London companies consist of sand, from 2 ft. to 4 ft. in depth, being that in each case found to give the best results, according to the quality of the water passed through, and other circumstances. This is supported by a thin layer of coarse sand, which is again supported by sand coarser still, or by shells, and by gravel under these, in layers gradually increasing in size of material to that of large gravel stones in the bottom, in which perforated culverts are laid to carry away the water to the filtered-water tank or well. There are eight London waterworks companies, each having its own district, deriving their water from four chief sources, viz., the river Thames, the river Lea, springs in Hertfordshire, and twenty-five deep wells sunk into the chalk, of which fifteen are in the north of London and 10 in the south. The quantity taken from these sources for domestic supply is—or was in the early part of 1888—as follows:—

|                        | Gallons per day. |
|------------------------|------------------|
| From the Thames.....   | 76,331,090       |
| " Lea .....            | 58,492,974       |
| " Springs and wells... | 19,200,056       |
|                        | 154,024,120      |

to which may be added the small quantity of 1,194 gallons per day from the Hampstead and Highgate Ponds, which is used for non-domestic purposes, giving a mean average total of 164,025,254 gallons per day, for a population of 5,446,579. The quantity supplied is, therefore, 28.37 gallons per head per day for all purposes, including the water used in the extinction of fires. The total number of houses supplied at the

same date (1888) was 734,406, being at the average rate of 210 gallons per house per day. This water, as it comes from the companies' works, is perfectly fit for drinking, but its quality when drunk by a consumer may not be so. The house cistern into which it is intermittently supplied is often neglected and dirty. A constant supply has been of late years called for, by which the water should be drawn direct from the companies' pipes in the street; and about one-half of the number of houses,—or rather more, 382,214,—have now a constant supply. The system was for a long time objected to by the waterworks companies, not so much from any motive of their own, as because the house-fittings which had been provided for the intermittent supply were not of the perfect character required for a constant supply; but these being made good, so that no very excessive waste may occur through defective house-pipes, the companies are gradually giving a more extended supply without the intervention of storage cisterns in houses. Where that has not yet been done, the author calls the attention of householders to the necessity of each one for himself seeing that storage cisterns are kept clean, and that the overflow- or waste-pipe does not communicate directly with the house-drain. Contamination of water from gases generated by sewage, the author says, is of far more frequent occurrence than is generally understood. Waste-pipes from cisterns are still to be found which are in direct communication with drains, so that gases may flow back into the cistern and become absorbed by the water. To prevent this an overflow pipe should be brought outside each house, and the end left exposed to the air, instead of being carried into a drain, as is often the case. By the adoption of this plan the poisonous effluvia and gases from drains will be got rid of, which would otherwise ascend through the pipe, and not only be partly absorbed by the water in the cistern, but be partly mixed with the air in the house, thereby becoming a cause of fever and disease.

The proper definition of the eight London waterworks companies is as follows:—The Governor and Company of the New River brought from Chadwell and Amwell to London, commonly called the New River Company; the East London Waterworks; the Southwark and Vauxhall Water Company; the Company of Proprietors of the West Middlesex Waterworks; the Company of Proprietors of the Lambeth Waterworks; the Governor and Company of Chelsea Waterworks; the Grand Junction Waterworks Company; the Company of Proprietors of the Kent Waterworks.

The proportions of the quantities of water taken from the several sources are:—

|                           |                           |
|---------------------------|---------------------------|
| From the Thames...        | 49.56 parts of the whole. |
| " the Lea .....           | 37.98 " "                 |
| " Springs and wells ..... | 12.46 " "                 |

The book before us is full of detailed information, only a small part of which our space has enabled us to touch upon; and, coming from a lawyer, we have the law relating to waterworks companies fully set forth, and cases cited which have been determined by the judges, including the recently vexed question of annual value of houses supplied with water by the London companies.

**The Registration of Plumbers.**—The movement for the examination and registration of plumbers has spread to Ireland, and a largely-attended public meeting has just been held in Dublin to explain the objects sought to be attained, and the method of attaining them. The Lord Mayor of Dublin presided, and there were present Mr. W. R. E. Coles, Sir Charles Cameron, Mr. Spencer Hartly (Borough Surveyor), Mr. W. K. Parry, C.E., Mr. John L. Robinson, A.R.H.A., and other gentlemen, who all promised to do their best to aid the Plumbers' Company in extending this useful work to Ireland. As is reported under the head of "Architectural Societies" in our present issue, a resolution in support of the movement has been passed by the Council of the Royal Institute of the Architects of Ireland.

## NOTES.

**THE** recommendation of the Council of the Royal Institute of British Architects that the Gold Medal should be presented this year to Sir Charles Newton, is a choice which ought to give satisfaction to every one. It has been the recognised custom (though it is not an official rule) that the Gold Medal should be offered, by a triennial rotation, to an English architect, a foreign architect, and to some one who, not being an architect, had done services to art and archaeology. It would be difficult to find any one coming more fully under the latter definition than Sir Charles Newton. His discovery of the Mausoleum was one of the most important archaeological successes of modern times, and one which was of interest to architects above all others.

**SIR RICHARD TEMPLE'S** paper at the Institute of Architects, of which the brief *résumé* officially issued by the Institute appears in another column, though it can hardly be said to have given any new information, was an eloquent demonstration as to the interest and beauty of Indian architecture, and is in another sense gratifying as proving that the cares incident to the exercise of important functions in connexion with political administration need not render any one blind to, or forgetful of, the beauties of Art and Nature. Sir Richard's own portfolios of sketches in India and elsewhere, which we had the pleasure of inspecting, give practical proof of his artistic feeling, and exhibit a great amount of sketching to have been got through by a man with so many other demands on his time. The architectural subjects are not, it is true, the best portion of them, though they succeed in indicating effectively the general character of the buildings represented. Many of the sketches of landscape in the collection, all quickly done, in a broad sketchy manner and without attempt at finish, are nevertheless exceedingly effective, and form an interesting series of illustrations of Indian scenery.

**IN** addition to the names which we gave in a former note (p. 28 *ante*) of English architects and others who have been invited to become members of the "Comité du Patronage" of the International Architectural Congress, to be held at Paris this year, we are informed that the following gentlemen have also been invited to join the Committee:—Mr. F. C. Penrose, Mr. E. Armitage, R.A., Mr. H. L. Florence, and Sir Richard Wallace, who is an Honorary Associate of the Institute of British Architects. This raises the number of English members to fifteen, all of whom are connected with the Institute of British Architects.

**MR. WILLIAM MORRIS** appears to have been talking some great nonsense to the people of Glasgow about Greek architecture, in the course of a lecture on Gothic architecture. As reported in the *Glasgow Herald*, "he pointed out how a Greek temple was clearly a deduction from a little wooden joss-house. The model was adhered to throughout the whole of the period of Greek civilisation with superstitious reverence. On this barbarous scaffolding of wooden construction the Greeks plastered all their civilised sculptured ornaments." The remark only shows Mr. Morris's ignorance of the history and aesthetics of Greek architecture. The connexion between the Doric columnar architecture and the great columnar style of Egypt is as clearly traced as possible, and the Greeks, instead of plastering sculpture "on a barbarous scaffolding," applied to that "scaffolding" the greatest refinements of detail that ever were applied to architectural design, as Mr. Morris would know if he knew anything whatever about the subject. Mr. Morris has designed a number of capital wall-papers, but he is no authority on architecture, of the history and constructive basis of which he is, like his prophet, Mr. Ruskin, palpably igno-



rant; and people who take his illogical rhapsodies as architectural criticism are following very unsafe and delusive guidance.

**T**HE time allowed the railway companies for submitting new classifications and schedules of rates has now expired. With regard to the former, it is understood that it will be uniform on all the railways, and will be very much upon the lines of the existing Railway Clearing-house classification. This has practically superseded the Acts of Parliament, as far as the classifying of different articles of commerce is concerned, for many years past, and has been growing in bulk year by year. It will still be a rather bulky affair, but has been considerably simplified. The schedules of maximum rates, however, are a very different matter, the rates per mile proposed to be charged varying even on different sections of the same line; indeed, Sir Richard Moon states in his report to the London and North-Western shareholders that for joint lines it has been found necessary to apply to the Board of Trade for an extension of time. It will be remembered that the railway companies fought very hard for the principle that the new maximum rates and charges should be equivalent to those which have already received Parliamentary sanction; and in the arrangement of the schedules this has doubtless been the main thing kept in view. But, inasmuch as these previously-authorised rates are so many and so varied, it will be very disappointing if there is not a great advance in the direction of uniformity, as one advantage confidently expected from this measure will otherwise be sought in vain. We allude, of course, to better facilities for calculating through rates. We are apt to talk and think of our railway system as a whole, losing sight of the fact that this system comprises a number of undertakings with independent and different interests; and it is this fact which confronts us now, and threatens to militate against the value of the Act. Another point of agreement, however, is "terminals." It appears to have been determined to go in for both "station" and "service" terminals,—the former to range from 6d. to 2s., and the latter from 6d. to 3s. 6d.,—varying with the size of the town and the nature of the traffic. In addition to this there will, we take it, be a further charge for cartage; and, altogether, the powers now applied for will be fully equivalent to the old ones, to say the least. Anything unreasonable in these proposals may be objected to by any person or association, and the Board of Trade will hear both sides of the question, and decide upon it. Such objections must be lodged within eight weeks after Feb. 10.

**M**R. JUSTICE KAY, in the case of *in re Faure Electric Accumulator Company*, has recently struck a blow at unsound companies which is worth notice. He has held that it is illegal for directors to pay brokers or other persons any commission on shares taken by investors who have been induced to become shareholders by such brokers. If a certain number of persons can be induced to take shares in a company, others are certain to follow their example. So a bubble company may be floated if an unscrupulous broker can be found who for a consideration will place some proportion of the shares. Unfortunately, it appears to be doubtful whether what is illegal on the part of directors, who occupy a different position to the promoters, is illegal on the part of the latter. But at any rate it is better that the public should be protected to a small extent, if they cannot be to the full.

**A**T the meeting of the Metropolitan Board of Works on the 1st inst., Mr. J. E. Wakefield, Clerk of the Board, tendered his resignation; and at the following meeting of the Board, on the 8th inst., Sir Joseph Bazalgette, the Engineer, tendered his resignation. Both officers have been forty years in the public service, under the Board and its predecessors. At the meeting of the Board to be held on Friday, the 16th inst.,

the Works and General Purposes Committee were to bring up the following recommendations:—

"That the resignation of Mr. Wakefield of the office of Clerk of the Board be accepted by the Board, as from the 25th March next, and that a retiring allowance of 666*l*. 13*s*. 4*d*. per annum, being forty-sixtieths of his salary of 1,000*l*. per annum, be granted to him; submitting form of resolution prepared by the Solicitor, and recommending the Board to pass such resolution, and to affix their Common Seal thereto."

"That the resignation of Sir J. W. Bazalgette, C.B., of the office of Engineer of the Board, be accepted as from the 25th March next, and that a retiring allowance of 1,833*l*. 6*s*. 8*d*. per annum, being forty-sixtieths of his salary of 2,000*l*. per annum, be granted to him; submitting form of resolution prepared by the Solicitor, and recommending the Board to pass such resolution, and to affix their Common Seal thereto."

However much we have felt called upon from time to time to criticise some of Sir Joseph Bazalgette's works, it is nevertheless due to him to say that by those works he has done a great deal to raise the standard of municipal engineering throughout the country. The London County Council will have to exercise great discrimination in choosing a competent successor to Sir Joseph.

**S**IMULTANEOUSLY with the publication of the article in last week's *Builder* on the question of cross-harbour communication at Glasgow, there came before public attention in the West of Scotland two entirely new conceptions, to add to the many by this time more or less conspicuously in the field. One, prepared by Mr. T. L. Watson, F.R.I.B.A., proposes a high-level roadway about three-quarters of a mile below Glasgow Bridge, with far-stretching approaches north and south on gradients never exceeding 1 in 40, and furnished on either river brink with dual east and west quay ascents at the steeper gradient of 1 in 24,—much the same as in Mr. Arrol's design, only straight. The plan is a very comprehensive one, and considerable ingenuity has been exercised on its evolution; but, like its competitors, it labours under certain serious drawbacks. The actual bridge itself would form but a comparatively small section of the work, and the cost of the whole would probably run to more than the author dreams of, and certainly to much more than the citizens of Glasgow would willingly disburse just now for the purpose, chiefly, of providing an unbroken street and tramway line between places so little connected, and partaking in so little intercourse, as Pollokshields and North-west Glasgow. Besides, a river headway limited to 70 ft. only, cannot hope to be very well received by the authorities of the Clyde Conservancy. The Thames Tower Bridge measurements are cited in support of this new Glasgow scheme; but only steamers of the smaller order of tonnage frequent the Thames above the Tower crossing; whereas, in the Glasgow case, Kingston Dock, which the largest class of sailing vessels and steamers use, lies above the line proposed. And the Tower Bridge, moreover, with less exacting calls upon it, will when required afford a headway of 135 ft., or just about double that allowed for in these latest Glasgow drawings. The second of the new schemes alluded to consists in a traffic ferry-boat of novel, not to say startling, design. By hydraulic ram power worked from within itself, and acting on a fixed purchase in the bed of the river, the vessel on arrival will rise bodily out of the water to the level of the quay, discharge there, reload, and then in like manner lower itself into the stream for recrossing. It is asserted that a vessel of a carrying capacity of 60 tons, and capable of performing this feat with unfailing ease, and as many times a day as may be required, has been designed, and can be delivered ready for work at a cost of 10,000*l*. We quote in another column the more detailed description given in the *Glasgow Herald* of Saturday last.

**I**N a recent number of the Copenhagen *National-tidende*, a correspondent (whose initials are probably those of a well-known Danish architect) throws a curious light upon

the position of architects in Denmark, and of which he bitterly complains. The writer first points out that, in consequence of the long and arduous course of study required, and the little encouragement given by the public and the Government, most modern Danish architects are contented with a superficial knowledge of their profession, and dispense with a course of study abroad which was always deemed necessary by architects of the old school. As one of the examples of the little encouragement given to architects, and the utter disregard of artistic execution, the writer states that all railway and military buildings now erected in Denmark are entrusted to railway and army engineers, who, he maintains, lack all architectural education, and whereby those buildings are, without exception, the most hideous of their kind in Europe. He further complains that the Commissioners appointed to decide upon designs in competitions for public buildings are generally composed of incompetent persons, as, for instance, in the case of the recent competition for a new Town-hall at Copenhagen, where the commission consisted of eighteen city aldermen and only four qualified architects. This system naturally also causes favouritism and jobbery. The writer further points out that in all such continental competitions the proportion has always been half experts and half non-experts. Finally, complaint is made that in most public Danish competitions, all the designs and the discussions by the juries are not made public, so that no opinion on their relative merits can be formed by any one outside. In endorsing the views of this writer, the leading Danish organ points out that in Germany architects and artists of note have agreed not to compete in any public competitions unless—1st. The deciding commission includes two-thirds of experts; 2nd. That the designs received be exhibited publicly before as well as after a decision is arrived at; 3rd. The total value of the prizes amounts to 5 per cent. of the estimated cost of the building. Danish architects are urged to come to a similar understanding.

**T**HE new Burg Theatre at Vienna appears,—after the first enthusiasm over, its magnificence having passed by,—to be a failure. The complaints of its faulty construction are manifold, but the loudest of all is that the actors cannot be heard. There seems, indeed, to be no doubt that if the old theatre was still standing, the national lyric stage would be transferred to its old home. Numerous suggestions are being made for amending the faulty construction, and hardly a day passes without some Vienna journal referring to the theatre with proposals for its re-construction &c. Naturally the storm raised against the architect, the well-known Baron von Hasenauer, has been very severe, and Vienna appears to have become divided into two camps, one of which throws the whole blame upon the architect, and the other defends him on the plea that the original plans for the theatre were prepared by the late Gottfried Semper; and it would appear that Herr Hasenauer is now anxious to assign to the former a larger share of the work than formerly. This has caused Semper's son, Professor Hans Semper, warmly to attack Baron Hasenauer, volunteering to demonstrate before a jury of architects that the faults for which the new theatre is blamed do not exist in his father's plans, but were introduced by Baron Hasenauer. This has added fresh fuel to the fire, and, judging from Austrian journals, the strife is raging more fiercely than ever. However, by way of consolation, Baron Hasenauer has been presented with a eulogistic address by a deputation of Viennese artists and architects, headed by the well-known architect, Baron Hansen, and signed by the mayor and a number of artistic celebrities.

**A**S most of our readers will already have learned from a letter from "Dr. Salvati & Co.," published in some of the daily papers, the Dean and Chapter of St. Paul's Cathedral have commissioned Messrs. Salvati to carry



ut in mosaic, in one of the spandrels under the dome, a design by Mr. G. F. Watts, R.A. The subject is a figure of St. John the Evangelist. We are glad to hear that something is at last to be done towards carrying out the great scheme, so long discussed and so much experimented upon, for the interior decoration of St. Paul's by mosaic; and though this is but a small item towards its realisation it is better than nothing, and we hope to hear of further commissions of the same kind before long. The best course now will be to proceed with the treatment of the remaining spandrels with designs of the same class, and in the same material, so as to render one portion at least of the decoration complete. There could be no fitter artist than Mr. Watts for such a work, and no better executants than Messrs. Salviati, and there is every reason to hope that the new mosaic painting will be a success. The practical carrying out of the work is to be under the supervision of Mr. Penrose, the architect to the Dean and Chapter.

THE *Portfolio* is publishing a series of articles on Westminster Abbey by Mr. W. J. Loftie, of which the two first have appeared in the January and February numbers. The articles are partly illustrated, in regard to some of the topographical and historical facts, by reproductions of some old prints by Hollar and others, but the most important illustrations are those drawn from the existing buildings by Mr. Herbert Raiton, who is devoting a great deal of his time at present to this work. The drawings already published include a separate page plate giving a view of the cloisters and part of the south transept, taken from the west walk of the cloister. This and the smaller sketches are, as would be expected, perfect as picturesque representations, and perhaps as precise in the indication of architectural detail as is consistent with the production of breadth of general effect. They are not precisely what architects would look for, but then the fact must be admitted that the precise indication of architectural detail which would satisfy an architect almost inevitably tends to give a hard effect to the whole as a picture, and the perspective views drawn by architectural draughtsmen seldom are pictures in the artist's sense of the word. The non-professional spectator, in fact, does not look at the detail of a building, he looks at the general effect, and no one can give this better than Mr. Raiton. Mr. Loftie appears to be going carefully into the history of the Abbey, and the whole series of articles will be a valuable possession, if they go on as they have begun.

THE collection of drawings by Mr. Paul J. Naftel, which is now on view at the Fine Art Society's rooms, includes a number of studies of scenery of the little-known island of Sark (or Serk, as it is called in the catalogue), which illustrate a very remarkable style of coast scenery. There is, we are told in the preface to the catalogue, only one landing-place at Sark practicable to the ordinary visitor, the coast consisting mainly of lofty perpendicular cliffs of very warmly-coloured red sandstone and granite; the colour effect of some of these cliff scenes, as shown in Mr. Naftel's drawings, is very remarkable, and very effective in pictorial treatment. "The Landing-place at Havre Gosselin" (16) is perhaps the most striking of the drawings showing this cliff character; another is "Creux Harbour" (48). The effect of the pale blue, clear sea under this rocky coast is finely shown in "Looking towards Port du Moulin, Serk" (14). Among drawings from other neighbourhoods than Sark is a very fine one of "Exmoor" (7); "Under the Trees, Bettws-y-Coed" (23), a study of light seen entirely through green foliage, in which colour the whole scene is steeped; "Sunset, Capel Curig" (62), an evening scene in which a great mass of rock lies alone in the middle of the picture, with a kind of uncertain suggestion of a sphinx about it; "Over the Moor, Studland, Dorset" (45), noticeable for a very fine sky; "Dungeon

Gyll" (29), a very fine little sketch; its companion, "Hell Gyll," seems a little overdone in effect of darkness. The execution of many of these drawings is of the greatest delicacy, though few of them are very highly finished in detail: there is no doubt a certain mannerism and prettiness about a good many of them,—a mannerism especially observable in the treatment of water. Mr. Naftel's strongest point is his treatment of sky; there are many fine skies among the drawings which have (what is so difficult to get in a sky) a peculiarly uncontrived appearance, as if really blown into their forms by wind rather than arranged by volition working with a brush.

JUDGING from some of the things which are hung, and even favourably hung, in the water-colour exhibition of the Dudley Gallery Art Society, it is impossible to rate the exhibition as a high-class one, but it contains more of interest than a first glance would lead one to expect. Mr. Walter Severn's large drawings are more numerous than usual; "Autumn Tints on the Clyde" (30) is a study of middle-distance woods, with rather steely, hard water in the foreground; "Loch Lomond" (117) is a fine representation of the hill ranges and the sky; but here again the water is mechanically treated, with equally-spaced ripples, as if put on according to a receipt. The same curiously inartistic treatment of water is to be seen in "Boulders in the Sound of Jura" (152), also a fine work in other respects, though the "boulders," which give the title to the work and form the prominent foreground objects, are not very exhaustively studied. "Loch An't Sitheich-Ban, Argyllshire" (172), represents, with great perfection of detail, the strange and fairy-like effect of a large expanse of water-lilies forming a complete circle or ring, with a space in the centre, on the surface of perfectly calm water. Mr. Arthur Severn contributes a curious study of "Summer Moonlight" (18), the cold light of the moon being contrasted with the lights from the windows of houses; it is a remarkable study in its way, but the fleecy moonlit clouds seem to come rather too near into the foreground, not keeping their proper distance in the picture. "Mrs. Angell's Last Picture" (179) is the title of a fine drawing of flowers, on a larger and bolder scale than that accomplished artist was usually accustomed to paint. "Nature Morte" (197), a dead bird and some butterflies, by Mrs. Lukis de Guerin, reminds us of the kind of thing Mrs. Angell used to do so well, and is an excellent piece of work. Among representations of still life may also be mentioned Mr. Block's paintings of old books (6, 217, 240), of which the two first in the numbering are admirable; No. 240 is not so successful as the others. Among the attractions of the collection are Mr. F. G. Coleridge's small and delicately-finished scenes on the Thames—"The Thames at Bisham" (157), "At Sonning Lock" (178), &c., which have also the merit of being very faithful representations of the scenes. The architectural subjects by Signor Giam-pietri, "Chalet Speicher, Lucerne" (15), and "The Arch of Septimius Severus" (63), are remarkable examples of powerful representation of light and colour on buildings, the latter especially, which architects should look at. Mr. Hubert Medleycott contributes two London views from the Thames, which are good in general, but in both cases he has shown that he (like a good many other artists) cannot draw the lines of a circular building in true perspective; his St. Paul's dome,—or, rather, the sub-structure of the dome,—is so crippled in line as to be painful to the eye. Various small drawings by Mr. G. Marks (102, 170, 179, 198) should be looked at; they are all fine examples, on a small scale, of artistic feeling and composition in landscape. Mr. W. Lloyd's "In the Woods" (145) shows two figures of a girl and child treated with great force and character; an admirable little work. The exhibition contains various rather rough and hasty sketches of landscapes, which, as such, are powerful and effective, such as "Showery

Weather (a Langham sketch)" (111), by Mr. Rupert Stevens; "The End of the Crag" (71), Miss Skidmore; "A Peep at Cheviot" (155), by the same artist. Mr. Reginald Barber's two life-size studies of quarter-length figures (167 and 193) are fine in character and colour. Among others to be particularly noticed are the "Old Swan Tavern, Battersea," Miss Kate Macaulay (36); "Coming into Port" (58), by Mr. David Green, a large drawing of a tug steamer and ship coming bow-on to the spectator; "Poole Quay" (101), by Miss Bernard; "Reflections" and "Industry" (112), two studies of old women, by Mr. Henry Terry; "Where Eagles Were" (138), a fine study of mountain and mist, by Miss Alice Morgan; "Clearing the Pier" and "Through the Foam" (169, 189), two clever sea studies, by Miss Helen O'Hara; "Valle Crucis" (196), a large landscape, by Mr. R. A. K. Marshall, and another in the same neighbourhood (207), by the same artist; "Corisande's Garden" (211), by Miss Rose Barton; "A Stormy Evening on a Tyrolean Pass" (218), by Mr. B. J. M. Donne; and "Last Rays on Ben Nevis" (261), by Mr. W. J. Fergusson.

THE current number of *Harper's Magazine* gives, as an excerpt from the "Editor's Drawer," an architectural criticism which is smartly put, and of pretty wide application. A visitor who had been driving through some of the country towns of New York State observed that he did not object to a house that was consistently "Queen Anne" throughout, but he did object strongly to those,—and their name was legion,—"which were Queen Anne in front and Mary Anne at the back."

THE following verse is said to have been found on a piece of paper picked up the other day on the floor of St. Alban's Cathedral. The lines appear to have reference to the carving on the spandrels of the West doorway:—

"Said the Builder who builded the great West door,  
"What shall I put in the spandrels four?"  
Then answered the Architect thus, quoth he:  
"Put St. Mark, and St. Luke, and St. John, and ME!"

#### THE THERMÆ OF CARACALLA\* (Continued).

BY PROFESSOR AITCHISON, A.R.A.

In my last lecture I was obliged to leave off completing the account of Caracalla's baths, and I will now continue it.

I have taken extreme pains to find out the exact use of each room or hall, and being not only a frequenter of Turkish baths in all the countries I have visited, and having built one in London, but being also acquainted with gymnasiums and Schools of Arms, and with the passages about exercises, baths, and bathing in the Latin authors, I felt quite sure I should be able to give you a complete account; but, unfortunately, I am obliged to make the same confession as Bertotti Scamozzi in the last century, that the pains I have taken were not crowned with success. This is not to be wondered at, when we have no treatise on the subject, for from the Romans exercising and bathing every day, there was no occasion for an author to enlarge on what everyone knew, and the casual hints dropped by poets and writers will not piece together to make a perfect whole. I regret this because a plan loses half its value as a means of instruction, when we know little more about it than that it looks well on paper.

Every person who could afford to keep a slave took one with him to the baths, and the more opulent often took many. Pliny the younger tells this story of that Macedo, who was eventually murdered by his slaves in his own bath, and of whom I spoke in my last lecture, that he was once in a public bath in Rome, and his slave, in order to make way for him, "laid his hand gently upon a Roman knight, who, suddenly turning round, by mistake gave Macedo so violent a blow that he almost knocked him down;" and everyone knows this story of the Emperor Hadrian, who found one

\* Being the third Royal Academy Lecture on Architecture this Session. Delivered to the students of the Academy on the 4th inst. (For the previous lectures see *Builder* pp. 85, 103, ante.)



of his veterans rubbing himself against the wall or the edge of the bath. On the Emperor asking the reason, he was told the soldier had no slave to strigil him, and was given one by Hadrian. The next day the bath was full of old soldiers rubbing themselves against the walls, and he then advised them to strigil one another. It is possible that the rooms at the end of each vestibule were the waiting-rooms for the private slaves in attendance on their masters.

The two rooms at the end of the tepidarium may have been used for the strigiling, shaving, shampooing, plucking, singeing, nail cutting, pumicing, and perfuming the bathers; else they must have had these offices performed for them in the bathing-rooms, though I confess it would have been awkward in these rooms, as there is no other way of getting into the tepidarium except through the laconicum, unless it could be entered from the swimming-bath. It is, perhaps, more probable that they were used for cooling or waiting rooms when the bathers were dressed.

All the rooms of the central building were lit by vast segmental windows high up, the large warm-room, tepidarium, having two tiers of windows or openings, the lower ones to the east into the swimming-bath, and those to the west into furnace courts and the upper tier in the clear storey, and the heat was retained by glass in bronze lattices.

The bulk of the roofs were terraced and covered with black mosaic, with figures, dolphins, &c., merely outlined and etched in white.

A curious thing is to be remarked here—that

All the rooms had hanging floors for warmth, including the cloisters of the gymnasia, but these hanging floors did not extend to the open areas of the peristyles, nor to the swimming-bath, that is said to be lined with white marble, but has now a modern mosaic floor.

Most of the rooms have no structural columns, only screens of columns, and are vaulted with quadripartite vaulting, except in the case of the cloisters to the gymnasia, the columns there carried one-half of the semi-circular vaults. The rooms called by Blouet *celle, tepidaria, and frigidaria*, at the back front, have semi-circular vaults, in the former case the vault possibly groins with the head of the segment.

I will just glance at the grand tepidarium, 180 ft. long, 79 ft. wide, with a room at each end of the same width, and 59 ft. long, screened off by columns. The tepidarium is 108 ft. high to the crown of the vault; it has four segmental apses 33 ft. wide, each containing a bath lined with white marble, and square-ended transepts 48 ft. wide. We must go to the nave at York to exceed its length and compare with its height; and to the nave of St. Peter's at Rome to exceed its width and height. The nave of York is said to be 205 ft. long, and 93 ft. high; the nave of St. Peter's to be 288 ft. long, 88 ft. wide, and 150 ft. high.

I here give you a list of London, English, and foreign halls, both vaulted and unvaulted. You observe that it is wider and higher than any of the English vaulted halls given, 10 ft. longer than St. George's Hall, and 50 ft. less than that of the Law Courts:—

|                                                     | Length. | Width.       | Height.     | Authority.                  | Remarks.                                                                                                |
|-----------------------------------------------------|---------|--------------|-------------|-----------------------------|---------------------------------------------------------------------------------------------------------|
|                                                     | ft.     | ft.          | ft.         |                             |                                                                                                         |
| <i>Vaulted Halls in London:</i>                     |         |              |             |                             |                                                                                                         |
| The Law Courts .....                                | 230     | 48           | 80          | <i>The Builder</i> .....    | { Stone. By G. E. Street, R.A.                                                                          |
| Central Hall, Natural History Museum .....          | 115     | 50           | 72          | <i>The Guide-book</i> ..... | { Ribs of iron. By Mr. A. Waterhouse, R.A.                                                              |
| <i>Vaulted Halls in England:</i>                    |         |              |             |                             |                                                                                                         |
| St. George's Hall, Liverpool...                     | 170     | 74           | 82          | Lord Grimthorpe.            | { Vaulted, with a semi-circular vault of hollow bricks. By Elmes, and finished by Prof. Cockerell, R.A. |
| <i>Vaulted Halls, Abroad:</i>                       |         |              |             |                             |                                                                                                         |
| Salle des Pas Perdus, Palais de Justice, Paris..... | 216     | 84           | 60          | .....                       | { Stone. Has a row of columns down the centre. By J. L. Duc.                                            |
| <i>Halls in London (not vaulted):</i>               |         |              |             |                             |                                                                                                         |
| King's Library, British Museum .....                | 305     | 40           | 90          | <i>The Guide.</i>           |                                                                                                         |
| Westminster Hall .....                              | 258     | 68           | 90          | Lord Grimthorpe.            |                                                                                                         |
| Guildhall .....                                     | 153     | 50           | 60          |                             |                                                                                                         |
| St. James's Hall .....                              | 140     | 60           | 60          | Ld. Grimthorpe (?)          | Built by Owen Jones.                                                                                    |
| Venetian Room, National Gallery .....               | 120     | 40           | 47          | G. Aitchison.               |                                                                                                         |
| Middle Temple Hall .....                            | 100     | 42           | 50          | Lord Grimthorpe.            | { Rebuilt in imitation of old one by Wren.                                                              |
| Lambeth Palace Hall .....                           | 93      | 38           | 50          | R. Norman Shaw, R.A.        | By Sydney Smirke, R.A.                                                                                  |
| Large Room, Royal Academy .....                     | 82      | 42           | 50          |                             |                                                                                                         |
| <i>Halls in England (not vaulted):</i>              |         |              |             |                             |                                                                                                         |
| Christ Church Hall, Oxford...                       | 115     | 40           | 50          | Lord Grimthorpe.            |                                                                                                         |
| Hampton Court Palace Hall...                        | 106     | 40           | 45          | Lord Grimthorpe.            |                                                                                                         |
| <i>Halls Abroad (not vaulted):</i>                  |         |              |             |                             |                                                                                                         |
| Great Hall of the Palazzo Regione, Padua .....      | 261     | 85           | 80 (about.) | G. Aitchison.               |                                                                                                         |
| Golden Hall, Augsburg, Bavaria .....                | 110     | 58           | 52          |                             |                                                                                                         |
| La Lonja, Barcelona (The Exchange) .....            | 120     | 70           | ...         | G. Aitchison .....          | { Divided into three equal aisles by stone columns and arches, but with a wooden roof.                  |
| <i>Ancient Roman Vaulted Hall:</i>                  |         |              |             |                             |                                                                                                         |
| Nave of the Basilica of Maxentius .....             | 295     | ft. in. 80 6 | 116         | Palladio .....              | { Span of three arches of aisles, about 71 ft. each.                                                    |

though the terraced roofs were covered with storied mosaic pavements, and therefore it may be presumed were meant to be walked on and admired, yet there seem to have been no staircases that could be dignified with the name of grand. Four of the staircases are only good-sized tower staircases, two entered from the rooms at the back of the entrance vestibules, which we suppose were the slaves' waiting-rooms, and two from the furnace courts in the piers adjoining the laconicum. The other two staircases in the small chambers of the apodyteria are but 3 ft. 10 in. wide, yet we must believe that, in fine weather at least, the terraces over the cloisters of the gymnasia were filled with people when the exercises were going on.

The vaulting of the tepidarium at Caracalla's baths was groined, in what is called quadripartite vaulting. The vault itself was, according to Palladio, 6 ft. 10½ in. thick; it rested on the white marble entablatures of the eight monolithic columns, which were of Egyptian granite, and, according to Blouet, of Oriental alabaster and Numidian marble (Giallo antico), about 4 ft. 11 in. in diameter, with the bases, composite capitals, and entablatures of white marble. The entablatures were only of the width of the columns, with the mouldings profiling round them; each entablature went into the wall at the other end, and partly acted as a corbel as well as a lintel; on these entablatures the sills of the

vault stood. The columns supporting the vaults were gradually removed. The Grand Duke of Tuscany, Cosmo dei Medici, called Cosmo I., is believed to have taken away the last one, in 1564, to put up in the square of the Santa Trinità, at Florence. It now stands on a pedestal, has a Doric capital, and supports the statue of Justice; the inscription says it was put up in 1570. I went to Florence to get the dimensions of this column, though Palladio gives its diameter as 4 ft. 6½ in., and its total height, including the base and composite capital, as 45 ft. 5 in. When there, the police would not let me have a ladder without a permit, and I had no time to get that, so I hired a little mason's lad to climb up the pedestal, and get the lower circumference of the column, and that of the fillet under the apophysis, which were respectively 15 ft. 4 in. and 16 ft. 9 in., or about 4 ft. 10½ in., and 5 ft. 3½ in. in diameter, the shaft is a monolith of grey Egyptian granite, probably from the Claudian Mount in Egypt, close by the Red Sea. I wondered whether this little bright-eyed mason's lad would turn out another Trissino to have him taught. Cosmo I. died in 1574, and Palladio in 1580, and I cannot tell you when the vault fell in, but it was in the sixteenth century; and when it fell the noise and vibration were such that the Romans thought it was an earthquake.

It is deeply to be regretted that such a hall should have been destroyed for the sake of eight columns and eight entablatures.

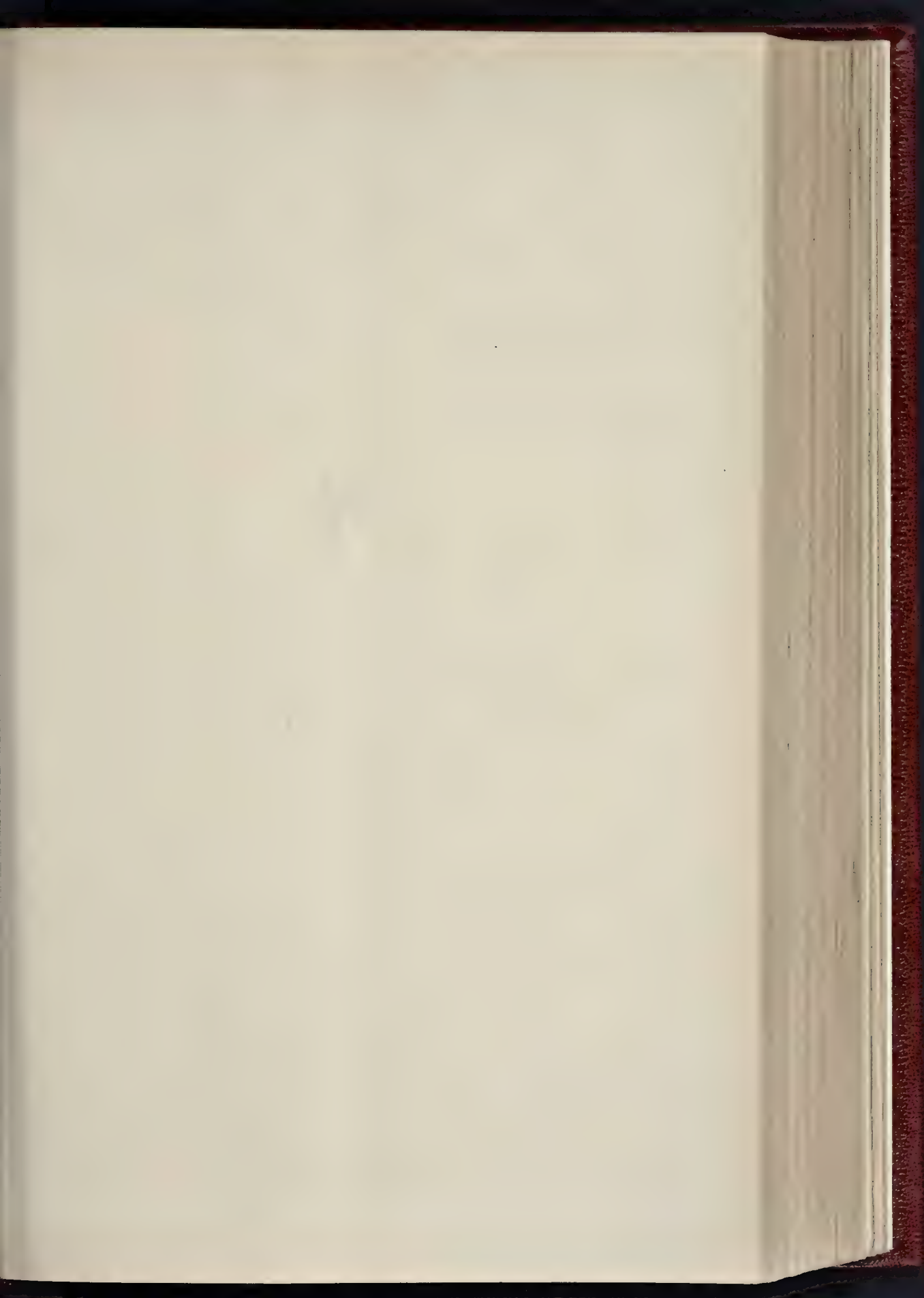
The Pantheon seems perfectly sound, though built 200 years earlier, and from the tepidarium and caldarium of Diocletian's baths being turned into a church, these parts are still standing, with the antique brazen bosses for the lamps still on the vaulting. Seeing that this vaulting is smooth, I cannot help thinking that Blouet was in error in supposing the tepidarium of Caracalla's baths was coffered after the manner of the basilica of Maxentius. Palladio published his book of architecture in 1570, and whether he had measured these ruins before the vault fell I know not; but in the facsimile of his drawings, published by Lord Burlington, he does not give the height to the crown of the vaulting of the tepidarium, though he marks the thickness of the vault itself as 6 ft., or about 6 ft. 9½ in., if he used the foot of Vicenza, as Bertotti Scamozzi believed.

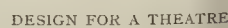
Palladio, in his book of 1570, says he used this measure only, and gives a woodcut of half-a-foot, which measures about 6½ in. English, equal to about 1:153, rather more than the usual ratio of 1:136; but though one cannot go to a woodcut for absolute accuracy, this brings the dimensions nearer to the truth. Lord Burlington, in his preface, says Palladio used three different measures, but does not name them. Bertotti Scamozzi says they were the foot, pace, and perch of Vicenza,—respectively, 12 in., 5 ft., and 6 ft.; but, as Palladio makes no mark over his dimensions, we can only guess which is which. We can see in some instances that if the dimensions given were all in the same measure, the plans could not have been drawn to scale; and, comparing Palladio's dimensions with those of Cameron and Blouet, we find this amazing discrepancy. For instance, in the distance from the back front to the palestra, Blouet gives 395 ft.; Palladio 380 ft. from the ends of the main building to the side peribolus; Cameron gives 170 ft.; Blouet 167 ft., Palladio 161 ft. This, however, is to be said, that it is most probable that the ground was not only very uneven in Palladio's time, but vast masses of the fallen parts were lying in the way, and that unless he had very elaborate appliances, nothing approaching accuracy could be got, as I found to my cost in trying to take dimensions of the laconicum.

If Caracalla's Baths were wholly built in his reign, they could but have taken something, under six years to build; our Natural History Museum took seven. It is admitted that the peribolus was finished by Hellogabalus, and that the portico was added by Severus Alexander.

When Cameron measured the ruins in the eighteenth century, and Blouet in the nineteenth, all that part of the laconicum that was above ground did not project beyond the back or S.W. front, but it turns out that the bottom of the circular wall still existed below ground. This ground was excavated by the Italian Government, and I now give you the remainder from my measurements. You see that beyond the circle of the laconicum there was a projecting apse, and within the circular wall one semi-















ular recess faced with brickwork. I cannot whether this or these existed originally, or whether they were built by Aloysius, Theodorici's architect, in 500 A.D.; but, while I was measuring a visitor found some pieces of sheet-glass in the mortar-joints. The apse was lined with the vertical flue-pipes, secured to the brick face with a sort of double-headed iron fastenings; the flue-pipes were covered with a layer of plaster, and the inside face of the plaster was lined with white marble. The thickness of plaster here was about 8 in., but other places it varies from 4 in. to more than 6 in. in front of the flue-pipes, and there is marble lining in addition. The paving of the laconicum is of marble rounds, like that of the Pantheon, and is possibly of Theodorici's. I may here mention that the circular staircase shown by Blouet in one of the piers, joined to the laconicum, is not correct; it is a square staircase, and goes up as high as the apse exists, and down into the prefrunium, in front of the hanging floor of the adjoining recess of the laconicum; this recess (given on my plan) is furnished with seats, and the marble of the seats and floor step still exist. The dome of the recess looks very like a water tank, only I did not notice an exit for the water. The court in front of the prefrunium is a sort of a vaulted passage, as far as the numbers called reservoirs extend, and beyond an open area in front of the basement vault goes under the furnace court in front of the bath reservoirs.

There is another thing I have not yet mentioned, and that is that all the structural decorations you can see in the bare brick facing are apses and niches. At this period, in fact, before the Christian era, almost all human architectural decoration was face-work, applied on, except in the case of monolithic masonry carrying vaulting. Even at the Pantheon, the external white marble casing was applied on to the brick face, though there it is in thick, and in vast slabs of pentelic marble, 11 ft. long by 3 ft. 2 in. wide. At Caracalla's bath the marble lining rarely exceeds 2 in. in thickness, and is also cramped with the brickwork. Plinths are often 7 in. or thicker. These are made up of mortar, or of facing, and the marble casing cramped on. Instead of screeds being run, bits of sawn stone were let in flush in various parts to get level surface. Instead of forming a museum spot, the Italian Government has unfortunately allowed those things that are of value, that may be injured by exposure, to be taken to the Lateran Museum,—the mosaic of the Athletes for example,—and all now speak of are such parts or pieces still remain in their original places. The marble facing is still attached to the wall of the gymnasium in a few places, and porphyry as a plinth facing, by the left-hand from the S.W. transept of the tepidarium, (Chian (African) on the plinth of the piers.

There are fragments of the red porphyry of the screens, and also fragments of columns of the tepidarium. One of grey granite had a bottom put on with a lead joint, another, that had been pieced, showed the iron or cramp-holes. In the grounds of the villa adjoining, part of which occupies the site of the end room, I picked up a few pieces of mosaic, which I now exhibit, and a bit of porphyry inlay, as well as some of both Hadrian's Villa, near Tivoli.

The columns of the tepidarium were of red grey granite, probably from Syene and the Mount in Egypt, and,—according to the rest were of Numidian marble (Sicilian), Oriental alabaster, and the screens of red porphyry, while those of the front were of red granite. The walls of the various halls and chambers, according to Blouet, were lined to the ceiling of the vaults, with green and red porphyry, green serpentine, green Chian marble (Sicilian), grey African, Numidian (Sicilian), Porta Santa, and Syennadic from Phrygia (Sicilian), Oriental alabaster, and white marble; a piece of a carved frieze in white marble is still in place on the wall of the cloisters of the gymnasium. The vaults were faced with red, painted and gilt, or covered with glass; the floors were mainly of marble.

This week's *Builder*, p. 126, has called that part of the building the "back room" from which the semicircular laconicum projects.

I have already mentioned the mosaic portraits of the Athletes that were in the colossal exedra of the gymnasium, executed in mosaic of precious marbles and fine stones. Each figure and head is surrounded by a border consisting of a guilloché in Numidian, with a green and white edging. The other mosaic pavements that remain are in patterns. Those of the open areas of the peristyles of the gymnasium consist of a wide border of floral scrolls in green porphyry on a white ground, enclosing a centre consisting of ovals in oblongs, alternately green, red, and yellow. The cloisters of the gymnasium are imbricated; the imbrications are in shape like the marble roof of the lantern of Demosthenes,—only, of course, flat. Each leaf is divided down the centre, and the two halves are of red and white, and green and yellow alternately, and the leaves run in diagonal lines.

The concamerata sudatio of the gymnasium is also imbricated in escallops of black and white in alternate lines parallel to the borders; the side walls of the ephebeum have white squares on a yellow ground, bordered with green, and containing a green circle; the halls at the back of the entrance corridor to the baths are paved with oblongs like masonry of white, grey, and yellow, with green joints; the border has green circles in white squares, with oblongs between of yellow and grey, also with green joints. The libraries have lines of lozenge-shaped shields, one yellow and two white, and *vice versa*, each shield bordered with green, and the pavements of the little double chambers on each side of the apodyteria are of black and white; one pavement has intersecting circles of white, forming black curvilinear hexagons, and the other has white lines in meanders, each line touching the other; the mosaic is formed of various-sized tesserae, some as big as 1 in. square, and some not quite  $\frac{1}{2}$  in., of white marble, green and red porphyry, giallo antico, and black lava, and mostly laid at right-angles. I mention this because, at Pompeii, the tesserae are mostly laid diagonally.

Blouet says, the external stucco of the central building was  $2\frac{1}{2}$  in. thick to the three sides, and to the back front, ornamented with mosaic, it was a trifle over 3 in. thick.

I must say a few words about the solar cell. In my last lecture I mentioned the facts I had from Professor Lanciani, but I do not think we can be content to suppose that the ceiling and roof were wholly of concrete. If it were so, besides the unpleasantness of diving into black water, and of swimming about in the dark, why was it called the solar cell? I believe it was brilliantly lit by the sun, and the edges alone being of concrete, for getting at the glass for cleaning and replacing. It is quite possible that the terrace was also used for looking over the walks and grounds. I believe the greater part of the solar cell was glazed with clear glass in bronze lattice work, for this reason,—Seneca and the younger Pliny both enlarge on the prospects from swimming baths,—Seneca to lament, and Pliny to exult in them. Seneca says:—"People now say baths are only fit for moths, when you cannot see from the bath the landscape and the sea." Pliny says, in describing his Laurentine Villa:—"Annexed to them is a warm bath of wonderful construction, in which one can swim, and take a view of the sea at the same time." Statius describes the gables of the baths of Etruscus as gleaming with coloured glass, but this perhaps was mosaic.

Perhaps I have not done right in not giving you before Vitruvius's description of the baths and palaestra; for these Thermae mainly comprise the two conjoined; but when I began I thought that, as Vitruvius's book was written before Agrippa built the first thermae, the description was not of much use; as, however, we shall pursue the study of the other thermae, it may not be too late now. To begin with what Vitruvius erroneously calls the palaestra, for it seems to have been the gymnasium, a palaestra was the professional school and exercising grounds, in contradistinction to the gymnasium, which was for the citizens' training and exercises. It is now the fashion to call them *burgesses*, and this is perhaps useful, if we use the former as the mere free dwellers in a city, and take the latter as those having the full Roman rights of a free citizen. There were Latin rights, and rights of free towns. His being a *Civis Romanus* enabled St. Paul to appeal to Caesar.

Vitruvius says (lib. v., chap. 11): "It now appears right to me to explain the buildings of the palaestra, and to show how they are arranged among the Greeks, although they

are not an Italian fashion. In palaestra square or oblong peristyles are to be so made that their circuit is equal to two stadia (the stadium being 600 Greek feet, or 606½ English), which the Greeks name *ἀσπασίον*; in which three simple porticoes are disposed; and the fourth, which is turned to the south double; so that when there are storms of wind the rain cannot get inside. (2) Spacious exedrae, with seats, are provided in the three porticoes, in which philosophers, rhetoricians, and others who delight in study may dispute sitting. In the double portico these parts are to be placed, the ephebeum in the middle: this is a spacious exedra with seats. Let it be a third part longer than it is wide; on the right the coryceum; then next it the conisterium; from this, in the turn of the portico, the cold bath which the Greeks call *λουτήριον*; to the left of the ephebeum the *ἐλεσθησιον*, next to the left of the ephebeum the *ἐλεσθησιον*, next to the left of the ephebeum the *ἐλεσθησιον*; from it is a passage to the propugnium, in the turn of the portico. Close, but towards the inside from the boundary of the frigidarium, is placed the concamerata sudatio (vaulted sweating chamber), twice as long as it is wide, which may have at the turn at one end the laconicum, and fronting the laconicum the calda lavatio (warm bath). . . . (3) Outside the peristyle three porticoes are placed, one for those going out of the peristyle, and two for races to the right and left; of which that which faces north may be made double of ample width; the others, ordinary ones, so made that the parts which are next the walls and the columns may have margins for paths not less than 10 ft. wide, the middle is to be sunk, so that there may be two steps in descent from the margins 1 ft. 6 in. to the bottom, and these bottoms to be 12 ft. wide, so that those dressed walking on the margins may not be incommoded by the greasy exercisers. (4) This portico is called *ἐσπέρδις* by the Greeks, because the athletes exercise in covered stadia in the winter. Close to the xystus and double portico are marked out the open walks, which the Greeks call *παπαπομίδας*, our people call them *xysts*, in which the athletes going out from the xystus may be exercised through the winter in fine weather." (By this you see that the Greek and Roman xysts are of opposite meaning, the Greek being covered, the Roman open.)

"The xysts are to be so made that there are trees or groves of planes between the two porticoes, and walks must be made between the trees, and shelters of signum work. Beyond the xystus the stadium is so formed that a multitude of men may without crowding behold the athletes contending." . . .

I have taken the baths second, because I described the gymnasium first in my first lecture on the thermae. This is what Vitruvius says (lib. v., cap. 10):—"First, the place to be chosen is to be the warmest, that is away from the north and the north-east wind. The caldaria and tepidaria have the light from the winter west, but if the nature of the place hinder this, from the south, because the chief time for washing is from mid-day to eve. It is to be noted that the hot rooms for men and women are to be joined and placed in the same part, so that the common cauldrons and furnace may be used for both." (I here omit the constructional details). (4) "The sizes of the baths should be in accordance with the number of bathers; the rooms should be so arranged that they may be one-third less in width than in length, exclusive of passages to the labrum and the alveus. The labrum is to be made under the light, so that those standing round may not obscure the light with their shadows. The passage round the labrum must be made wide, so that when the first have taken their places, the remaining lookers-on may be able to stand upright. The width of the alvei (floor baths) must not be less than 6 ft. between the wall and the parapet, as the seat and lower step take off 2 ft. (5) The laconicum and sweating rooms are to be joined with the tepidarium, and whatever may be their width, they are to have the same height to the springing of the hemisphere: a centre light may be left in the hemisphere, from which a brazen damper may hang with chains, by the raising and lowering of which the sweating temperature may be maintained; and it seems that it ought to be made circular, so that the force of the flame and vapor may wander by the roundness of the curve equally to the middle."

You observe that Vitruvius says nothing of a swimming-bath, of an undressing-room, nor of an oil store; whether these parts were omitted



because they were not in use or because they were too well-known to need describing I cannot say. Baths must have been plentiful in his time, or Julius Cæsar would not have left 3,000,000 lbs. weight of oil for the bathers.

I think I ought to say something about the regulation of the therma, and of those attached to them, whether they were freemen, freedmen, or slaves, so that if we ever get the plans of the basement we may know something of those who were employed, and who were likely to live there, even when lights were used; we hear of slaves being in the baths when the lights were put out (Martial, lib. 3, epig. 93, line 14). It is almost certain that the baths must have been cleaned daily after some fashion, although the story of the Consul's wife does not show that even on great occasions the ancient baths were always particularly nice. She was in the town of Teanum Sidicinum, and ordered the men to be turned out of their bath as the women's bath was too small; the Chief Magistrate was rather long in getting this done, and, in consequence of this and of her finding the bath dirty, she had him scourged with rods in the market-place. Suetonius (Suet., Titus, cap. 8) tells us of Titus bathing with the people, and I told you the story of Hadrian, so we can hardly believe the baths were very dirty. With 1,600 bathers, most of whom were covered with oil, dust, or ceroma (Mart., 11, epig. 48),—a mixture of oil, wax, and clay,—one would think every bath or labrum wanted cleaning out daily, as well as the floors and walls of the rooms. In our Turkish baths the walls are cleaned down every day from top to bottom. To do this in Caracalla's therma, containing such an immense surface of walls and floor, would have required a whole army of slaves.

As the whole system of gymnastic was taken from the Greeks, most of the names are Greek, the head of the gymnasium seems to have been the gymnasiarch, who, according to Plautus, was called the prefect of the gymnasium. There was also the xystarch, who apparently looked after the professionals.

The former seems to have had the whole control, and could discharge teachers and forbid philosophers and rhetoricians from attending, if he thought their influence was bad, especially on the boys, who, according to Plautus, went to the gymnasium before daylight. He names the exercises they learnt,—“running, wrestling, throwing the javelin and quoit, boxing, ball-playing, and dancing or jumping.” Then there was the gymnasta, who taught the exercises; the paedotriba, who was apparently an under-master; and under him was the hypopedotriba, the spheristicus, who taught the games at ball. The alipta or aliptes, the trainer who saw to the pupils' food and regimen (both professionals and amateurs ate colipia, the ingredients of which are variously described), and to their particular capability for each exercise. The alipta rubbed in the oil or ceroma for the purpose of seeing the condition of their muscles; the unctor, who merely did the ordinary greasing; and the re-unctor, who re-oiled them. There were also the cosmetes, who arranged the games, registered the names, and maintained order; he was assisted by an anti-cosmetes and two hypocosmetæ. There were sophroniste to inspire the youth with the love of wisdom and look after their morals, and they were assisted by hypo-sophroniste; and there were mediastini, or drudges, apparently the attendants; and there must have been slaves for the oil stores, dust stores, and perfume stores, possibly rubbers down, and certainly sweepers and cleaners; and, if dust was strewn, slaves to strew it and clear it away. Athens is supposed to speak of carpets being sometimes spread for wrestling, but it seems probable that some of Alexander the Great's captains had leather awnings to protect them from the sun of Persia while they were exercising. One can hardly believe the Romans would have paved places where falls were certain to occur, or where the exercises would damage the pavement, therefore the wrestling, the pancratium, the javelin throwing, quoit playing, as well as the stipes,—the stake or the palus,—the post, quaint, or wooden manikin, at which they out or thrust, must have been in the grounds.

As to the bath slaves, there was the balneator, or bath-keeper, did he take the money? From the story of Hadrian and the veteran, it was evidently not the ordinary duty of the bath-servants to strip, though probably there were slaves to do all these offices required on pay-

ment, for those visitors who had not slaves of their own. Sponges, both red and white, were used, and linen towels, as well as the soft woollen ones which Trimalchio used. (Pet., Satyricon, cap. 28.)

There was the—  
Unctor—who oiled the bathers on entering.  
Re-unctor—who re-oiled during the bathing, or performed them on completing the bath.  
(Until the discovery of alcohol, all scents were retained by oil or grease.)

Tonsor—the barber and hairdresser.

Alipilus—the plucker, who pulled out the hair from the body with pitch, resin, or tweezers, used depilatories, or burnt them off with nut-shells, though these last were usually called ustriculae.

Tractator—shampooer.

Caparius—caretaker of the clothes.

Janitor—door-keeper of the bath and of the gymnasium.

Fornicator—the furnace-man or stoker.

Possibly, according to Mercurialis,

Piliorepus—the man who supplied balls of pitch or of tow covered with pitch to get up the heat, though the word is generally used for a player at ball.

There must have been a large number of stokers, for, not to speak of nearly 600 ft. of furnace front under the tanks, there must have been stokers employed to heat the furnaces under the laconicum, and to heat the water in the furnace-courts, nor can we suppose that the cloisters of the gymnasium, the ephedia, the libraries, &c., had not separate furnaces. There must, too, have been the slaves who unloaded and stacked the wood, and who supplied the stokers, gardeners, and under-gardeners, who watered the trees and shrubs and pruned them; slaves who swept the paths and seats, turncocks for the water-pipes, and when the baths were lighted, lamp-lighters and lamp-cleaners, not to speak of permanent workmen for small repairs.

There was once a belief that the Roman spheristerium, translated as a tennis-court, was circular; this belief was strengthened by a passage in Pliny's description of his Tuscan villa, thus translated by Melmoth:—“Over the undressing-room is built the tennis-court, which by means of different circles admits of different kinds of games.” The circular halls in the apses of the peribolus were possibly spheristeria.

I want to draw your attention to two points which exhibit the forethought and contrivance of the Roman architects in a very marked degree, particularly in respect to practical utility and economy,—the first in respect to the supply and heating of the water, the latter in respect to the building itself.

When we examine the drawings of the reservoirs that fulfil the offices of holding, filtering, and warming the water, we find the utmost care bestowed on securing all these purposes at once; the offices through which the water reached the lower tanks had rims round them, rising above the floor, to prevent the mud running off with the water, and every artifice was used to get as many heating surfaces as possible. The upper tanks got a little warmed by the sun, and heated by the rising of the hot water from the lower tanks; the lower tanks were not only warmed from below, but the upright flue-pipes were close together, as in the laconicum, and formed the grounds for the plastering of the sides, which was of opus signinum, or mortar mixed with ground pothards. The sides of the lower tanks were, perhaps, hotter than the bottom, on account of the thickness of the tiles, concrete, and plastering. Vitruvius, in the following passages, gives the method used in his days for making hanging floors, and this method seems to have been adhered to in after times. His words are as follow:—“The hanging part of the hot room is thus made:—Foot-and-a-half tiles are spread on the ground, inclined to the furnace, so that if a ball be thrown in it will not remain within, but will return again to the mouth of the furnace, so that the flame itself may easier play under the hanging parts; on these tiles piers are built of 8-in. bricks, so disposed that 2-ft. tiles can be placed on them. The piers have a height of 2 ft., and these are built with clay, kneaded with hair, and above 2 ft. tiles are placed, which support the pavement.” And this is precisely the way in which the piers of the hanging-floor of the laconicum at Caracalla's Baths are built, the clay being burnt into red terra-cotta. Each of the sixty-four tanks were about 50 ft. long, 28 ft. wide, and

30 ft. high, and, when full, contained nearly fifteen million gallons of water. When the two tiers of tanks were full, there must have been a pressure of 33½ cwt. on each square foot,—an enormous pressure.

There was a bursting pressure of about 1,400 tons on the outer wall of each double tier of tanks, i.e., two in height; the walls, it is true, are about 8 ft. thick, and next the grounds the reservoir is abutted in the middle by the trimmer arch supporting the seats of the grand stand. I do not think the water can have been more than tepid on account of the thickness of the bottom; in the laconicum the total thickness is from 16½ in. to 22 in. from the bottom of the 2-ft. tiles to top of the marble floor, and, if very great heat were applied, the lime would have been turned into quick lime. So that the water might lose as little of its heat as possible in going 500 ft. from the tanks to the baths, each pipe was put inside a terra-cotta flue-pipe from the hypocaust. The water that was wanted very hot must, I think, have been heated in the cauldrons of the furnace courts inside the baths.

One or two more remarks, and I have done with Caracalla's therma. A proof of the skill of the architect is the small ratio of the area of support to the whole area;  $\frac{1}{5}$ , rather more than  $\frac{1}{4}$  or  $\frac{1}{6}$ , while in Nôtre Dame at Paris, where the bulk of the vaulting is a mere shell, and there are no walls but the outside ones, the ratio is  $\frac{1}{40}$ , or nearly  $\frac{1}{4}$ , and Nôtre Dame is cited as the highest instance of this skill.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE sixth ordinary meeting of this Institute of the present session took place on Monday last, Mr. Alfred Waterhouse, R.A. (President) in the chair.

##### The Royal Gold Medal.

The President said,—Gentlemen, it is a duty to announce to you that, in pursuance of By-law 76, the Council propose to submit to Her Majesty the Queen the name of Sir Charles Thomas Newton, K.C.B., Antiquary to the Royal Academy, as the recipient of the Royal Gold Medal for the current year, for his works as a man of science and letters (applause).

Mr. W. H. White (Secretary) then read By-law 76.

##### The Application of Art to Architecture, Indian and Other.

Sir Richard Temple, Bart., M.P., next read a paper entitled “The Application of Art to Architecture, Indian and Other.” Sir Richard began his paper by restricting the discussion to architectural beauty, with the proviso that really beautiful structures were useful simultaneously. One among the final tests was picturesque. To that end “composition,” the technical sense pictorially, must be studied. In reference hereto certain principles were selected for application: first, grandeur of effect with subordination of all lesser parts to one more central object; second, principal light and shadows; third, distinctness of character; fourth, variety, or diversification; fifth, scale of proportion; sixth, colour, natural or artificial; seventh, adaptation to local usefulness; eighth, the governing and directing idea. Several styles of architecture in British India were to be tried by these tests. First, as a guarded modern Hindu architecture, the style was poor generally in size and grandeur, though not deficient in elegance, and was rich in ornamentation. Among palaces, that at Deeg, near Bhurtpore, was described as a model of beauty, but some of its ideas were probably borrowed from the Mahomedans. The gigantic cisterns known as “Bâolis,” were much commended. Among the temples, the “Shiwâla,” in North India, shape was described as graceful and elevating. In Southern India the temple gables were called “Gopurams” were grand, though verging on the grotesque. Some allusion was made to the Nepalese architecture in the Eastern Himalayas, partly based on Chinese models, and to the finely-carved woodwork of the Mahabrat palaces in Central and Western India. The writer then took a retrospect of the antique architecture of the Hindu race, selecting four instances of the grandest and noblest kind—namely, the Black Pagoda at Orissa; the red-stone ruin at Bindrabun, near Agra; the grey-stone ruin at Islamabad, in Cashmere; the Shiwâla of Bodhi Gya in Behar. In each of these the grandeur, t-



unity of design, the subordination of ornament to simplicity of effect, the definiteness of character, the pervading idealism, were strongly commended. The effect of the Black Pagoda and the Bodhi Gya was in the exterior only. But in the temples of Bindrabun and Islamabad the effect was good equally in the exterior and the interior. The quaint little gem of a temple at Pandrenton, in Cashmere, was also mentioned. The effect was considered of the inspiration of national pride and religious enthusiasm upon the ancient Hindu architects. One great class of work, that of the "rock-cut temples," was excluded from the paper, as not belonging properly to architecture. One instance only was mentioned, that of Kailās at Ellora, as being almost the only surviving example of colouring artificially applied to rock or stone. The next branch of the subject was the Buddhist architecture. The famous "Tepes" were passed over because their architectural superstructures were lost. Four cardinal instances were selected,—the cave at Karli, near Bombay; the Monastery at Pamionchi, in Ilkikim of the Eastern Himalayas; the Pagoda at Rangoon; the Pagoda at Prome on the Irrawaddy. The dignity and simplicity of the Karli cave-temple were commended, and the capitals of the pillars, consisting of groups of elephants, were noticed. The umbrella-shaped roof at Pamionchi was cited as an adaptation of bamboo material to a wintry climate. The Pagoda of Rangoon, cased in copper with gilding, shot up like a flame under the sunshine. Its exquisite curves, its delicate gradations in form, and its tapering sublimity, were commended. To the Pagoda at Prome were added the subsidiary objects afforded by wooden staircases up to the platform, with roofing and pinacles also of wood. The third branch was the Mahomedan architecture. The growth of this pathless style, through several centuries after the first Mahomedan invasion of India, was lightly traced. Examples were cited, ending in the great dome at Beejapore in the Deccan, and the Kootub tower near Delhi. The paper then passed to the examples of the Mogul period, as reaching the climax of architecture in India. The instances selected were the imperial mosques at Lahore and Delhi, the Pearl mosques at Delhi and Agra, and the Taj Mehal at Agra. The form of these pure mosques and of their quadrangles was set forth, and their beauties were analysed; their faultless symmetry, their perfect proportion, their elegance and uniformity of design were commended. They all had colour in the simplest degree under azure skies. The two imperial mosques had red-stone and white marble in combination. The two Pearl mosques were of white marble only. As the culminating glory, the Taj Mehal was adduced. But its majesty, simplicity, chasteness, symmetry, and proportion were indescribable. Its marble material remained pearly white under the blue skies of a dry climate for centuries. The architectural review continued with a notice of the coloured decoration on the surfaces of many Mahomedan buildings, those in Sind especially, produced by the fixing of colours on earthy substances by an art now lost. The paper concluded by a summary application of the tests to a few of the structures in Europe, such as the interior of St. Sophia at Constantinople; the interiors of the Chapel of the Escorial, near Madrid, and of Cologne Cathedral; and to the grand group in London afforded by the Houses of Parliament and Westminster Abbey viewed in combination.

The President, in inviting discussion, said that the very remarkable paper they had just listened to would, he had no doubt, call forth various ideas from those whose experience, training, and interest might enable them to speak with authority on the romantic architecture that had been confided to British care in India. They must all feel flattered that the art which had evoked the sympathy and admiration of such a man as Sir Richard Temple was their own art, however differently the architecture might be treated, or had been in India in the past to what it was in England at the present day (applause). Sir Richard had spent his life in administering and governing vast provinces of India, and in ruling over millions of his fellow-subjects, but notwithstanding all his labours he had spared the time sufficient to study, appreciate, and make these beautiful pictures they saw on the screen and on the table, and at the same time to draw conclusions of his own as to the principles which should govern design, from the architecture of that

mighty empire. He would like to say a word or two about some of the points mentioned in the paper, but would call upon others to speak, in the first instance.

General MacLagan remarked that, though only a visitor, it gave him great pleasure to add a few words with regard to the very interesting paper they had heard. Sir Richard's descriptions of the various styles of architecture in India, and especially his somewhat elaborate and most excellent account of the buildings of the Mahomedan period, were full of interest to one who, like himself (the speaker), had been well acquainted with the buildings for many years. Those beautiful structures, especially of the Mahomedan period, had found a response in the hearts of the people of India, as could be seen from the tasteful examples to be met with even in the minor villages of the north of Hindoostan. Sir Richard Temple was acquainted with the excellent examples of wood-carved tracery on the gateways, &c., of the Punjab, showing how the people desired to have something that was pleasing to the eye. Then, again, the massive and somewhat clumsy-looking boats which traversed the rivers of the Punjab invariably had a certain amount of ornamentation in carved woodwork, showing that their owners were not satisfied with what simply answered its purpose, but liked something beautiful to look upon. Another matter that had often struck him was the fine positions the Hindu and Mahomedan architects selected for their buildings. In Cashmere, some of these fine structures were placed against the sides of wooded hills, with a background of enormous cliffs, the addition of the picturesque being very great. In the case of the sacred bathing-places of the Hindus in the North-west Provinces, their situation was chosen with much art, showing the romantic sweep of the river, and the encircling hills, with gleaming snow-peaks in the distance. He was glad to find that Sir Richard had not made any allusion to the tradition of the Taj Mehal being the work of a European architect. It had been stated that it was the work of an Italian; but every one who looked at it, and saw how it was really the crowning type of Mahomedan architecture, would not be inclined to receive such a tradition, resting, as it did, on so slight a basis. India was now visited by travellers, statesmen, sportsmen, and artists, and he would suggest to the Fellows of the Institute that it offered a splendid field for the visits of cultivated architects, who would find much to gratify their taste, and many ideas which they could bring home and impart to others (applause).

Mr. R. Phené Spiers proposed a vote of thanks to Sir Richard Temple for his admirable paper, and for his kindness in bringing so many of his interesting and really marvellous drawings (applause). He (the speaker) had never been in India, but about a year ago he undertook to read a paper on Saracenic architecture. At that time it was his intention to confine the paper to the countries he had visited—viz., Syria, Egypt, and Turkey, but in attempting to enlarge its scope so as to deal with the Mahomedan architecture of India, he felt himself quite swamped by its extraordinary variety. In fact, it was impossible to grasp it or to deal with it in his paper. With reference to the question of the origin of the Taj Mehal being due to an Italian artist, he could not at the moment recollect upon what the discussion turned, but there was no doubt that anyone who looked at the detail of its interior ornamentation would be struck by its resemblance to Italian work. He understood the contention also was that the influence of Italian art came through Persia, which was influenced by drawings and features derived from Italy, the Persians subsequently slightly influencing the artists who designed the Taj Mehal. The interior was inlaid with marvellous ornamentation, but it was possible that the conventional representations of flowers and leaves, which bore a resemblance to Florentine work, were purely accidental. The great dome at Beejapore had been commented upon before in that room, and the theory of the thrusts of its ribs entered into on several occasions. What had struck him in taking up the subject last year was the fact that whenever a nation of artists, at any period, got hold of some new theory of construction, they seemed to take a leap, and to make an extraordinary advance. And it would appear that the architects of Beejapore, and of the mosque which preceded it, having found out that new method of resisting the

thrusts of the arches, had taken a leap and become imbued with the new feeling of architectural design.

Mr. Arthur Cates seconded the vote of thanks, adding that the Institute were fortunate indeed in getting a man so thoroughly master of the subject as Sir Richard Temple was to give them such a paper. The suggestion made by General MacLagan was one which he hoped the Council and the members would bear in mind. They had been in the habit of sending their students to Italy and Greece to master the architecture of those countries, but they might well, with the facilities for travelling now offered, send some students, whose studies and abilities rendered them capable of taking advantage of it, to study and report upon the great buildings and admirable works which had been so well described that evening. Much of the charm of those structures depended, not only on the materials used, but also on the climate—upon what might be called the aerial effects. Such effects could hardly be looked for in Britain, therefore any of the edifices, if bodily transported here, would look incongruous and inharmonious, having grown out of the necessities of the climate, and the opportunities afforded to their designers. Still, it was quite clear from what had been said by Sir Richard Temple, that students of architecture might well devote some considerable portion of their studies to the consideration of those beautiful works, and to using them as a groundwork upon which their designs, applied to the needs of their own country and its climate, might be based (applause).

The President said he had been much pleased at their attention being again called to the fact that the architect should be first of all an artist (applause). One heard on the Continent of the student in construction going in for his examination, and when he came out successfully being dubbed a civil engineer, but if he failed, contenting himself with the position of architect (laughter). That seemed to show a wrong appreciation of what should be demanded from the architect. He was also pleased at their attention being called by Sir Richard to the sketchable character of successful buildings. It was not essential that a building, to be sketchable, should not be perfectly symmetrical. The human face was a very sketchable object, yet it was as nearly as possible perfectly symmetrical, and he believed, most of the examples of buildings that had been brought before them that evening were symmetrical buildings. He might say that Sir Richard Temple had added to the debt of gratitude they owed him by stating that he would permit his invaluable sketches to remain on the table during the next week (applause).

The vote of thanks was then put, and was very cordially received.

Sir Richard Temple returned thanks, and said he would be very happy to allow his sketches to remain at the Institute for a fortnight (applause). He had brought them with him all the way from Worcestershire, in spite of the inclement weather, and he might mention that he had so arranged them as, almost without exception, to represent every building he had described in his paper. The true story of the origin of the Taj Mehal was to be found in a book entitled "Rambles of an Indian Official," and the dispute about it must be regarded in the same light as that about the authorship of Shakespeare's plays (applause).

The President announced that the next meeting would take place on the 25th inst., when a paper would be read by Mr. T. M. Rickman, F.S.A., on "The Writing of Specifications."

The proceedings then terminated.

#### THE ARCHITECTURAL ASSOCIATION: ARTIFICIAL ILLUMINATION.

THE following are some notes of the discussion on Mr. John Slater's paper on this subject, read before the Architectural Association on the 1st inst., and printed *in extenso* in last week's *Builder* (see p. 106, ante):—

Mr. Henry Lovegrove proposed a vote of thanks to Mr. Slater, and congratulated the Association on having so large a gathering to hear a paper on such a subject. Little had been said about the impurity of gas, which, in spite of the progress of science, was said to be very impure. He believed the old argand burner was as good as anything, if work had to be done by night, in the way of fine drawings.

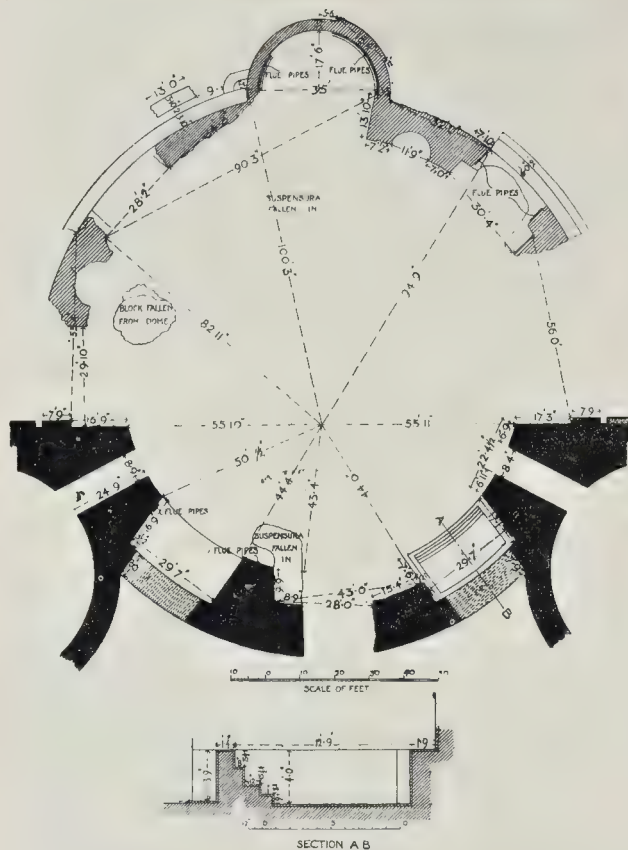


## Illustrations.

## BATHS OF CARACALLA.

THE elevation and plan, restored, of these baths are from drawings made as illustrations to Professor Aitchison's lectures on Roman architecture at the Royal Academy. The subject is dealt with in the two lectures published in the last and in the present numbers of the *Builder*.

A plan of the laconicum, on a larger scale, is subjoined. The portions shaded in line represent the recent excavations, and are given from Professor Aitchison's own measurements.



Baths of Caracalla.—Plan of Laconicum. Measured and Drawn by Professor Aitchison.

The Wenham light also was good, and if the products of combustion were allowed to pass away in a tube, no damage was done to the room. With regard to electric lighting, its adoption had been delayed for some years by the greedy speculation which took place at its first introduction. It had also been placed before the public in a very stupid manner at the beginning.

Mr. W. Burrell seconded the vote of thanks, and remarked upon the great amount of knowledge to be derived from such a scientific lecture, compared with the information too often only gleaned from manufacturers' circulars. Until the electric light could be more easily obtained, the various improvements in gas-lighting must continue to be of the utmost importance to the architect.

Mr. T. L. Worthington ventured to suggest to the Committee that more such scientific papers should be read before the Association (applause). He knew from experience how ignorant many of them were of such subjects, which should have much more attention paid to them.

Mr. E. D. Webb attributed the reason why the electric light had not come into general use to the action of the first Electric Lighting Act. A company had now been formed at Earl's Court, which offered to supply the light to a group of fifty people at the same price as gas. The Dublin Corporation had decided to adopt it in all the streets of their city, and he believed it was also to be introduced for lighting the new buildings on the Salisbury estate in the Strand.

Mr. Brady contended that every architect, and all connected with the building trade, should make themselves acquainted with everything appertaining to the best methods of disposing and arranging the pipes and wires.

Mr. Cobb said that the electric lighting of the future would be central lighting, which would

shortly be obtained from central stations. That was a part of the work that architects should study as much as possible, and also the wires and fittings, for the electrical contractor was no more to be trusted than any other contractor. They ought, therefore, to be acquainted with such rules as those issued by the Phoenix Fire Office.

Mr. H. W. Pratt considered that the electric light, in its form and distribution, was still in its infancy.

Mr. F. R. Farrow remarked that he had had the misfortune to work in an office where argand burners were used, and the result was to be seen in the scanty locks which he was able to show (laughter).

Mr. Scott thought the reason why electric lighting had not come more to the front was rather due to the speculators than to the Act, which in its way had done a great deal of good.

The Chairman (Mr. H. D. Appleton, President) said he believed the electric light people would now undertake to wire an old house for about 35s. a lamp, or an entirely new house for 20s. to 25s. He understood for a country house, that a 100-light installation, including the machinery, would cost from £6 to £8 a lamp.

The vote of thanks was then put, and carried by acclamation.

The Chairman briefly replied, and acknowledged his indebtedness to Mr. Sugg for putting up the specimen gas-fittings and burners referred to in the lecture, and also to the gentleman who had sent the new oxygen and gas-light.

**A. A. Lyric Club.**—We are asked to mention that the next entertainment of the A. A. Lyric Club will take the shape of an informal concert, to be held at the Café Monico on Thursday next, February 21, at 7.30, prior to which the members will dine together.

## DESIGN FOR A THEATRE FOR A LARGE TOWN.

## FIRST PRIZE DESIGN IN THE TITE COMPETITION.

THIS design, by Mr. Frank T. Verity, has been awarded the "Tite Prize" this year at the Royal Institute of British Architects. This prize, it will be remembered, was founded to promote the study of Italian architecture, and "A Theatre for a Large Town" was the subject set by the Council of the Institute on this occasion. The competitors this year appear to have kept more strictly to the style of architecture contemplated by Sir W. Tite in instituting the prize. Last year the definition "Italian architecture" seemed to have been read by some of the competitors with a remarkable laxity of interpretation, as if it were to include what is called Italian Gothic, which most certainly was not the intention of the founder of the prize.

In reference to his design, Mr. Verity says:—"The conditions laid down for the competition were for a theatre to be erected in a large town on a site, 150 ft. by 90 ft., with streets on all the four sides. The auditorium to seat about 800 persons, a foyer on the principal floor, and a porte-cochère to the main entrance. To be designed in the style of the Italian Renaissance as represented by buildings in Venice erected between A.D. 1450 and 1600. The object of the author has been, not only to provide these essentials, but to so arrange his plan, having in mind the requirements of the Metropolitan Board of Works, as to give easy and duplicate exits from all parts of the house."

Mr. Verity appears to have succeeded in producing an admirable plan, but, of course, the conditions of a theatre with streets all round it are exceedingly favourable for the arrangement of exits, and such as in London at present are seldom practically available; though every effort should be made by municipal legislation to render them available and even compulsory in future.

In regard to the conditions, we may observe that a theatre to seat 800 does not quite come up to the amount of accommodation suggested in the phrase "a theatre for a large town."

## SECOND PRIZE DESIGN IN THE TITE COMPETITION.

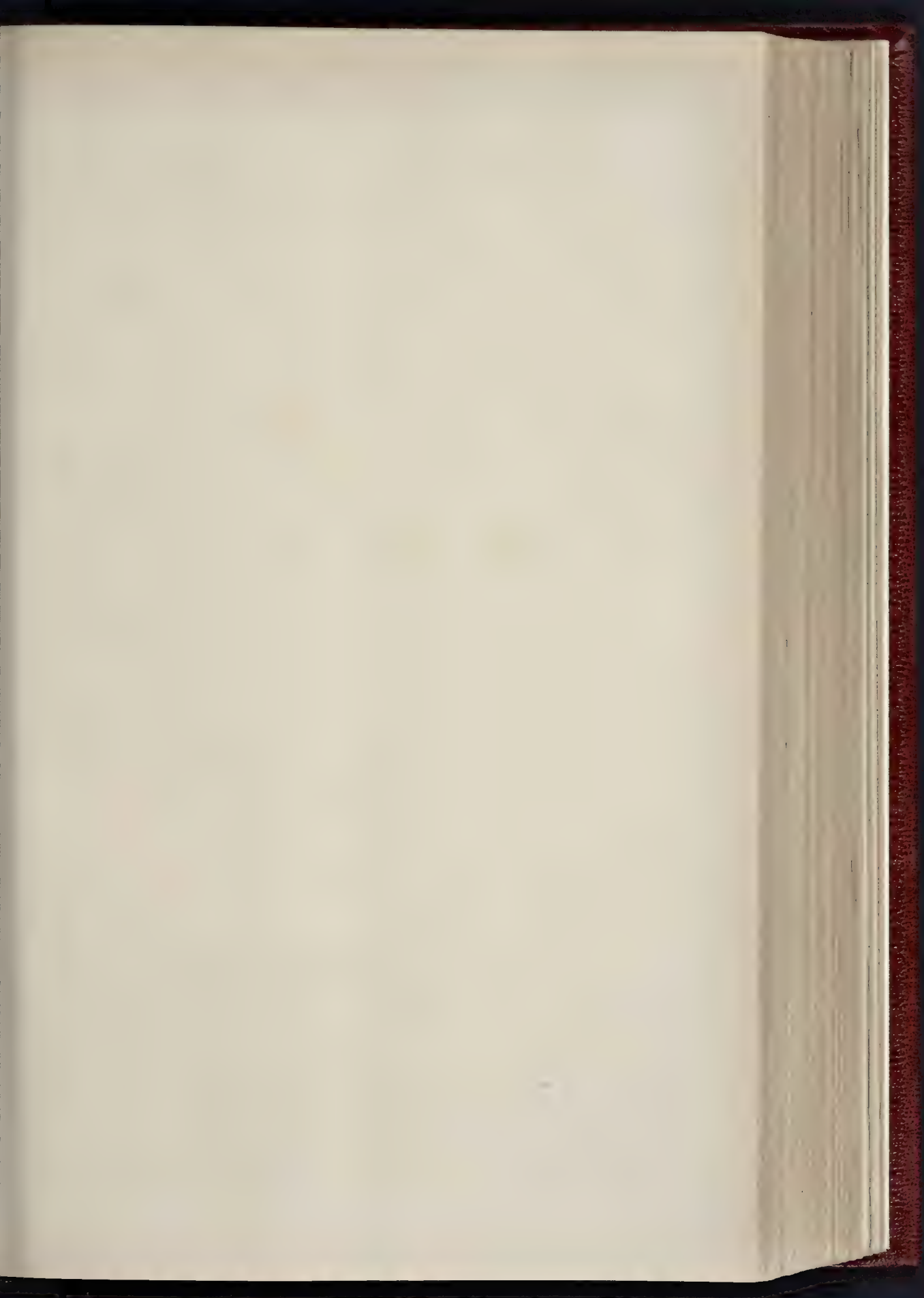
This design, by Mr. E. Boehmer, was awarded the Medal of Merit in the Tite prize competition. The author has sent us the following notes as to the scheme of the design:—

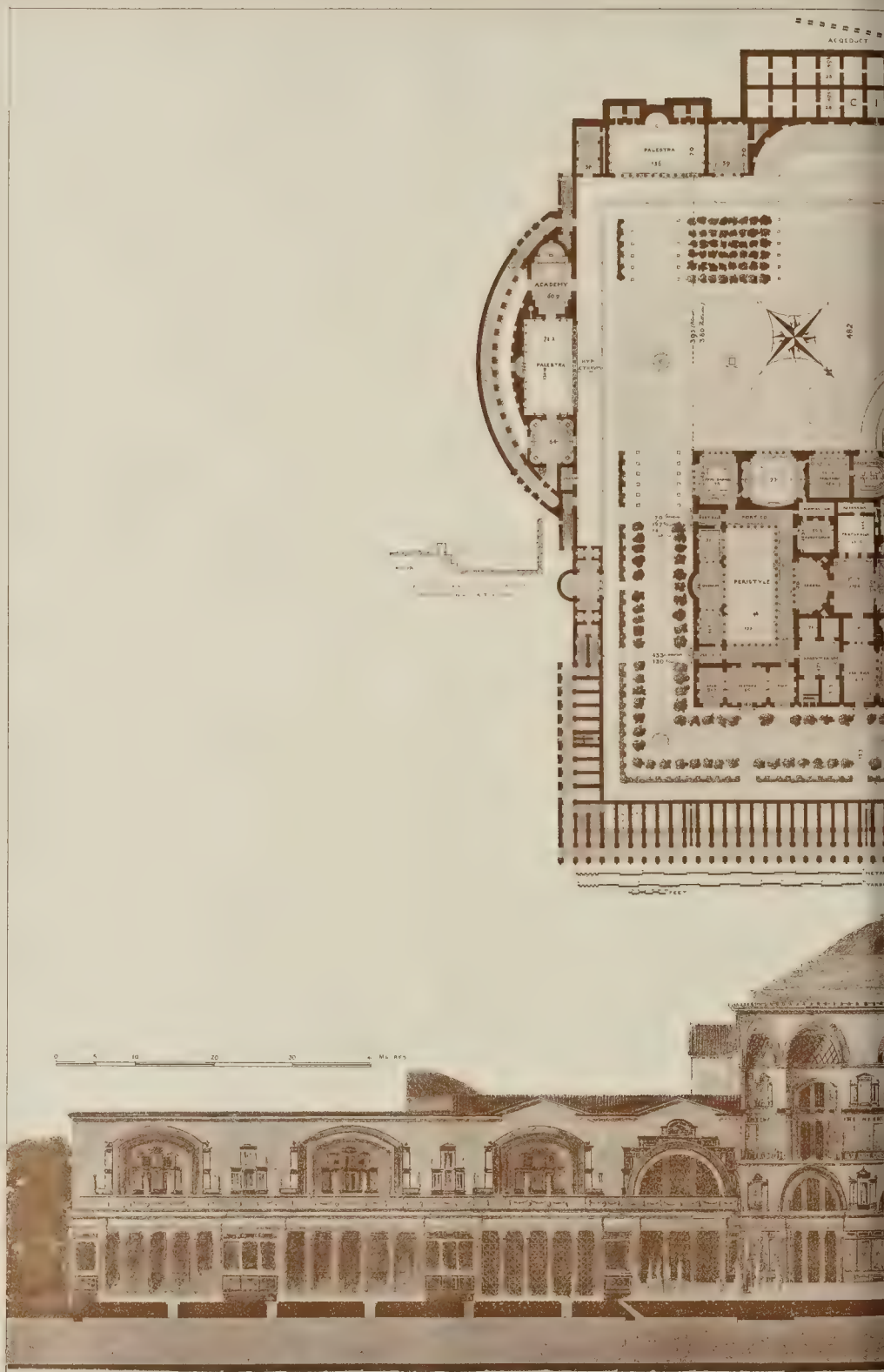
"This theatre has been planned on the lines of many Continental theatres, a novel feature being the introduction of a carriage-drive straight through the building. A porte-cochère was made a special condition in this competition, and it was found undesirable to place it outside the building, where it is a continual source of danger if used at the same time as an approach for carriages and people on foot. If placed in this position it would also materially curtail the depth of the stage, which it has been endeavoured to make of ample dimensions. The approach to the stalls and first and second circle is by staircases leading from the grand vestibule; the pit and gallery have separate entrances at the sides of the building. The walls enclosing the auditorium are carried up beyond the heights of the adjacent roofs, thus emphasizing its amphitheatrical shape also in the exterior of the building, and stamping it with the character of a theatre, as has been done with much success in the Paris Opéra-house, the new Hofburg Theatre of Vienna, and in Semper's beautiful Hof Theatre at Dresden."

## SCREEN, ST. JOHN'S CHURCH, LEEDS.

THE church from which the screen illustrated is taken, and which is in many ways a very unique building, was built by John Harrison, a local benefactor, in 1634. The plan of



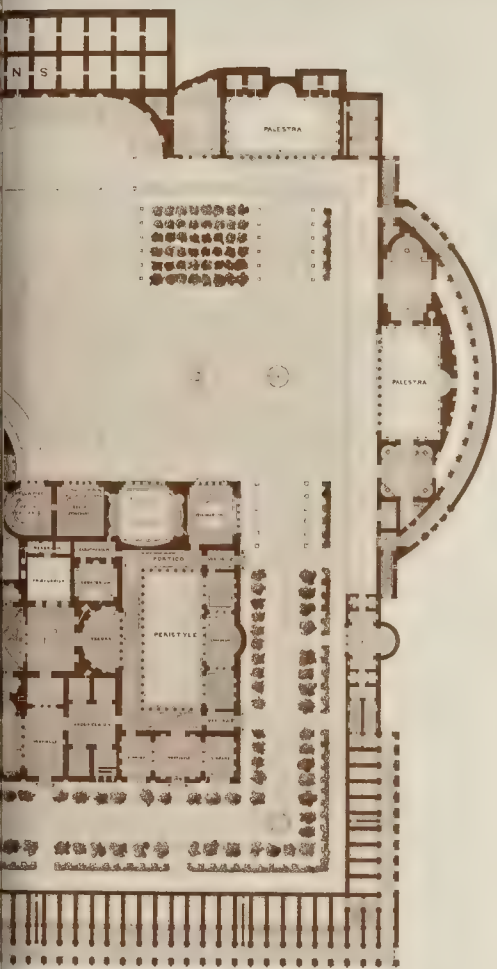




PLAN OF THE BATHS OF CARACALLA—

"From Professor Aitchison's diagrams for his Royal Academy Lectures."

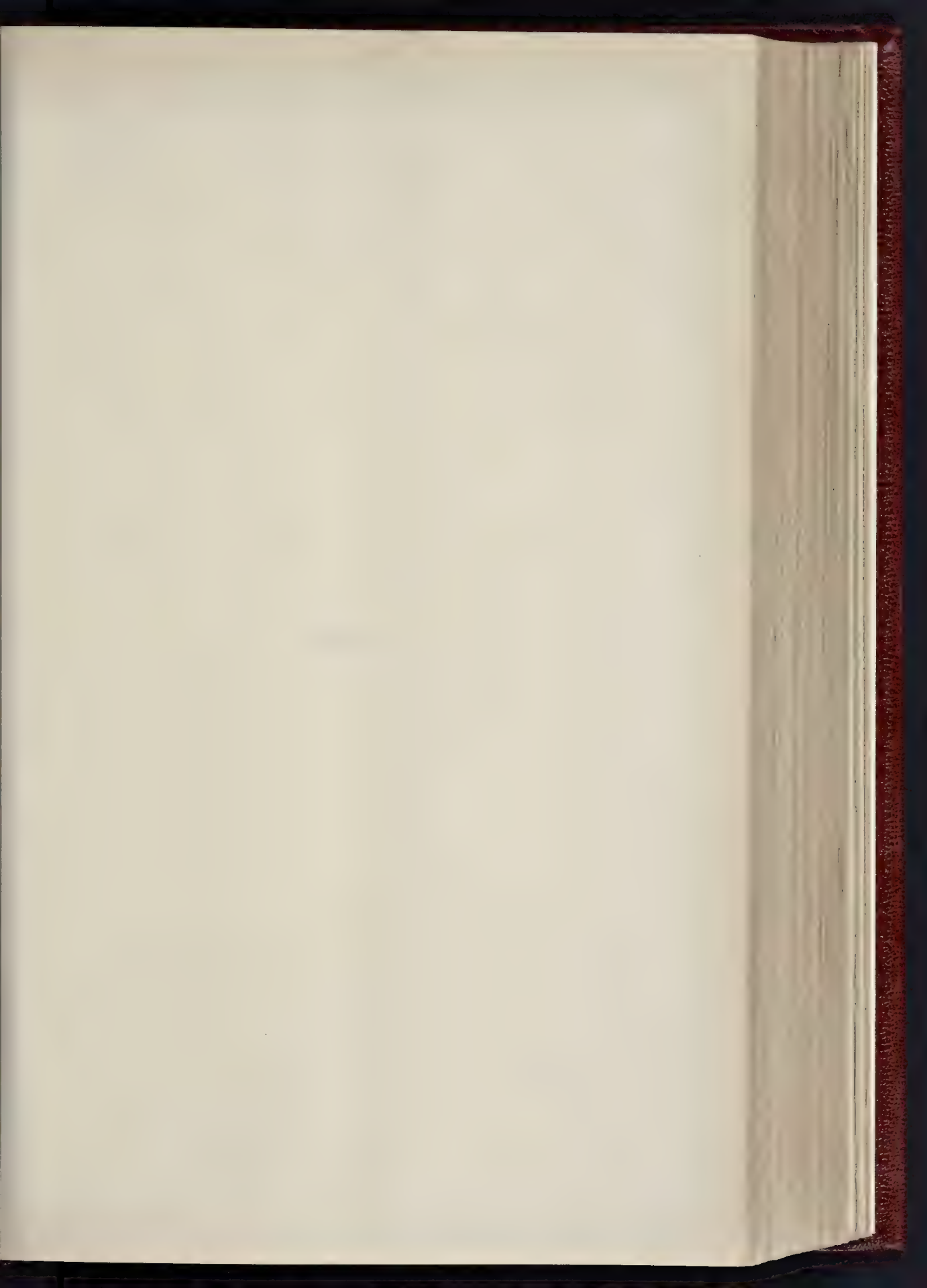


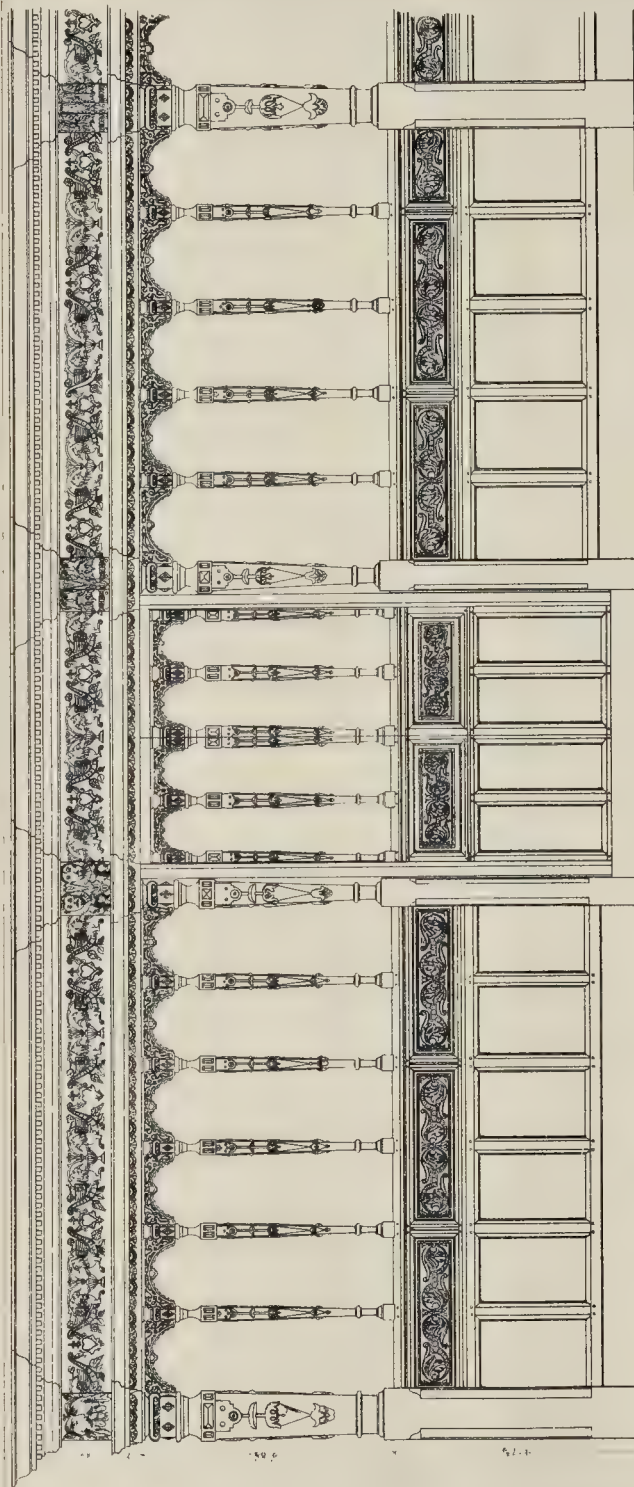


WITH ELEVATION FACING THE KYSTUS.









Elevation towards Nave

Scale of Feet.



Panel in Dado.





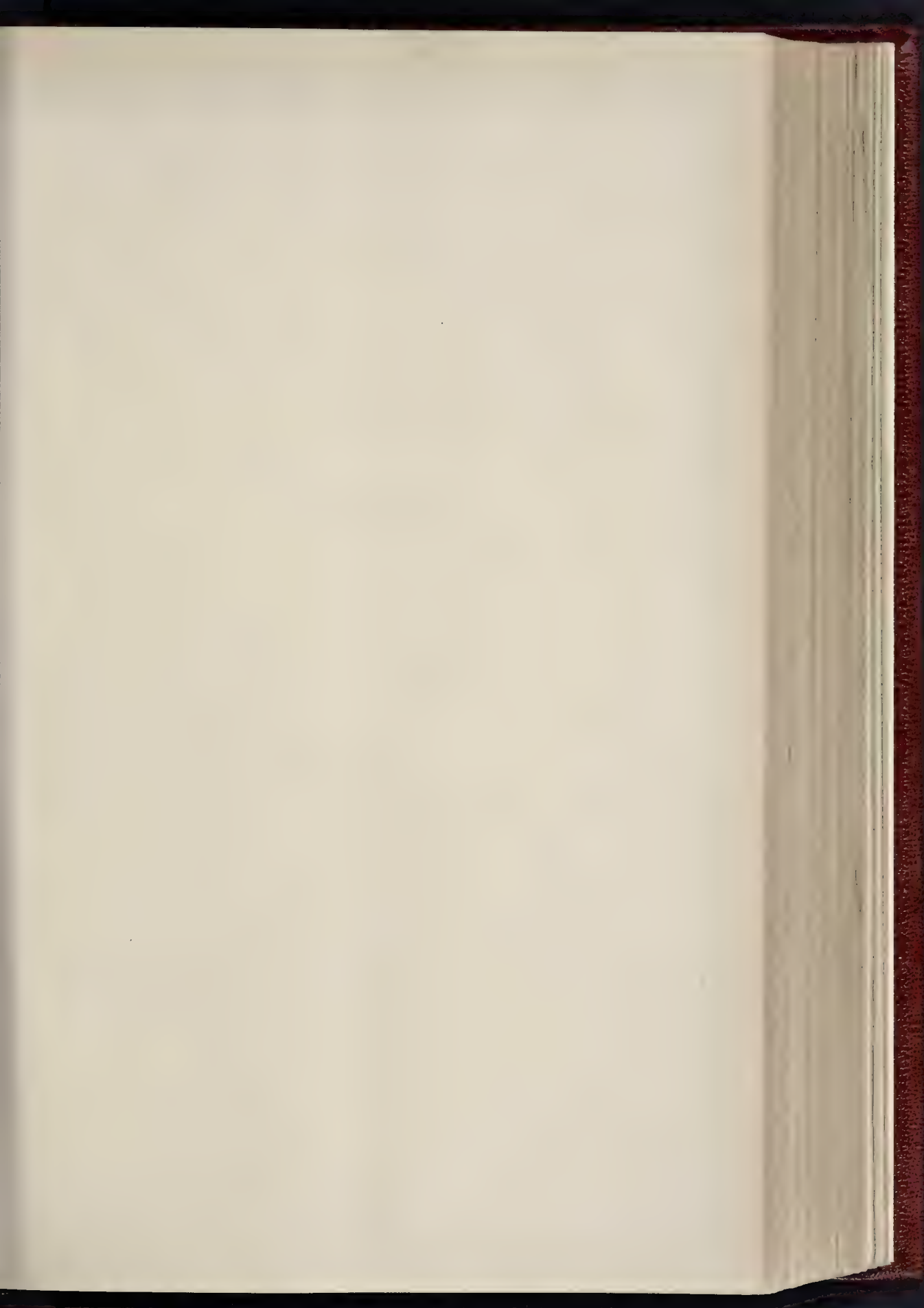
DESIGN FOR A THEATRE FOR A LARGE TOWN—By MR. FRANK T. VERITY.

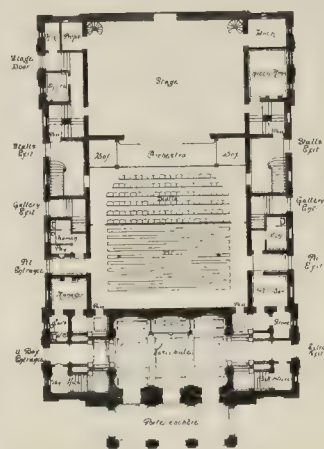
DETAIL ELEVATION.

awarded the Tite Prize, R.I.R.A., 1889.



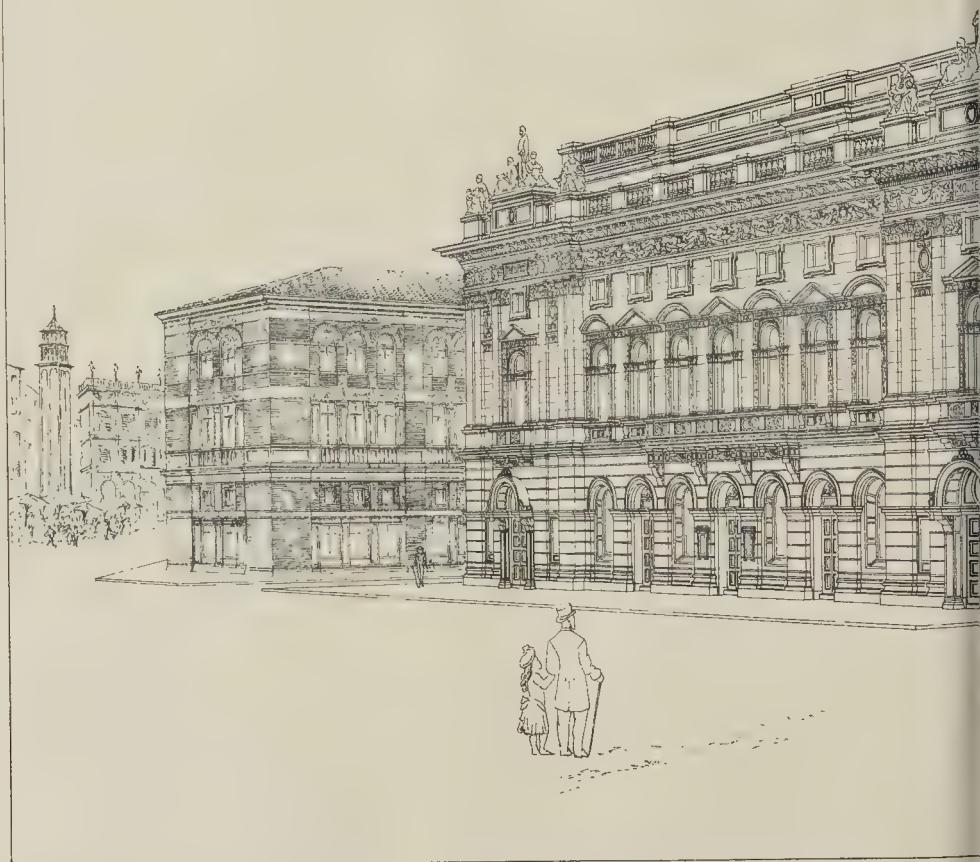




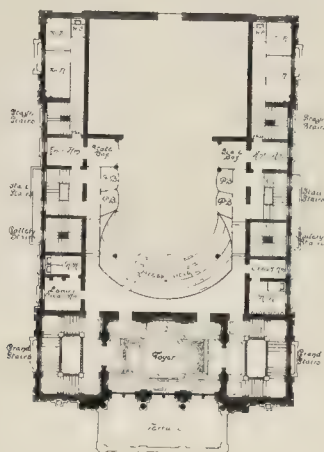
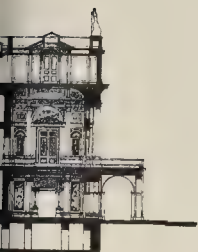


GROUND PLAN

0 20 40 60  
SCALE OF FEET







CIRCLE F. AN



PHOTO. THE SHAKESPEARE & 22 MARTIN LANE CANNON ST. LONDON E.C.





the church is somewhat uncommon, and is very interesting as that of a post-Reformation church before the Gothic spirit had entirely died out. The body of the church runs uninterruptedly from east to west, and is divided down the centre by an arcade, so forming a double nave, the chancel being only separated by the screen, half of which is shown in the drawing, and this division is also emphasised by the roof principal over having some curved and pierced strap ornament under it. The building is roofed by two parallel roofs, with a valley over the centre arcade; it has carved oak principals, with pierced pendants under, the under side of the rafters being divided into square panels, filled in with strap ornament in plaster. The whole of the pews are of carved oak, with panels like the screen, and of great variety. The original pulpit, with sounding-board over, still remains, and is a beautiful specimen of seventeenth century workwork.

FRANCIS W. BEDFORD.

#### CHAPTERS FROM THE HISTORY OF CARPENTRY AND JOINERY.\*

We now arrive at a third chapter of our subject,—a glimpse at Europe since the Roman times.

The erection of post-Roman buildings of permanent interest in Europe covers a period of about nine hundred years, which begins with the general resumption of building as an art, and comes down to our own day.

Between the decline of the Roman Empire and the tenth century there is a long and dark period, when little peaceful activity and much warlike strife went on in Europe, and this has left nothing for us to consider to-night. After this comes the period known as the Middle Ages, which may be roughly described as beginning a little before the first Crusade and continuing to the Reformation. We have a great many remains of work done at that time in our own country, and the same is true of the time which followed it—the Modern period.

England (and when it is practicable, London) will chiefly illustrate this history for us, though I must refer to Continental woodwork also.

There is not much builder's work, of any sort except the most sturdy, which has come down to us from the time of our Saxon kings; but there is,—or was ten years ago,—a small ancient timber church at Greenstead, in Essex, near Margate, of which Sir Gilbert Scott gives a description in his lectures. He says that "the foundation of it can be traced back to A.D. 1013, which is more than fifty years anterior to the Norman Conquest. The structure is composed of cleft oak trees, grooved and tongued together by their edges, and let into grooves in horizontal heads and cills. The exterior of the trees was exposed on the outside of the church, the sapwood of which having long since perished, the furrowed and gnarled heart is now seen, presenting a most ancient and interesting appearance. It has been repaired, but I trust that its antiquity has not been compromised."

The Norman Conquest placed this country at the disposal of a race of very energetic and enterprising invaders, who were builders, sailors, and ship-builders. In every part of England, Norman churches and castles, and, in the great towns, Norman cathedrals and monasteries sprang up, and the floors and roofs of these buildings required the skill of the carpenter, and some of the roofs,—such, for example, as that over the nave of Peterborough Cathedral,—were of not inconsiderable span, and carried a load of wooden ceiling. As Gothic architecture gradually developed, the roofs, timber spires, and floors, and the internal woodwork of churches and other buildings improved; though must be admitted that, with our present notions and habits, we should have considered the carpenters of those early times clumsy; and it is impossible to deny that some of the earlier roofs of which the framing still remains are unscientific. The most important works of the carpenter are timber roofs. I had the honour of giving a lecture on this subject in 1885, and many of you may have heard that lecture, and all can consult it in the building journals, which shall make my reference to this branch of the subject brief, pointing out, however, that the early carpenters used very large timbers, placed

very close together, and of oak or chestnut, so that their structures if heavy were very strong.

I had to point out in that lecture how the use of a tie-beam was early abandoned and a collar substituted as roofs became more steep; how in various ways curved ties, ribs, and struts were introduced; and how what is called a wall-piece, which it was always customary to use, was made to project inwards, and was supported by braces, and grew by steps which can be traced in a succession of English church-roofs, till it became that peculiarly English feature the hammer-beam. The finest specimen of the hammer-beam roof is that over Westminster Hall, dating from A.D. 1397. The peculiarities of English roof-carpentry, when at its best, are well illustrated in this roof. They may be pointed out as the use of the hammer-beam; the use of vertical and horizontal main timbers within the lines of the principal rafters, to the almost total exclusion of raking struts or braces,—keeping all horizontal ties high up; the introduction of curved ribs and struts so as in some degree to give an arched form to the main lines of the truss, and the filling in of all spaces in the framework with small bars. In several respects these peculiarities are not those to be met with in modern roofs, but it must not be forgotten that the material was hard wood, and the joints were excellently made and pinned, so that the timbers were far more rigid when framed together than ours.

No one can, I think, look at this noble roof without feeling that, as a work of fine art executed in carpentry, it is one of the most successful that have come down to us. The roof really is Westminster Hall, and nowhere have we an example of carpentry so thoroughly architectural.

Among the causes of its success we must reckon the excellence of the lines of the truss and the regular repetition of truss after truss. The repetition of any framework good enough to span that vast space would strike the eye, for regular repetition is one of the acknowledged sources of architectural effect; but this framework is not only obviously sturdy, but it is full of beauty. The great curved ribs, the bold hammer-beams, the finely-carved angels that terminate these hammer-beams,—each of these is a striking feature, and its force is intensified by its being repeated again and again all down the long space. Then the appropriateness and beauty of the mouldings and the filling in heighten the effect, of which the force is further intensified by the introduction of a series of arched braces which run from one truss to another, and connect the whole into one roof, and by the skill with which the openings are formed where the dormer lights occur. In smaller, and perhaps in simpler, roofs, all these sources of beauty may, to some extent, be found, but nowhere else are they so perfect; and the impression they produce on the spectator is, no doubt, heightened by the great span of the hall, and the almost colossal scale on which the work has been done.

Referring you to my previous lecture for details of this roof, and for an account of other hammer-beam roofs, especially the singularly beautiful one which spans the Middle Temple Hall, I propose to ask you to consider for a little timber-built dwelling-houses, a subject of no small interest.

In France there still remained till the early part of this century, and may linger yet occasionally, half-timbered houses dating from the twelfth century. One of them is described and illustrated in Viollet-le-Duc's Dictionary. It is a small three-storied house fronting the street with side walls of masonry, which are corbelled out just below the level of the first-floor. The front wall is formed of large heavy timbers, framed together, and with the comparatively narrow spaces that they leave filled in with plastering.

The first-floor overhangs the ground-floor, but the second-floor is plumb over the first. The window-heads are partly segmental and partly semicircular, and cut out of the solid wood. The timbers are very elaborately mortised and tenoned together, the framing being more like that employed in joinery or ship-building than like carpenters' work.

From the thirteenth to the sixteenth century half-timbered work was freely employed in France in house-building, and the timbers are much more moderate in size, well squared, very carefully put together, and where enriched the mouldings are truly worked. In these timber-framed structures we may, from the first, see well carried out the principle which was uni-

versally adhered to in Gothic carpentry and joinery,—namely, that wherever the timbers met and were framed together, whether they were halved or were mortised and tenoned, they should be square. Consequently, all mouldings are stopped or made to run out to the face. There is thus as much wood as possible at the shoulders to the mortises and tenons, and the strength is kept for the places where it is most wanted.

It is almost invariably the case in these timber fronts that each storey overhangs the one below it, and at the top there is either a gable with a finely-worked barge-board, or, less frequently, an eaves-gutter and a roof, usually broken by one or more dormers.

In the general treatment there was a tendency for the timbers to be lighter as time went on, otherwise the changes in mode of framing, &c., were not great, except that in later examples you will find more diagonal braces. The ornamental work, however, *e.g.*, the carving, the enriched barge-boards, and the heads of doorways and windows, partook always of the character of the moulding and carving in general use at the time.

It is specially characteristic of French timber-built houses, that the plates into which the overhanging joists are pinned are almost always beautifully moulded, and that the gables and the dormers (where those features occur) have curved timbers, so combined with their barge-boards as to give a distinctly arched appearance to that feature.

In England, timber-built houses dating from before the fifteenth century are very scarce; we have some of that century, more of the sixteenth, and still more of the seventeenth; nor did the change in taste, which we call the Renaissance, very radically affect our timber houses.

Had it not been that they all perished in the Great Fire, we should have, no doubt, still many examples of timber buildings in London; as it is, I can only point you to one or two. The most accessible specimen is on the south side of Holborn, nearly opposite Gray's Inn-road, where the gabled fronts of several houses, modernised on the ground-floor, retain above the kind of construction which caused this ancient Company of Carpenters to hold at one time the most important position of any of the London Companies that had to do with building.

A timber-built house was what is now usually called half-timbered. It had a low plinth or foundation of masonry. The fabric of its walls consisted of vertical timbers framed into a plate resting on the foundation and into another above, and usually strengthened or stayed sideways from one to another. Usually the first set of timbers only reached to the top of the ground-storey. The joists of the first-floor, which were really massive timbers, quite unlike our modern joists, overhung, and the framing of the upper part consequently could be carried on a plate supported upon the ends of the joists, and so could project beyond that of the ground-storey. Where this occurred at the corner of a street, a massive post, often much enriched with carving, was usual, and many of these posts remain in country towns, even though the houses have been modernised. The spaces between the timbers were filled with brickwork, or more often lathed and plastered. Occasionally they were filled with tiles, and sometimes with woodwork, or even the whole boarded over.

A great many good manor-houses were constructed in this manner in the North of England, where a series of fine old half-timbered houses remaining in Cheshire and Lancashire may serve as a basis for some general remarks. The dates of the most famous examples belong to the sixteenth century, or are near it. Thus, out of a list of thirty-eight, I find seven to belong to the fifteenth century, the earliest date being 1460, and nine to belong to the seventeenth century, the latest date being 1648, but the remaining twenty-two are sixteenth century. It is astonishing to note how small the differences are between the early and the late examples. Almost without exception these homely, but very striking, houses are of two low stories only. The upper storey usually overhangs, but not in a very marked way. The gables are never of a sharp pitch. The roofs overhang considerably, and are finished by plain barge-boards, usually without finials, pendants, or carving. The walls and gables are constructed of strong timbers, well framed together, and pinned at the joints; almost always stained a strong black, and with the spaces between them filled in with plastering

\* A lecture delivered at Carpenters' Hall, London-wall, the 6th inst., by Professor T. Roger Smith, F.R.I.B.A., continued from p. 111 of last week's Builder.)



kept very white, so that the contrast is striking. There seem to be two schemes of arrangement for the timbers, but both occur sometimes in the same building in different parts. In the simpler scheme the timbers are most of them uprights, fixed very little more than their own width apart, and with a few horizontal timbers hardly breaking the monotony. Good examples of this are Aggcroft Hall, Cheshire, and parts of Bramhall Hall, Cheshire, and Worsley Old Hall, near Manchester. In the other scheme the timbers are about three times as far apart as in the last. Horizontal transoms are more frequent, and there is a strong tendency to form panels that are nearly square, though oblong upright panels are also common.

These panels are filled in by smaller pieces, often so arranged as to form a diamond, arranged with its corners resting against the sides of the main square, and having the inner face worked into some sort of quatrefoil, which figure is constantly employed in many different forms. Sometimes the long panels are filled with diagonal braces,—a whole row of these sloping all the same way,—but it is interesting to notice that crossed diagonal braces, which are very common in French examples, rarely occur in the panels, though in some instances a gable end is covered with a kind of reticulation formed of crossed beams. At Hall i' th' Wood, a late example near Bolton, attributed to the middle of the seventeenth century, nearly every form of enriched panel is used, including panels formed by the use of curved lines, obtained, probably, by selecting naturally curved pieces; and in this and some other examples the builders seem to have been bent upon covering every part of the surface with elaborate and startlingly brilliant patterns; but generally the richness is kept concentrated on such places as gables and bands of ornament, and considerable portions are kept simple in treatment. The extremely strong contrast between the black timber and the white filling-in makes all these buildings a little startling and busy in appearance.

I have mentioned that in these North Country examples the overhanging of the upper storey is not always met with and not made conspicuous. I ought to add that when it occurs it often is worked into a kind of shallow cove.

If you compare these examples with such as can be found nearer London,—say at Penshurst or Tonbridge,—some points of contrast present themselves. In the south country houses the roofs are steeper, the barge-boards more ornamental and often have pendants, and the buildings are sometimes higher. The quatrefoil and other patterns in panels rarely occur, and the timbers are not so massive, nor are they made so black. On the other hand, the upper storey generally overhangs very decidedly, and so as to cast a bold shadow; and very often a bay-window is thrown out in the lower storey, the front of which projects exactly as far as the upper timber overhang, so that the face of the bay is carried on by the face of the upper part of the building in the storey above.

One example of a timber-fronted building of the most ornamental class, containing also a fine hall, survives in London in Crosby Hall, Bishopsgate, and, though various alterations have been introduced into the interior, which is now a restaurant, I believe the front to the street, though it has necessarily been much repaired, gives a good example in the original form of what such places as this were at their best.

Following the plan I have before adopted, let us consider for a moment the carpenter engaged upon these timber-framed houses as an artist. Very few persons will deny that these buildings possess a great charm. They, of course, have the antique air which adds a touch of something like romance to the actual beauty of any work of architecture; but they have intrinsic claims on our admiration; one of these is that they display their structure. In all buildings where the construction can be traced at a glance, the mere fact of seeing how the fabric holds together seems to rivet attention and to satisfy the instincts of the spectator. This structural work has, moreover, the quality of breaking up and so enriching the surface of the wall. This pleases the eye, and, what is more, it adds to the apparent size of the building, so that quite a modest house, not much more than a cottage, rises into importance. The bold shadows thrown by the overhanging storey, where it occurs, and by the

projecting roof, are sources of striking effect when the building is lighted up by sunshine, and if the panels have ornamental filling-in, or if any of the prominent timbers or the barge-boards have carving or are moulded, such a touch of refinement enriches the whole. Simplicity in the general forms united to a good deal of variety, and richness to a certain extent, concentrated upon well-chosen points, are characteristic of the greater part of our English half-timbered houses and halls, and such a combination is almost sure to succeed.

Examples of English half-timbered work are to be found in many of our oldest towns, and also in country places. They exist, for example, at Chester, Shrewsbury, Tewkesbury, Coventry, Bury St. Edmunds, Canterbury; Weobley, in Herefordshire; Sherborne, in Dorsetshire,—all of them places of remote origin. The most interesting country examples are, of course, more widely scattered, but a good many can be found within reach of Panshurst and Tonbridge, including almost the whole of one little village,—Chiddingstone.

There are timber houses in many parts of the continent of Europe, as well as France. In many parts of Germany and Switzerland timber houses, often of great size, and sometimes of great beauty, are common, and the same is the case in Sweden and Norway, but as these buildings differ altogether from our timber houses, and they would require almost an evening to themselves, if justice is to be done to them, I shall not attempt to notice them to-night.

It can hardly have escaped at least some of you that these timber buildings in England have been described as resembling one another very greatly, and yet that the date of many of them is long past the time when a radical change of taste took place. That transformation, which we now call the Renaissance,—or the Revival of Classic Art,—which began in Italy in the fifteenth century, spread to France, made its first appearance in this country at, or soon after, the beginning, in 1509, of Henry VIII.'s reign; but after that there was a long period of transition known by the names of "Tudor" and "Jacobean" before the new style completely prevailed, and it is interesting to note that even long after the details of most stone buildings, especially in the great cities, had become quite Italianised, the old traditions influenced the builders of timber houses. In many country places they lingered on very late indeed, and in some sorts of woodwork they still exist; as, for example, in the ornaments and mouldings of some sorts of barges and of many country wagons, which resemble to this day those in use in Gothic buildings.

In other branches of the carpenter's art the change in taste was more rapidly visible. Such open timber roofs as belong to the seventeenth and eighteenth centuries are entirely different in their details and ornaments from the Gothic ones, and as time went on ornamental carpentry became much more scarce than it had been, and carpentry after the sixteenth century is chiefly remarkable for the scientific skill of the carpenter.

Carpentry was, however, largely employed in providing the shell or form of domes, high-pitched roofs, and turrets which, covered with metal or tiles, formed conspicuous ornaments on the sky-line of Renaissance buildings, and in this way it contributed to the architectural effect of many striking buildings. For example, the external domes of St. Paul's Cathedral, in London, and the Invalides, in Paris, are timber-framed and covered with lead in one case and copper in the other.

One more chapter,—a brief and imperfect one,—we will devote to joiners' work. Of very ancient joinery we have a few, but very few, traces, of the sort which ancient carpentry has left. Of Gothic, or Medieval, joinery very little remains from as far back as the thirteenth century; more remains from the fourteenth; and a vast amount from the fifteenth and the early part of the sixteenth. These examples are chiefly in the benches, stalls, and screens, and other fittings of cathedrals and churches.

Many noble examples of transitional joinery exist in the shape of the great staircases, the panelled walls, the screens, and occasionally the ceilings of the many fine mansions erected in Elizabeth's reign; and while, as we have just seen, carpenter's work lost much of its ornamental importance at the time when the Renaissance became fully established, that of the joiner continued to be prominent. Of this the choir-stalls and organ-screen at St. Paul's

Cathedral and the fittings of Wren's churches generally may stand as examples.

In the joinery both of England and France, executed at the time when Gothic architecture prevailed, we find, as is well pointed out by the great French writer, Viollet-le-Duc, two main principles:—1st. Great economy of material, 2nd. As much strength as possible secured where the parts join. It is an almost invariable rule that all the framing is of moderate dimensions. The panels are always of moderate width, so that they can be cut from one piece of wood, and no pieces of large scantling or great thickness are introduced. The material was mostly hard wood,—nearly all oak. It was selected with care; a great deal of time was devoted to seasoning it; and it came to be looked upon as very precious, and if material could be spared, even at the expense of extra labour, the preference was given to the economy of material rather than economy of labour.

The other point, the care with which the joiner of the Middle Ages secured as much of the stuff as possible at the places where his joints come, can hardly have escaped the notice of any practical men in my audience who have examined a piece of old framing, and it affects the design quite as much as the construction.

Wherever two pieces are framed together, it is usual that both,—or, if not both, at least one, and that one usually the one in which the mortice is cut,—should be square. Consequently, in such a piece of work as a door, if there are mouldings or chamfers on the styles they are stopped before the point where each rail is framed. In much Gothic panelling, therefore, the sides that enclose each panel are stop-chamfered or stop-moulded, the top of the panel (*i.e.*, the bottom edge of the rail) is moulded, but the bottom of the panel, *i.e.*, the top edge of the lower rail, is very often splayed; and the system which we are all familiar with of mouldings mitred round a panel, was almost unknown in England till the sixteenth century; nor was it the practice to plant mouldings on as we now often do, or to make use of the projecting mouldings, called blockwork mouldings. Thus, you perceive, the blockwork of every panel was quite different from the framework of a modern panel in appearance. The panel also sometimes differed; it was often enriched by carving on it an ornament in relief. This ornament was very often what is known as a linen-fold panel,—a conventional sort of imitation of a piece of cloth nailed up on the panel, and extremely rich in effect in many cases.

Although curved forms made a large part of the stone architecture of Gothic buildings, the designers of joinery were very chary indeed of introducing them. Sometimes imitations of small arcades, cut out of not very thick stuffs, and similar small decorative features occurred, but, generally speaking, all the main lines of the joinery are straight, so as not to cut across the grain of the wood. In rich and elaborate work there is hardly any limit to the degree of ornamental work introduced, and here, of course, circular work occurs at times. Perhaps an example within reach will give you so good an idea of what was accomplished when joinery was employed as the ornament of a very rich building as the stalls in Henry VII.'s Chapel at Westminster Abbey,—a work executed just at the time when Gothic architecture was about to give way to the new style, and as florid and ornate as possible.

The general appearance, however, of even highly ornamental Gothic joiners' work is decidedly dignified, if not severe. The squareness and regularity of the leading lines, the frequency of the panels, and the smallness of the mouldings, all contribute to produce this effect. Much modern joinery has been done from designs made by men who thoroughly understand the old, and for our purpose some of it is as good as the old. For a good specimen of what I call the severe quality of Gothic joinery I think you may go to the New Law Courts, from Mr. Street's designs, where you will see in the wainscot fittings of the courts and other parts the style of the thirteenth century thoroughly well carried out. For an equally exact reproduction of the richest joiners' work of the fifteenth century I would ask you to go to the Houses of Parliament, especially the House of Lords, where you will see elaboration carried to an extent for which only a national work of that sort affords the opportunity.

The joiner's work, like that of the carpenter, was affected by the change of taste at the Renaissance, and was, I think, earlier and more



completely transformed than the mason's and carpenter's work. It is not an unusual thing to see in an Elizabethan Manor house, where the general forms retain a great deal of Gothic character, panelling in the hall and staircase, of thorough Classic design, and possibly a screen in woodwork (such, for example, as the one at Andley End) where imitations of Italian plasters, columns, arcades, and so forth are executed in wood, cleverly enough, and with excellent effect of their kind, but of a character entirely and totally different from that which a years' earlier, would have had. Something of this difference exists, indeed, between the roof of the Middle Temple Hall, and the wooden screen thrown across the lower end of the Hall to cut off a corridor. The roof we might call Transitional, the screen almost complete Renaissance.

The best specimens of English joinery after the sixteenth century are most of them largely indebted to the art of the carver for their effectiveness. St. Paul's Cathedral shows this both in the choir stalls and the woodwork of the library, and though the carving there is a miracle of skill and richness, and certainly combines consistently with the fabric, I doubt if the stalls at St. Paul's are as fine pieces of joiner's work, or as good artistically, as any similar piece of good Gothic stall-work; and I am quite sure that the general run of Renaissance joiners' work is less constructive, less thoughtfully designed, and, I believe, to most tastes, less pleasing and interesting than the Gothic.

Between the Mediæval and the revived Classic, or, as it might be termed, the imported Italian, there is a great border-land when work known as Elizabethan, Jacobean, or Queen Anne occurs, both in joinery for domestic purposes and in furniture. More than one of the lectures of this course seems likely to touch a little upon this, and this is a reason, if the length to which this paper has already extended were not in itself a sufficient excuse, for not entering upon what has a great deal of interest for us at the present day in connexion with the modern revival of Queen Anne work. Suffice it to say that in its combination of forms and ornaments drawn from various sources, this Transitional work often forces us to admire it even when we feel that much of its charm rises from its being irregular. Nowhere is such work more in place than in joinery, especially for domestic use; and a vast amount of picturesque effect is obtained at the present day by the use of joinery for dwelling-houses designed in close imitation of the old English and Anglo-Dutch work, to be even found scattered about in many parts of London that have not yet been modernised.

Under no circumstances would the time have allowed me to go much further in considering ancient joinery, and with your permission we will now break off and turn to the very latest chapter in the history of works in wood—a chapter which is perfectly new,—of special interest to us in this hall, and I sincerely trust of vital importance to the craft.

By the liberality of one of its members,—Mr. Harben, a member of the County Council for London,—the Carpenters' Company is enabled to offer a series of prizes especially for the encouragement of skill and design in joinery as art, and in carving. Our technical examination has been directed to science and practical knowledge in carpentry and joinery as *construction*, and remains so. This is a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years. For you it is an opportunity.

The prizes offered this first year are a first series, and there is a prospect that they will be carried further in the future if the designers and craftsmen of London and the country generally encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who may become aware of it, to respond to the invitation which is addressed to you by throwing yourselves heartily into the competition, and during the months between the present day and June preparing specimens of the best you can do.

The subjects proposed for prizes are, it is hoped, varied enough and suitable enough to give opportunities to many. The first is a hammer-beam in hard wood. In designing this, you will remember that it is to be in a horizontal position, to be seen from below at about 10 ft. from the eye, that the end of it is

free and projects, and the remainder is part of the framing of the truss of an open roof. If competitors guide themselves by old examples, as I hope they will, remember that the hammer-beam roof was used from during the fifteenth, sixteenth, and part of the seventeenth centuries, and that the details and carving must correspond with models within those dates. Of course, it is open to competitors to imagine a quite modern hammer-beam roof, and originate a modern treatment; but this is a very much more difficult thing to do even tolerably well.

Whatever period is chosen, such mouldings as are introduced should be such as will be seen from below, and will be effective when looked up to, and at 10 ft. distance. Carving is, I think, only appropriate at the fore-end of the beam; but here a fine opportunity is offered to the carver, and the competition will no doubt turn mainly on the skill with which this is designed and executed, and adapted to the situation and the height, and also to the material, not forgetting that it will be one of a series, and so must have an outline that will bear repetition. It will make the hammer-beam more complete if it is morticed for the brace and post, and that should tenon into it; and if any of its mouldings are to mitre with those on the brace, for those on the hammer-beam to be properly cut.

The pieces of barge-board and finial are, of course, intended to occupy the apex of a roof of, at least, a two-storey building. There is very great scope for variety of design in this subject. The examples begin in the fourteenth century, and barge-boards have continued in use to the present day. Some are cut, some only moulded, some pierced, a few partly carved. The finial is always moulded, and gives a good opportunity for design and for skilful execution.

A bench-end is a comparatively familiar subject. What, of course, is meant, is one of more or less ornamental character. It is difficult to point to many good old Gothic ones in London, but very many modern ones of excellent design and execution are scattered about our best churches, and in Wren's and Gibbs's churches specimens of Renaissance, designs are to be met with. In dealing with this subject, it is to be hoped that the competitors will remember that it is the whole thing, not the bits of ornamental carving which they will introduce, that will be considered. Good outline, good proportions, good mouldings, as well as good execution of skilful carving will, accordingly, each play a part.

A table-leg presents the peculiarity that it is looked down upon. It requires both to be strong and to look strong. The great risk in designing it is making it clumsy or common-place. It is not a subject into which it is easy to introduce carving successfully, for as soon as the leg begins to look as if it has to carry the carving, it begins to lose the look of carrying the table. Good enrichments to mouldings are free from this danger, however.

A frieze is pre-eminently a carver's subject, and demands a knowledge of the nature of surface ornament, and power as a designer and carver. The work must be very good, because it is to be opposite the eye, but it must not be extraordinarily delicate, because it is to be executed in soft wood. In such a subject, if animals or figures are introduced, they add extremely to the effect if they are well done; but if the carver is not sufficiently skilled in this branch of his art, he had better not introduce them.

A bracket is, perhaps, almost more than anything else an open subject. Usually it is so treated as to be carved work entirely, but it may quite as appropriately be exclusively moulded, or a combination of the two. Remember that, however managed, the idea of support must not be lost, or the bracket is a failure.

The prize for a chair of moderate value offers in some respects the best opportunity to a man of genius. All the other subjects are, more or less, of an ornamental nature, and offer considerable scope for elaboration. Here the subject is familiar. The limitation of cost shows that the article must be a useful one, and that its excellence must be in itself rather than in its ornaments. At the same time, it is quite possible for a skilful man to improve upon the ordinary chair; and it is very probable that if he really does so, his design may have a success outside the walls of Carpenters' Hall.

There is one prize which is intended to be won by skill and readiness in designing and

drawing. The competitors will be set a subject unknown to them till they enter the examination-room, and will have two hours in which to do their best with it. No limitation is set as to what drawing materials are to be used, and you will note that competitors are to bring their own. Probably the best for such work is tolerably soft pencil. Of course, I have no clue, and can offer none, as to what the subject will be; but it seems to me that it will be likely to be of the same general description as the specimens of work,—that is to say, something requiring good joinery and admitting good carving; and, of course, its merits will be judged as a piece of artistic design and draughtsmanship. Last, but by no means least, there is a prize for beginners in the art of carving in wood.

In closing these remarks, and with them this lecture, I have only to express very earnestly the hope that there may be a very good competition for each of these Harben prizes, and my conviction that to win any one of them is likely to do good to the successful competitor by bringing him into notice. The judges will award no prize unless they are satisfied with the work, and will not be desirous, so far as I can foresee their intentions, to admit or pass anything that is bad or indifferent. In the construction examinations a very high standard was set last year, and will be maintained this year; and there is no reason why the same thing should not be done in the adjudication of the art prizes, and every reason why it should be done. To take a prize here will, therefore, be creditable and honourable to the successful candidate, and on this account, quite irrespective of the money value of such prize, will be, I venture to predict, of advantage to him in his career in life.

#### ARCHITECTURAL ASSOCIATION VISITS.

The first visit of this Association to works in progress during the present session was made on Saturday last to Palace Court, Kensington, a new building estate in the Bayswater-road in process of development by Messrs. Daw, Jowitt, & Co. The first building visited was a private residence in course of erection by Messrs. Macey, from the designs of Mr. Leonard Stokes. The house is carefully planned, and, although of small cost, provides a considerable amount of accommodation. The principal rooms are lighted from the front and back of the house, while an internal area gives light to bathrooms, lavatories, cloak-room, and stair. The dining-room and morning-room are on the ground-floor, the drawing-room on the first, and the kitchen and offices in the basement. A peculiar feature of the house is the lowness in height of the windows and the considerable space of wall above them. This, we understand, is due to the express wish of the architect's client, and certainly adds very largely to the piquancy of the design, both internally and externally. In order to avoid the accumulation of foul air in the upper part of the room, ventilators will be inserted in all chimney-breasts. The exterior of the house is carried out in red brick and white stone, with red tile roof.

The members next visited a new block of buildings containing residences in flats, known as Palace Court Mansions, and erected by Messrs. Daw, Jowitt, & Co. There are two residences on each floor with a central stair between, each residence being L-shaped on plan, and containing nine rooms besides kitchen, scullery, larder, butler's pantry, wine cellar, bath-room, &c. Not only are the rooms well lighted, but the corridors also. A hydraulic lift, adjoining the principal stair, is provided for the use of tenants, and service lifts are also provided in connexion with the servants' stairs and close to the tradesmen's entrance to each suite.

#### ARCHITECTURAL SOCIETIES.

Royal Institute of the Architects of Ireland.—The monthly Council meeting of the Royal Institute of the Architects of Ireland was held on the 4th inst., at 37, Dawson-street, Dublin, Mr. Thos. Drew, Fellow, in the chair. Other Fellows present—G. O. Ashlin, W. M. Mitchell, J. L. Robinson, J. R. Carroll, Albert E. Murray, J. J. O'Callaghan, Sandym Symes. The Hon. Secretary, Mr. Albert E. Murray, read the minutes of the last meeting, which were signed. A letter was read from the Secretary of the Royal Institute of British Architects again pressing the R.I.A.I. as



to the suggested alliance with that body, and referring to certain rules, which, unfortunately, not having been received, the matter had to stand over. A deputation of Master and Operative Plumbers was then introduced by Mr. Wm. Baird, master plumber, Abbey-street, who said that they sought the support of the architects of Dublin to enable them to get registered under the Worshipful Company of Plumbers, London. Their idea was to hold examinations on the standard laid down by that Company and to appoint boards of examiners and hold examinations throughout the country, thus to improve the plumbing trade, no one after a certain date being registered without passing such examination. After a long discussion the deputation withdrew, and the following resolution was proposed and carried:—"A deputation of Master and Operative Plumbers having waited on the Council of the Royal Institute of the Architects of Ireland to explain the extension and scope of the proposed National Registration of Plumbers, and informed us that the movement had the support of the trade generally throughout the Kingdom, resolved—That the Council desire to express its sympathy with approval of the object of the movement as one in which architects are specially interested, and trust that it may be attended with practical results."

**Birmingham Architectural Association.**—At a meeting of this Association, held at Queen's College, on the 5th inst., Mr. Ward read a paper entitled "Decorative Art and Fashion," in which he spoke of the present art revival as more due to fashion than to real appreciation of art, giving as proof of this the excessive desire for new and startling effects in manufactured articles, and the "en suite" furniture, with its chairs and mirror, capped by a pediment, merely because a pediment is part of the wardrobe, and the works of the amateur who delights to paint, sometimes well, but always inappropriately, tambourines, sabots, and mirrors. Mr. Ward, speaking of the present tendency to decorate by ornament rather than by form, expressed a fear of a fashion arising for rococo work, which, combined with the demand for cheap goods, must have a bad art influence, and pointed out the damage done by the desire for newness in design, instancing the painting of landscapes on the hearths as an unsuitable decoration of a thoroughly good material, and the adoption of the ingie nook fireplace in small houses as an absurd attempt to copy a better class of work. Having noticed with regret that many wall-papers were now emphasised in parts so as to produce the brain-bewildering patterns so recently condemned, and that decorators appear to delight in bringing into prominence the least important parts of mouldings and ornaments, Mr. Ward closed his paper by reminding his hearers that truly artistic work could not become "old-fashioned," and that the best art teaching for the masses was to show that the best art fitness of a thing for its work was the basis of all true art. Among those who were present and took part in the discussion raised on the paper were Mr. T. Naden (president), Messrs. W. H. Bidlake, W. N. Gething, J. Cotton, T. W. F. Newton, and H. R. Lloyd (Sec.).

**Northern Architectural Association.**—On Tuesday evening last the second meeting of the winter session of this Association was held in the Castle, Newcastle. Mr. E. J. Hansom presided, and there was a fair attendance. The Chairman, in the course of a few remarks to students upon the R.I.B.A. Examination and architectural education, said he felt most strongly that every student should keep the question of the Examination before him, and direct his studies to it with the view of passing. There was a great benefit to be derived by the student himself from the Examination, and upon it would depend the estimation of his professional brethren. The Royal Institute had made it imperative for students to pass the Examination, and from that fact he anticipated great results. Mr. W. H. Dunn also spoke in commendation of the Examination, and counselled the students to give the necessary study to the duties of their profession. Mr. Arthur B. Plummer, A.R.I.B.A., read a paper entitled, "As to the planting of trees in streets, and the different effects obtainable."

**Edinburgh Architectural Association.**—At a meeting of this Association, held on the 7th inst., Professor G. Baldwin Brown presiding, a paper was read by Mr. John Honeyman, F.R.I.B.A., Glasgow, on "Glasgow Cathedral."

After referring to the architectural features at considerable length, Mr. Honeyman said that there were two thoughts which naturally occurred to anyone who had carefully examined the Cathedral. One was the greatness of the resources of the country in building appliances and skilled labour during the thirteenth century. A good deal had been said about lodges of masons going from one part of the country to another, and settling down to work on one building after another; and that had rather fostered the idea that masons were few in number, and that, therefore, very few of the buildings could have been erected at the same time. They knew, however, that a great many were erected at the same time, and there seemed every reason to believe that the workmen were Scotchmen. What they did find clearly indicated that the men were not independent of what might be called architectural supervision, and it was much easier to imagine that identical details, executed at the same time in different localities, were designed by one and the same person, than that they were the portentous evolution of independent craftsmen's art. That led him to the second thought—viz., that such a structure as the choir of Glasgow Cathedral bore internal evidence that it was designed from base to parapet by one man, and that very little more was left to the discretion of the thirteenth-century mason than they were in the habit of leaving to the masons of the nineteenth century. In concluding, reference was made to the twist in the choir wall near the south-east corner, which was causing serious anxiety, and the hope was expressed that prompt measures might be taken to ensure the stability of that part of the building.

#### CROSS-RIVER COMMUNICATION ON THE CLYDE.

WE have made reference in another column to a novel scheme, patented by Messrs. Bell & Stoney, for a ferry-boat which is designed to raise itself by hydraulic power to the required level for discharging its cargo or passengers on the quay on each bank of the river. The following description of this invention is given in the *Glasgow Herald* of the 9th:

"The main feature in this system is the raising of the ferry steamer bodily to the quay-level by means of a large hydraulic ram built into the hull, and taking its purchase on the bottom of the river. The steamer itself, therefore, while receiving and discharging its load is supported firmly at the required level without being subjected to any surge or alteration of tide-level in the river. In this way, instead of having the usual works at the quays on both sides of the river, the ferries themselves are designed to do all the work. The vessel is capable of carrying 60 tons, exclusive of passengers, and is arranged for horse and passenger traffic and for railway trucks. It is propelled by a pair of twin-screws worked by separate engines. Built into the centre of the boat, and incorporated with its structure, is an inverted hydraulic cylinder of steel, in which works a ram 2 ft. 2 in. diameter. In the bed of the river is sunk an iron cylinder filled with concrete, and having on the top a conical cap of steel. This foundation cylinder is placed so as to be directly under the hydraulic ram when the vessel is at its berth.

When the vessel reaches the quay-wall the power of her engines is used to work powerful force-pumps which drive the hydraulic ram down upon the cylindrical foundation, and raise the ferry-ship to the height required. The bottom of the ram has a cavity into which the conical cap fits, which keeps the ram firm. To ensure the stability of the vessel when being raised and lowered, and to steady it when it is standing in its elevated position, there are built into the quay on each side guide-pillars of iron, and securely fitted to the vessel are blocks wrought by hydraulic power. When the vessel has reached the wharf these blocks are forced into the recesses on the pillars, and by an automatic arrangement the ferry-boat cannot be raised until these guide-blocks are thrust into the guides, which effectually prevents any risk of accident from carelessness of the man in charge of the lifting machinery.

The vessel discharges her cargo of passengers and vehicles, and immediately on receiving her return cargo is lowered into the water and the guides unshipped; she then proceeds on her journey across the river. The vessels could be

fitted with the electric light, which would enable them to work at night as easily as during the day, and also in foggy weather."

#### CLERKS OF WORKS' ASSOCIATION OF GREAT BRITAIN: ANNUAL DINNER.

THE sixth annual dinner of this excellent and flourishing Association was held at the Holborn Restaurant on Monday evening, when about 250 sat down to table. Mr. John Slater, B.A., F.R.I.B.A., was in the chair, supported by Messrs. H. D. Appleton, T. F. Franklin, J. Osborne Smith, T. F. Rider, J. Randall, A. Ritchie, J. Wilkinson (President of the Association), J. Brady (Editor of the Association's Journal), F. Dashwood, hon. sec., and many other gentlemen well known as friends of the Association.

The usual loyal and patriotic toasts having been given from the chair (Mr. J. Atchison responding for "The Army, Navy, and Reserve Forces"),

Mr. G. Dalton proposed "The Architects," saying that he was glad to know that many prominent architects, both in London and in the provinces, took a very lively interest in the welfare of the Association. With the toast was coupled the name of Mr. Herbert D. Appleton, F.R.I.B.A., President of the Association.

Mr. Appleton, in responding, said that architects owed a great deal to the clerks of works. Indeed, how they would get on without them in this country he did not know. But, judging from a letter he had lately received from Mr. R. W. Gibson, the architect of the new cathedral at Albany, the clerks of the works were practically unknown in connexion with American building operations. In consequence of his non-existence in the States, it appeared that architects who designed important buildings often declined to carry them out, owing to the difficulty and responsibility of giving them adequate supervision without the aid of a clerk of works. Mr. Gibson had written to him asking for information about the English custom of employing clerks of works on important buildings, and Mr. Dashwood, the hon. sec. of the Association, would no doubt be able to afford all information on the subject. In conclusion, Mr. Appleton said he hoped that the architects of this country could always have at their command the services of so able a body of men as those who were comprised in this Association.

The Chairman, in proposing the toast of the evening, "The Clerks of Works' Association," said that for an institution which had, so to speak, not yet cut its wisdom teeth, the very large gathering he saw before him showed very plainly that the Association had supplied a great need, and that its executive were men of great energy and ability. He did not know who was the founder of the Association, but he was quite sure he had a very prescient eye for the needs and requirements of those persons who constituted its principal members. It would be hard, he thought, to find a more practical body of men than clerks of works. The objects of the Association, as defined in the rules, were—(1) To advance the general knowledge and capabilities of the members, and to maintain their respectability and integrity; (2) to assist the members who might be seeking employment to obtain suitable appointments as clerks of works elsewhere; (3) to establish a circulating library for the use of the members, and to publish a journal devoted to the interests of the Association, containing papers, reports, &c., written by members and others, for circulation amongst themselves, and in any other way that might hereafter be found desirable, to neutralise, as far as possible, the disadvantages of enforced isolation under which many clerks of works now labour. Mr. Slater then dealt with the various duties which devolved upon the secretary, and said the Association had been asked for, and most ungrudgingly granted, their aid in assisting the superintendence of the technological examinations which had been instituted by the Carpenters' Company. He regretted that Mr. Stanton W. Preston, the Clerk of that Company, was not present, but if he were he knew he would endorse his observations when he said that the presence of the President of the Association on the board of examiners—of whom he (the chairman) had the honour of being one—had been of incalculable value to those examinations (hear, hear). He, as an architect, was only too pleased to be of any assistance to the members of the Association of Clerks of Works, because having a clerk of works who was incompetent and not trustworthy was worse than having none at all (applause).

Mr. J. Wilkinson, the President of the Association, replied, expressing his acknowledgments for all that had been said in praise of the Association and its work.

Mr. J. Brady next gave "The Honorary Treasurer" (Mr. J. Oldrid Scott, F.R.I.B.A.), and Mr. R. Wheeler responded to the toast, in Mr. Scott's absence. Both gentlemen spoke of the

• Mr. J. Macvicar Anderson, hon. sec. to the Royal Institute of British Architects, had been announced to take the chair, but was prevented from doing so, we regret to hear, in consequence of a heavy domestic bereavement,—the death of his eldest son. Mr. Macvicar Anderson will have the sympathy of all who know him.



great encouragement and help the Association had received from Mr. Scott in its earlier years.

Mr. F. Dashwood, the hon. sec., proposed "The Worshipful Company of Carpenters," and referred to the good and useful work done by that Company for the advancement of technical education. The Company had very kindly allowed the Association to hold its meetings at their hall—a boon for which the members could not be too thankful. Mr. Dashwood, in dwelling upon and enforcing the need for increased technical education amongst young workmen, referred in characteristically ready and humorous terms to the constructive marvels and the misapplied ingenuity so often to be noted by visitors to workmen's or "industrial" exhibitions (especially in regard to work done by amateurs) or men belonging to other trades than those properly concerned in the exhibits referred to, deducing the moral that such ingenuity and assistance, if trained and developed under proper guidance, might be made really productive and useful. With the toast was coupled the name of Mr. Thomas F. Rider, in the unavoidable absence of the Clerk of the Company, Mr. Stanton William Weston (applause).

Mr. Thomas F. Rider, in replying, said that he thought the Carpenters' Company deserved every word of the approbation which had been expressed. Like other City Companies, it had done its very best to promote the cause of technical education. They had at Stratford a valuable workshop where boys were taught carpentry and plumbing, and other cognate trades. The Joiners' Company, and the Tyllers and Bricklayers' Company, had also considered the value of technical education in a practical manner. The City companies could not better use their wealth than in forwarding that cause in which they all had so much interest (applause).

The next toast was "The Surveyors," proposed by Mr. T. F. Rider, and coupled with the name of Mr. T. F. Franklin (Franklin & Andrews), who, in responding, said it behoved builders to see that they did not tender upon improperly prepared bills quantities, the work of incompetent men, who ought discredit upon the profession.

The other toasts were "The President, Vice-President, and Committees" (proposed by Mr. John Weston and responded to by Mr. Linn Dillon, co-President); "The Press" (proposed by Mr. Lawrence and associated with the name of the representative of the *Builder*); "The Visitors" proposed by Mr. F. A. Hocking and responded to by Mr. A. Ritchie, of the firm of Steven Bros. & Co.; and "The Chairman" (proposed by Mr. J. Redden).

#### NEW BUILDINGS FOR ST. PANCRAS' WORKHOUSE.

SIR.—In common with many of my fellow guardians, I was surprised to see Mr. Bridgman's plans for the rebuilding of the St. Pancras Workhouse published in your last issue, leading your readers to believe that the work of reconstruction had been entrusted to him. I think it right to inform you that no arrangements have been made with any architect at present, and that the matter is still under discussion.

A ST. PANCRAS GUARDIAN.

Feb. 12, 1889.

\* We are somewhat more than surprised to receive the information given in the foregoing letter. We did not consider the illustration of any value or interest architecturally, and we accepted it, after some hesitation, as a sign for a large building which was to be erected, and which, therefore, might claim public notice; and Mr. Bridgman's communications in regard to it conveyed that impression.

#### BRIDGING THE CLYDE.

SIR.—I have read with interest your article on the Bridging of Navigation Ways, which appeared in the *Builder* last week, and which debases some of the numerous methods lately proposed for affording further communication across the River Clyde.

I noticed, however, that in referring to Mr. O'S scheme for a high-level bridge, the clearance of which would be 460 ft., and which allows a head-room of 100 ft. above the quay level, you wrote that "traffic would ascend to it by an inclined way . . ." and that "it is very questionable whether if any but the stoutest-hearted of traffic would prefer these killing inclines to the longer, less-exacting, road round *via* Glasgow Bridge." I am, I think, justified in assuming that you refer to the Jovan Ferry.

Now the principal feature in the design is that the great bulk of the traffic, both vehicular and pedestrian, would not require to use these inclined approaches at all, but would be raised to the level of the bridge, and, after passing over, would be lowered to the quay, by hydraulic lifts, for which some eight are proposed, but the number can, if necessary, be increased.

By the use of the inclined approaches, which rise 20, it would be possible to cross at any hour of

the day or night, free of tolls; but it is only thought that the lighter class of vehicles will adopt this means of transit.

Stairs for foot passengers will be provided at each end of the bridge, in addition to the lifts, and also at other convenient places along the approaches.

As the bridge would have a clear width of 60 ft., it is not necessary to compare its capability of dealing with the great traffic with that of the tunnel scheme described by you in your last number, and for which the use of hydraulic lifts are equally necessary.

Forth Bridge Works.

J. E. TUIT.

#### The Student's Column.

##### TOWN DRAINAGE.

##### VII.—INTERCEPTING OR DISCONNECTING TRAPS.

THE traps last mentioned are water-traps. Another kind is the flap-valve, which is supposed to act, but does so very inefficiently, as a trap in preventing the passage of air while permitting the passage of sewage in the opposite direction. The iron door is hung in an earthenware block, which contains the faced end of the pipe, and the door should also be faced to fit closely against it; but at present we shall refer only to water-traps. After a proper junction has been made with a sewer, the next thing which demands attention in a house-drain is whether a trap shall be placed upon it to break the continuity of the air space in the line of pipe. If such a trap is to be so placed it should be as near the sewer as possible, the object being to disconnect the air in the drain from that in the sewer. It should be effected as completely as possible by placing the trap near the sewer, because the air in whatever length of drain may be thus cut off at its lower end must remain almost dead, or with but little movement in that length, and the longer the same air remains in contact with sewage the fouler it becomes, and the uncertainty whether a part of its concentrated foulness may not escape into the street at the nearest opening makes it desirable to at least limit the length of drain in which such a state of things is possible.

In dealing with the air of sewers and drains the safest general plan is to dilute it as abundantly and as soon as possible with atmospheric air, whereby its noxious properties are overcome and practically destroyed. But it is a condition that the place of introduction of the foul air into the atmosphere should not be at the ground level, but as high above it as possible. That object is attained by leaving the mouth of the drain open and trapping every other opening upon it except one, at its upper extremity, and continuing that opening vertically upwards to a point above the roof, circumventing the place, so that the exit of the air be not near a window. In short, doing the best that can be done in a common-sense way; at the same time not ignoring what science has discovered of the properties of the air, both of sewers and the common atmosphere, chemically and biologically. Upon this understanding a ventilating pipe or shaft is erected at the head of every house-drain, nearly, if not quite, of the full diameter of the horizontal part of the drain. Where a water-closet is situated far back on the premises and above the ground floor, the soil pipe is continued vertically upwards of the same diameter, and serves the purpose of the necessary ventilating pipe, if it is desirable to save the expense of a special pipe for this purpose, and if the situation be not prohibitory.

Wherever the situation may be, it should never be attempted to ventilate a house-drain by means of a small pipe. Nothing less than 4-in. diameter is sufficient, and this barely so; 5-in. or 6-in. for a special pipe is much better. The larger the pipe the better its effect, because the air passing through the pipe passes more easily. Air can only be induced to flow in a pipe of this sort by creating a difference of pressure in the air at the two points of entry and exit. It may be done by a surplus pressure applied at the entry, at or near the ground level, or by carrying the pipe up to such a height that the natural difference of pressure in the atmosphere at the two heights above the same datum level will be sufficient to create the desired current; or, again, it may be done by the effect of heat in the upper part of the pipe, derived either from the sun or from the warmth of the interior of the house, or by warming the upper part of the pipe by any means whatever.

The first-named method,—that of applying a surplus pressure to the air at its entry into the drain-pipe,—may be adopted in a few cases, but not so in many, and it cannot be regarded as a practicable method of creating a current of air through the drain and the vertical soil-pipe, or any special ventilating pipe. The heat of the sun is beneficial when the soil-pipe or the special pipe is outside the house, and exposed to the direction of the sun's rays; but when it is in a position shaded from the sun, it is better inside the house than outside. Whatever position may be chosen for it in each separate case, and whether a special ventilating pipe be erected or the vertical soil-pipe of a water-closet be used for the purpose, the object to be attained is to create a continual current of air through the main portion of the drain, from its lower end upwards. There can in no case be any strong current, and none is necessary; a gentle movement of the air is sufficient. A very small part of the area of a 6-in. drain-pipe is occupied by sewage, and the cross sectional area of the airway may be taken at 20 square inches, or say  $\frac{1}{4}$  square foot, and the surface with which the air flows in contact may be taken at 15 ft., multiplied into the length of the drain. The longer this is, the more obstruction the pipe offers to the free passage of air through it; but supposing the length to be 100 ft., and that a movement of the air at the rate of 1 ft. per second be ensured, this will be an efficient ventilation, and may be effected in most cases by the difference of temperature between the air in the drain and that in the ventilating-pipe. A metal pipe,—preferably of iron, as a better conductor of heat than lead,—has this effect in most cases. We may, however, leave out of consideration at present the details of this matter, and of whether the pipe should be inside or outside the house; for these details do not affect the main principle of placing an intercepting trap in the drain near the sewer.

But if a free inlet of air be prevented entering the drain at its mouth, another inlet must be provided, otherwise the air in the drain would be shut up, would become excessively foul, and probably most dangerous to the inhabitants of the house; for although all openings but one would be trapped, one of the trapped openings might become untrapped by accident or neglect, and if a communication were thus made with a long length of drain containing this foul air, rendered extremely foul by long contact with sewage, it would make the state of things worse than it could have been without any drain at all. Therefore, the intervention of a trap such as that we have referred to, renders it absolutely necessary to counteract the effects of its obstruction by placing alongside it an inlet for air, the inlet being, of course, on the house-side of the trap. It is so directed in the Model By-laws issued by the Local Government Authorities in framing their by-laws under the Public Health Act, 1875, and the other statutory provisions which, by the operation of that Act, are rendered applicable to their respective districts. It is therein proposed that, with respect to the drainage of buildings, "Every person who shall erect a new building shall provide, within the curtilage thereof, in every main drain or other drain of such building which may directly communicate with any sewers or means of drainage into which such drain may lawfully empty, a suitable trap at a point as distant as may be practicable from such building, and as near as may be practicable to the point at which such drain may be connected with such sewer or other means of drainage." And, "Every person who shall erect a new building shall, for the purpose of securing efficient ventilation of the drains of such building, comply with the following requirements:—He shall provide at least two untrapped openings to the drains, and, in the provision of such openings, he shall adopt one of the two following arrangements:—One opening, being at or near the level of the surface of the ground adjoining such opening, shall communicate with the drains by means of a suitable pipe, shaft, or disconnecting chamber, and shall be situated as near as may be practicable to the trap, which, in pursuance of the by-law in that behalf, shall be provided between the main drain or other drain of the building, and the sewer or other means of drainage with which such drain may lawfully communicate. Such opening shall also in every case be situated on that side of the trap which is the nearer to the building. The second opening shall be continued



by carrying up from a point in the drain, as far distant as may be practicable from the point at which the first-mentioned opening shall be situated, a pipe or shaft, vertically, to such a height and in such a manner as effectually to prevent any escape of foul air from such pipe or shaft into any building in the vicinity thereof, and in no case to a less height than 10 ft."

But if in any case this cannot be done, the alternative is offered of reversing the current of air flowing through the drain, and, instead of its entering the drain through an opening formed in conjunction with the intercepting or disconnecting trap, and passing upward through the drain to a ventilating pipe to be erected at its farther end, the opening at the ground-level may in this case be made at the far end of the drain, and the ventilating-pipe may be carried up vertically at or near the intercepting trap, on, of course, its upper side, or that nearest the house. The ventilating-pipe is in that case carried up the front of the house, or at a gable end in some situations which admit of it. The opening at the ground-level, whether at the lower or the upper end of the drain, made for the entry of fresh air into it, must be covered with an open grating. It is provided in the Model By-laws that in either of the arrangements above described the soil-pipe of any watercloset may be adopted as the ventilating-pipe if the situation, sectional area, height, and mode of construction shall be in accordance with the requirements applicable to the pipe or shaft to be carried up vertically as an outlet of the air admitted at the ground-level, in either of the arrangements above-named. It will be sufficient, perhaps, to describe more in detail the first one only, the other being but little more than a reversal of it.

### Books.

*The History of Little England beyond Wales, and the non-Kymric Colony settled in Pembrokeshire.* By EDWARD LAWS. (London: G. Bell, 1888.)

**L**ITTLE is a bold man who in these days essays anything in the shape of a county history. From a commercial point of view it is a hazardous undertaking, but scarcely less so from a literary point. There is such a plenitude of material,—much of it only just made available,—and such a distribution of knowledge among specialists, that the work has become more and more formidable. The county historian of the last generation gave his attention merely or chiefly to the descent of property and of families connected therewith. Genealogy was his strong point, and the gentry, whose pedigrees he recorded, were his main supporters. If he thought it desirable to say anything about the fauna or flora of his county, he usually got some one to write the account for him; and as for the far-off past,—the pre-historic era,—it was regarded by him as a region in which he could wander at will, and as he picked up a fossil, a celt, or other implement, give the reins to his fancy and indulge himself in speculations of the wildest kind.

Mr. Laws has been wise in restricting his historical researches to a comparatively limited area, and he has certainly brought to bear upon it not a few of the requirements of a historian. He has a genuine interest in his subject, great industry, much local knowledge, and a wide range of reading. There is also a certain freshness about his style which is attractive, and he is not content to accept the theories of other people. He has his own views, which he advances boldly, and supports with shrewdness. Whether he has succeeded in unravelling the network of fact and tradition which involves the earlier history of the Kymry is another matter. He has, at any rate, collected a vast amount of evidence from the poetry and legends of the race or races which occupied the land, and we confess to feeling ourselves quite incompetent to pass judgment upon its value. It will be enough for our purpose to state that the term "Little England beyond Wales" is applied to the southern part of the county of Pembrokeshire, in which the English language is and has been spoken time out of mind. It is divided not only by language but by marked physical and ethnical barriers from the Welsh-speaking portions of the same county. While it would be an exaggeration to say that the dwellers in the English colony have no dealings with their Welsh neighbours nowadays, it is still true that they seldom intermarry with

them, and that they are pleased to regard themselves as a "peculiar people." As to their descent, we can assign them no remoter ancestry than the Norman and English invaders of the eleventh century; but the race which occupied South Pembrokeshire at the date of this invasion was a mixed one, in which the Scandinavian element preponderated, and therefore the invaders would have an unusual amount of affinity with those amongst whom they settled, and would readily find a home there. In the following century a Flemish immigration into West Wales took place, and a considerable number of Flemings established themselves in Pembrokeshire and the adjoining district of Gower. Their presence cannot be traced in the language of the district, but it has been customary to assign to their influence certain peculiarities in the construction of church towers and of chimneys. On these points Mr. Laws is sceptical. The so-called Flemish chimneys,—massive erections, some angular, some round, standing on a square or circular base,—do not belong, in his opinion, to an earlier date than the fourteenth century. He also affirms that they are to be found in other parts of Wales, but whether they are to be seen in Flanders he does not inform us. To the Flemings he attributes an advance in agriculture and the introduction of a certain implement,—the long-handled, heart-shaped shovel,—peculiar to Pembrokeshire, Belgium, and Ireland. It doubtless reached the latter country through Pembrokeshire, which was in constant communication, hostile or friendly, with Wexford and Waterford. But whether the impress left by the Flemish colonists in South Pembrokeshire has been distinct or the reverse, there can be no question that the Norman invaders took good care not to be forgotten. They were emphatically builders of castles, and no district in Great Britain, with the doubtful exception of the Scottish Border, is more rich in specimens of military architecture than Little England beyond Wales. Pembrokeshire Castle dates back to the year 1090, though its grander features must be referred to a century later. Manorbier, the most picturesque fortress in South Wales, was at least founded by Gerald of Windsor, and within its walls was born, in 1146, the delightful gossip known as Giraldus Cambrensis. He describes, with evident pride and pleasure, the home of his childhood,— "the castle excellently well defended by towers, outworks, and situated on the summit of a hill. On the western side it extends towards a haven of the sea, and has on its northern and southern sides, beneath its walls, a fine fish-pond, as conspicuous for its beauty as for the depth of its waters." The fish-pond on the northern side may still be traced, but the existing walls and towers (preserved from further decay by their present occupant) belong in the main to a later period,—perhaps the end of the thirteenth century. Carew Castle, which underwent a thorough transformation in Tudor times, and lodged King Henry VII. on his way to Bosworth Field, had the same founder as Manorbier. Tenby, lying to the east and forming the last member of the quadrilateral (within which, Mr. Laws says, no Welsh would dare to venture), had also its castle, but the existing remains are too insignificant to admit of forming any trustworthy opinion of its character. The little round tower which still crowns the summit of the Castle Hill may have been part of the original structure, but its position and dimensions suggest that it was chiefly employed as a beacon-tower and point of observation. Outside this series of fortresses there was a chain of castles, varying in strength and importance. Chief among them was Haverfordwest, whose traditional founder was Magnus Maximus, and actual builder Gilbert de Clare, the father of Strongbow. Of the rest we can only mention Llanstephan, Llawhaden, Narberth, and Pictou. But the military occupation of Little England was not dependent only upon castles; nearly every church tower was a stronghold of considerable height and extreme massiveness. The latter characteristic is very striking, and, combined with the rough corbel table and embattled parapet, suggests military uses, and sometimes a greater antiquity than a closer scrutiny would sanction. In fact, Mr. Freeman warns archaeologists against being misled by appearances. He thinks the type of tower was introduced at an early period, but was continued with little alteration to the latest,—from the first to the last Harry. Mr. Laws tells us that there is a local tradition that the Pembrokeshire church towers were built

after the model of a square bastion, with strongly battered base, which is still a conspicuous feature of Manorbier Castle, but one can readily account for the similarity without the aid of such a story. The same reasons which influenced the church-builders were felt also by those who had to build houses of residence. The fortified manor-house was common enough, and there is at least one example,—the old Rectory, Angle,—of what is common in Northumberland, namely, a "pele" tower, used as a dwelling by the parish priest.

We have been led into a notice of some of the architectural matter which finds a place in the pages of Mr. Laws's history, and it is only fair to add that this branch of his subject is very fully treated, and that the woodcuts, taken chiefly from the *Archæologia Cambrensis*,—are in the truest sense illustrations. Indeed, the same term may fitly be applied to most of the author's observations. They throw no inconsiderable light upon the annals of an interesting settlement, which has preserved certain characteristics through many centuries unimpaired.

*Country and Suburban Cottages and Villas: How to Plan and Build them, &c.*—By JAMES W. BOGUE, architect, Edinburgh. (Edin.: Robert Symon, 1888.)

**W**HEN the reviewer in the pursuit of his thankless calling takes in hand the typical thin quarto volume dedicated to the architecture of the rural cottage and the suburban villa, he knows from experience pretty well what is in store for him. A strong family likeness runs through all the members of the class, and their distinctive virtues and failings reappear with predictable regularity. The modest preface: the rhetorical introduction on the high functions of that art whose impartial touch transforms alike "the modest cot and the magnificent cathedral;" the friendly counsel on the selection of a site—high, dry, cheerful, sunny; conveniently near road and market—surrounded by the finest natural scenery and the best society; on the necessity for a foundation of assured integrity; a roof which shall firmly grasp the fabric, and be both wind and rain proof; on the advantages of solidity, comfort, convenience, and a pleasing exterior,—the best of everything, in short, and plenty of it; warnings against the fatal infatuation of the amateur and the pitfall which awaits him; and wise advice to employ on all occasions an architect of experience, &c., &c., &c., which, perhaps, his name is X."

Then come the pictures, beginning with the peasant's humble home, and rising in gradation to the ample villa of the retired tradesman, the sumptuous retreat of the successful merchant, and even the cottage ornée of those "vain lords of wantonness and ease," who desire such dainties, and can afford to pay for them. Each design is in turn fitted with an exposition of its peculiar artifices; an estimate always moderate, of its probable cost; and characters small and unassuming, but clearly legible, the name of its talented contriver.

This form of professional exercise is chiefly indulged in by young men of much energy and more leisure, whose honourable ambition it is to bring their "potential" before the world; and if such publications do not differ in principle from the tradesman's priced circular, they are not,—on the score of youth and its various exigencies,—to be too hardly dealt with.

For obvious reasons, and in spite of an assumption of encyclopedic knowledge, a somewhat nebulous atmosphere surrounds the purely practical portions of such essays, and sometimes there is, perhaps, a deeper motive for a convenient obscurity.

The caution that "stone walls should be of adequate thickness" may cover a hint that more exact information must be sought in the regular way; and the assertion that "brick walls in the basement story should be regulated with stone to prevent their splitting, a circumstance too frequently neglected" (1) may have been fully contrived to baffle the rash gazer into the mysteries of a craft from which he would base snatch a surreptitious advantage.

The work now open before us is in no respects superior to many of its predecessors. The elevations are, in the main, simple and suitable,—those in a modification of the "Scottish Baronial" manner being decidedly the best. We are spared the customary scrota perspectives, with the unblushing exaggeration, and suppressions, and the equipage of General Tom Thumb in the foreground; and were it



or the surprising injunction to "paint and sand the projecting (wooden) roofs to imitate stone" we should have little else but praise for this portion of the work.

However, the plans are, after all, the most important matter, and as the author avows that his chief study has been the internal arrangements of the houses designed by him, these we will address ourselves.

The first plate in the book is a design for a pair of "labourers' cottages," to cost £320. In the ground floor of each is provided a living room, 12 ft. by 12 ft.; a scullery, 8 ft. 6 in. by 7 ft. 6 in.; a porch, 4 ft. by 4 ft.; space for stairs, two cupboards, a pantry, a passage leading from the living room to the back door, and, outside the main walls, a coal store, an earth-closet, and ash-place. On the chamber floor are three bed-rooms, one 12 ft. by 12 ft. and a recess for bed, one 12 ft. by 8 ft., and one 6 ft. 6 in. by 7 ft. 6 in.

The living-room has four doorways opening to it,—one from the porch, one to the scullery, one to the passage, and one to the cupboard under the stairs,—and thus, with the fireplace on one wall and the window in the other, there is very little wall-space left for either furniture or fittings. The main entrance is opposite the fireplace and within 9 ft. of the hearth, and to the fireplace draughts from this and two other doors converge, sweeping with cold currents of air the whole interior of the little room. The scullery has no fireplace, and the only route from the yard behind is through the living-room. We cannot help thinking that a great many plans have been packed into a very small compass.

The house,—whether cottage or mansion,—is an agglomeration of separate apartments, and, the individual rooms are ill-planned, the general result cannot be satisfactory. Now we take it to be an axiom in room-planning that the door should, when practicable, be placed in wall at right-angles to that in which the fireplace is built, and as far from the fire as possible, the door being hinged on the jamb nearest the fire-place, leaving the body of the door free from the incoming blast of air. Moreover it is evident that in a small room, especially a few doors there are the more comfortable the room will be. Such an arrangement is quite feasible in the case under examination. The passage to the yard is clearly redundant, a mere occasion of unnecessary discomfort. Nor are cupboards or entrances necessary in so small a cottage. By throwing the passage into the scullery and making it a thoroughfare to the living-room, reversing the present order, both would be benefited. The scullery would be enlarged, and the only door into the living-room would be in its right place, leaving two cosy corners by the fire and plenty of useful wall-space. The labourer would enter his home by door and porch at the left-hand rear corner,—leave his tools and what not in the scullery or house on route,—wash, and enter clean and dry into his only comfortable room, which, no longer a thoroughfare-room, might be neat and warm. No cupboard or stair room need be sacrificed, and a warm, clean, and dry house would be obtained in place of one apt to be cold winds and made dirty by necessity. No such improvement can be suggested for the chamber floor, as to which we will merely remark, in passing, that a room of only 480 cubic feet, and without a fireplace, is not fit for even a child to sleep in if health is to be thought of.

Upon the right relation of doors and fireplaces the comfort of a room in the main depends, and, consequently, the general comfort of the house; and no part of the plan of the ordinary house receives so little attention. It is significant that the author does not allude to amongst the many subjects with which he deals in his prefatory matter, and there is in none of his plans (e.g., Plates 6, 10, 14) a notion disregard of this first necessity of successful planning. In Plate 22, the dining-room would be scarcely habitable.

We are glad to be able to congratulate the author on the design exhibited in Plate 26, except as to the lighting of the kitchen and of the passage to the upper w.c. If he had inverted this and reversed the stairs, entering the scullery from the hall instead of from the lobby, should have had nothing to complain of. Of course, an architect is very much in the hands of his client, and arrangements which the designer did not recommend if left to himself are sometimes forced upon him. But then he should put them in a book of examples of his skill.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

1,893, Door-springs. S. H. Ridge.

According to this invention, in a metal frame-work is enclosed a piston, around which is a strong spiral spring. At the end of the piston is an air-valve. The piston-rod is attached to a crank which works in bearings in the outer framework, and to an extension of the crank-rod outside the frame-work of the door. The piston works in swivel bearings, so that the door can be moved one way or the other.

3,012, Ventilation of Discharge Pipes. S. S. Hellyer.

According to this invention, one pipe or passage is employed, but this is divided, in section, into two, one pipe of which acts as a soil, discharge, or waste pipe, the other as a ventilating portion. At each junction of the syphon or branch pipe, a communication is made from the ventilating portion of the pipe or passage to the soil, discharge, or waste pipe; and this is so arranged that the passage is not entirely obstructed by air passing down the pipes. The partitions are made at such an angle, and in such position, that they overlap the lower edge of the part of the partition in the length of pipe or passage above it, but with a passage of air between. This prevents the liquid seal of the syphon from being drawn. The invention is applicable to all discharge or waste pipes in sanitary appliances generally.

3,155, Rain-water, Drain-pipes, &c. J. J. Lewen.

One end of the pipe which is the subject of this patent is provided with a packing of india-rubber, or similar elastic material, and with a shoulder or collar either attached to the pipe or sliding loosely thereon. The other end of the pipe is provided with a shoulder or collar of larger diameter. When joined, the two ends of the pipe are kept tight by the elastic packing, the shoulder or collar of the one being within the larger shoulder or collar of the other. The annular chamber between the two shoulders is filled with a watertight composition, which is put in hot, and which can be remelted and used again if requisite.

4,409, Ventilators. C. Brothers.

In order to increase the efficiency and utility of "hit-and-miss" ventilators, and to lessen their cost, on either the top or bottom plate two or more pins, working in suitable slots are, according to this invention, fitted. By this means, either the top or bottom plate can be moved to and fro as desired. In order to prevent dirt passing through the apertures of the ventilator when open, a small wire-gauze screen is fitted.

4,581, Casement Stays. P. E. Ayton.

To increase the gripping power upon the stay-bars the guide-box is made, by this invention, to swivel horizontally to the underside and within the middle of an attachment-plate secured to a door or window-framing. The underside of a screw, or screw-stem, is broadened out into an extended bearing or seat. Embracing the two opposite ends of the swivelling guide is an open-ended swivelling clip, and by screwing home the head or nut, the bar is gripped both by the screw and a saddle-clip.

3,882, Flushing Apparatus. J. Breeden.

In the cistern of the flushing apparatus a hollow cylinder with a disc or piston working in it is used by this inventor. The syphon has a flattened bend. A second or supplementary and smaller cylinder and piston and a small syphon for effecting a second and small flushing of the pan (after the principal flushing has ceased) is used. The arrangements for the principal flushing are modifications of those in general use.

3,695, Chimney-pot. R. Roberts.

The chimney-pot which is the subject of this invention is devised to prevent down-draught. A scalloped top or cover is provided, and the inner or underneath portion of this is formed bowl or concave shaped. The ascending smoke, instead of escaping direct into the atmosphere, impinges upon the underside of the cover, and is diverted downwards and out into the air. The pot is to be made in terra-cotta or in metal.

## NEW APPLICATIONS FOR PATENTS.

Jan. 28.—1,476, F. and D. Spence, Fire-resisting Materials.—1,485, J. Newcombe, Planing the Mitre of Picture-frames, &c.—1,520, J. Townshend, Structures built of Bricks.—1,532, Baron Franks, Fireplaces.—1,539, J. Ingleson, Construction of Window-sashes and Sash-fasteners.

Jan. 29.—1,577, A. Youlton, Sliding Windows.—1,580, T. Hill, Sash-fasteners.—1,613, A. Stevenson, Window Ventilation.

Jan. 30.—1,623, W. and C. Chandler, Automatic Flushing Cisterns.—1,630, E. Wassell, Syphon Flushing Cistern.—1,642, W. Crichton, Raising, Lowering, and Locking Window-frames.—1,654, G. Binks, Opening, Closing, and Fastening Fanlights, &c.—1,658, A. Withers, Sash-fasteners.

Jan. 31.—1,742, E. Done and J. Doring, Sash-fastener and Burglar Alarm.—1,765, L. Brentini, Roofing Tiles.

Feb. 1.—1,788, H. Hind and E. Jones, Window-stop and Fastener.—1,818, C. Stone, Chimney-cowls.—1,845, L. Wagner, Staircases.

Feb. 2.—1,863, C. Hall, Sliding Flush-bolt.—1,888, J. Cole, Ventilating-hook for Sash-frames.—1,874, D. Hooy, Revolving Cowls or Hoods.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

4,720, W. Shuffelbottom and T. Brown, Brad-awl, &c.—15,754, C. Hubbocks, T Squares.—16,770, C. Weber and F. Follows, Artificial Stone, &c.—17,460, E. Partridge, Securing Door-knobs to Spindles.—17,792, M. Ward, Electrical Street-car.—17,817, R. Batoy, Window Sash-fastener.—18,154, P. Wood, Door-lock and Fastenings.—18,273, T. Scarborough, Wood Screws.—18,325, T. May, Stop-hinges.—18,424, W. Wilson and W. Pirrie, Combined Deck-house, Slide-light, and Ventilator.—18,452, J. Rook, Locks.—18,456, S. Ingham and others, Wood-drying Chambers.—18,678, F. Jones, Preventing the Emission of Smoke from Chimneys.—18,697, R. Oakley and R. Pollock, Spray Nozzles for Ventilators, &c.—18,712, C. Wells, Electric Locks, &c.—18,742, J. Spence, Preservation and Fireproofing Wood, &c.—18,811, S. Hazeland, Wood-planing Machines.—19,037, T. Fraser, Exhaust Ventilator or Chimney-pot.—94, J. Hargreaves and others, Treatment of Lime, &c.—182, J. Brown, Sash-windows.—195, J. Greathhead, Tunneling Apparatus.—354, S. Fisher, Wall-hangings, &c.—379, W. Baker, Plastering-machines.—420, R. Scott, Bakers' Ovens.—522, J. Barlow, Raising and Lowering Windows.—581, J. Walker and T. Pogue, Lighting Private Dwellings, &c.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

1,507, R. Adams, Springs for Doors, &c.—1,873, J. Simpson, Raising Window-sashes, &c.—3,229, W. Scott-Moncrieff, Valve Water-closets.—3,385, E. Loftis, Stoves, Ranges, &c.—4,339, A. Caroy, Constructing Breakwaters, &c.—4,358, H. Walker, Hydraulic Lifts.—4,416, J. Pollock, Window Sash-fastener.—4,720, W. Shuffelbottom and T. Brown, Fastening Bits in Brackwells.—4,773, W. White, Tiles, and Method of Fixing Same.—5,247, De Penny-father and J. Drismore, Ventilating Rooms, &c.—13,526, J. Twitchin, Convertible Window-sashes.—15,411, W. and G. Heywood, Disinfecting Water-closets, &c.—15,478, A. Willgeroth, Heating and Ventilating.—16,620, A. Hopton, Windows.—17,460, E. Partridge, Securing Door-knobs to Spindles.—17,467, F. Chantrell and others, Screw-drivers.—18,330, G. Goffin, Union Joint for Lead Pipes, &c.—5, W. Andrew, Flooring Cramp.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

FEB. 4.

By WATERBURY &amp; SONS.

|                                                     |       |
|-----------------------------------------------------|-------|
| Hersham—A freehold villa residence .....            | £480  |
| Freehold house, yard, and workshops .....           | 3,385 |
| "Oak Lodge," with grounds, freehold .....           | 1,000 |
| A plot of freehold land .....                       | 370   |
| The lease of the "Old Cottage," term 16 years ..... | 125   |
| Two plots of freehold building land .....           | 700   |

FEB. 5.

By C. &amp; H. WHITE.

|                                                                                |     |
|--------------------------------------------------------------------------------|-----|
| Clapham-road—11, 12, and 13, Alfred-street, and a plot of land, copyhold ..... | 760 |
|--------------------------------------------------------------------------------|-----|

FEB. 6.

By D. J. CHATTELL.

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| Barnes—3, Bardowick-villas, and other erections, freehold ..... | 755 |
|-----------------------------------------------------------------|-----|

FEB. 7.

By A. BOOTH.

|                                                                |     |
|----------------------------------------------------------------|-----|
| Camden-road—No. 194, term 49 years, ground-rent £25 .....      | 885 |
| Kentish Town—30, Torbay-street, 40 years, ground-rent £6 ..... | 210 |

By WOODS &amp; SNEELLING.

|                                                         |       |
|---------------------------------------------------------|-------|
| Marylebone—Improved rentals of £69, term 25 years ..... | 1,160 |
|---------------------------------------------------------|-------|

By NEWBORN &amp; HARDING.

|                                                               |     |
|---------------------------------------------------------------|-----|
| Wandsworth—174, Trinity-road, 77 years, ground-rent £15 ..... | 960 |
| Islington—116, Barnsbury-road, 31 years, ground-rent £6 ..... | 395 |
| 194, Liverpool-road, 13 years, ground-rent £7 .....           | 180 |
| Hoxton—11, Napier-street, 16 years, ground-rent £3 .....      | 168 |

FEB. 8.

By R. HOLSWORTH.

|                                                                  |     |
|------------------------------------------------------------------|-----|
| Highbury—244, St. Paul's-road, 62 years, ground-rent £10 .....   | 350 |
| Hoxton—5, Shaftesbury-street, 8 years, ground-rent £2, 10s. .... | 108 |

## MEETINGS.

MONDAY, FEBRUARY 18.

Royal Academy (Lectures in Sculpture).—Mr. A. S. Murray, on "Ancient Sculpture in Bronze: incised designs." I. 8 p.m.

Lectures Institute.—8 p.m.

Society of Arts (Cantor Lectures).—Mr. W. J. Linton on "Wood Engraving." II. 8 p.m.

Leeds and Yorkshire Architectural Society.—Miss A. Garrett, on "Interior Decoration and Furniture." 7.30 p.m.

TUESDAY, FEBRUARY 19.

Institution of Civil Engineers.—Mr. Gisbert Kapp on "Automatic Current Machinery." 8 p.m.

Statistical Society.—Mr. Richard Price-Williams on "The Coal Question." 7.45 p.m.

Birmingham Architectural Association.—Paper by Mr. W. Donahay.

Manchester Architectural Association.—Paper by Mr. H. B. Bare. 7.30 p.m.

Glasgow Architectural Association.—Lecture by Mr. James Sellar.

WEDNESDAY, FEBRUARY 20.

British Archaeological Association.—Mr. E. P. Loftus Brock, F.S.A., on "The Churches of Cheshire." 8 p.m.



**Society of Arts.**—Mr. Benjamin Baker on "The Forth Bridge," 8 p.m.  
**Civil and Mechanical Engineers' Society.**—Mr. J. H. Turner on "The Compression Members of Bridges," 7 p.m.  
**Builders' Foremen and Clerks of Works' Institution.**—Ordinary Meeting, 8.30 p.m.  
**Liverpool Engineering Society.**—Mr. G. Farren on "The Construction of Small Breakwaters and the Siting they give rise to," 8 p.m.  
**Royal Meteorological Society.**—Three Papers will be read, 7 p.m.

#### TUESDAY, FEBRUARY 21.

**Royal Academy (Lectures in Sculpture).**—Mr. A. S. Murray on "Ancient Sculpture in Bronze: Reliefs," 11. 8 p.m.  
**London Institution.**—Mr. Wyke Baylis, F.S.A., on "The Legend of Beauty; or, Art as representing the Passion of our Lives," 6 p.m.  
**Society of Antiquaries.**—8.30 p.m.  
**Edinburgh Architectural Association.**—Mr. W. D. McKay, R.S.A., on "The Rise of the Fine Arts in Scotland," 8 p.m.

#### FRIDAY, FEBRUARY 22.

**Carpenters' Hall (London Wall).**—Professor G. Baldwin Brown, M.A., on "English Furniture of the Eighteenth Century, illustrating the Classical Revival," 8 p.m.  
**Institution of Civil Engineers (Students' Meeting).**—Mr. T. A. Guyatt on "Furnaces," 7.30 p.m.

#### SATURDAY, FEBRUARY 23.

**Royal Institution.**—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation, Wave Theory)," 3 p.m.  
**Builders' Foremen and Clerks of Works' Institution.**—Annual Dinner, Holborn Restaurant, 8 p.m.

### Miscellaneous.

**Surveyors' and Auctioneers' Clerks' Provident Institution.**—The fifth annual general meeting of this association took place at the Auction Mart, Tokenhouse-yard, on Saturday afternoon, Mr. J. H. Sabin presiding. The report of the Committee for the past year, which was read by the secretary, stated that the accounts showed considerable improvement over 1887 in nearly every item. A slight decrease had occurred in the ordinary members' subscriptions, owing to the death of one member in 1887, and the lapse of two others; and to the fact that most of the new members' subscriptions had been for a small period of the year only. The sum of 300l. had been invested, the total amount invested in Consols now being 2,020l. 16s. 8d. In April last, 1,800l. was converted into 2½ per Cent. Stock, and this dividend will be paid from April, 1889, to April, 1903, and a dividend thereafter at 2½ per cent. During the year five quarters' dividend and a bonus on conversion of stock had been received, amounting together to 70l. 3s. 2d. This had been more than enough to cover the year's outlay, and the committee had thus been enabled to add the whole of the other receipts to capital. The committee recorded with regret the death of two of the vice-presidents, Mr. T. A. Roberts and Sir Henry A. Hunt, C.B., who were substantial supporters of the Association. The statement of accounts showed a balance in hand of 76l. 15s. 3d. The adoption of the report and statement of accounts was moved by the Chairman, seconded by Mr. E. F. Winzar, and carried *nem. con.* The election of officers was then proceeded with. The following gentlemen were re-elected to form the Committee of Management for the ensuing year: Mr. J. H. Sabin, Mr. A. Herbert, Mr. R. E. Bartlett, Mr. W. Cudlipp, Mr. R. B. Collins, Mr. A. Griffin, Mr. T. Jones, Mr. H. J. Johnson, Mr. G. Morfee, Mr. J. Payne, Mr. A. J. Puttick, and Mr. E. F. Winzar. Mr. T. Jones was re-elected auditor.

**Paris Universal Exhibition, 1889.**—In response to an urgent appeal from Sir Frederic Leighton, the Chairman of the Fine Arts Committee, over 900l. have been subscribed for the Fine Arts Section, and it is hoped that this amount will be largely increased by private liberality. The Council of the British Section have also set aside from their general revenues a sum of 1,500l. for the Fine Arts, so that there is at present between 2,400l. and 2,500l. available. Contributions will be thankfully received by Sir Polydore de Keyser, the Chairman of the Executive, or by Sir Frederic Leighton, Chairman of the Fine Arts Committee, at 2, Walbrook, E.C.

**The Liverpool Engineering Society.**—The seventh meeting of the present session of this Society was held at the Royal Institution, Colquitt-street, on the 6th inst., the President, Mr. Chas. H. Darbishire, Assoc.-M. Inst. C.E., in the chair, when Mr. H. H. West, Assoc.-M. Inst. C.E., gave a *résumé* of the paper on "Steel in the Hands of the Naval Architect," which he read at the former meeting. An interesting discussion followed, in which several members took part, to which Mr. West replied at great length.

**British Archaeological Association.**—At the meeting of this Association on Wednesday, the 6th inst., Mr. W. de Gray Birch, F.S.A., in the chair, it was announced that this year's congress would be held in the autumn of the present year in Lincolnshire. It was proposed to make visits to Grantham, Barton-on-Humber, Newark, Lincoln Cathedral, and to many other places of interest in the county. Dr. A. Douglas exhibited two original drawings of part of the choir of Dunfermline Abbey, pulled down at the beginning of the present century. The drawings appear to be the only evidences extant. Mr. Loftus Brock, F.S.A., exhibited and described various plans of the portion of the ancient Roman wall of Antoninus, near Falkirk, in danger of demolition for railway works. The banks and ditch are in almost perfect preservation, and it is greatly to be hoped that the threatened removal may be averted. Miss Shortreed exhibited a fine terra-cotta lamp dug up at Rome, having Christian emblems. Mr. Wood produced a fine collection of English gold coins of Charles II. and later kings. Mr. Langdon described some Roman tiles found below an ancient canoe, the discovery of which, at Botley, Hants, was reported at a recent meeting. Mr. J. T. Irvine contributed a drawing of another Saxon slab, with scroll-work patterns, found at Peterborough Cathedral. He also described a curious decorative pattern in colours, found on the wall of an old house recently demolished in Cumbergate. A paper was then read by Major Joseph on the church and parish of St. Atholin, Watling-street. The paper was illustrated by many old views of the church and its fine steeple, with the parish books and the original subscription-list for the erection of the building.

**The English Iron Trade.**—The English iron market shows a decided upward tendency, the hope-inspiring nature of the Board of Trade Returns for January, and the prospects of a good spring and summer trade, having a stimulating effect upon business. Pig-iron has been firmer this week than at any time during the present year. A strong tone has characterised the Glasgow warrant market, and prices are about 9d. to 1s. higher on the week. In sympathy with warrants, some brands of Scotch makers' iron are quoted 1s. a ton more. Cleveland warrants have also been put up 1s. at Glasgow. In the North of England, no prompt iron can be obtained at under 6d. advance on late rates, and some makers quote from 1s. 6d. to 2s. more per ton for forward delivery. Lancashire, Lincolnshire, and Derbyshire brands of pigs are very stiff, and the same is true of Staffordshire pig-iron. The highest price for some time past (46s.) has now been reached for Bessemer iron in the north-west, while on the east coast 47s. 6d. is asked for mixed numbers. Manufactured iron is not quite so active as before, but prices are not only firmly maintained, but show a rising tendency. Steel is enjoying the same full demand observable for a long time past, and values are again tending upwards. Further large orders are being booked by shipbuilders. Engineers continue very busy in nearly all departments.—*Iron.*

**London and County Banking Company.**—The balance-sheet of this company for the half-year ending December 31 last, and which is printed in our advertisement columns, shows that, after paying interest for bad and doubtful debts, allowing 39,000l. odd for rebate on bills not due, and transferring 20,000l. in reduction of Premises Account, the net profits amounted to 191,722l. 1s. 2d. This sum, added to 37,682l. 1s. 2d., the balance brought forward from last account, produces a total of 229,404l. 2s. 4d. The Directors recommended the payment of a dividend of 10 per cent. for the half-year, leaving 29,404l. 2s. 4d. to be carried forward to new account. The present dividend, added to that paid to June 30, makes 20 per cent. for the year 1888.

**A Danish Mæcenat.**—Herr Carl Jacobsen, of Copenhagen, has presented the artists of the Danish capital with a handsome "New Year's Gift," in the shape of commissions for ten large paintings and two groups of sculpture, to be executed by as many rising artists, for his great gallery at New Carlsberg. The value of the commissions is estimated at about 10,000l.

**The London County Council.**—At the meeting of the London County Council on Tuesday, Lord Rosebery was elected Chairman, Sir John Lubbock Vice-Chairman, and Mr. J. F. B. Firth, M.P., Deputy-Chairman.

**Sanitary Assurance Association.**—The eighth annual meeting of this Association was held at No. 5, Argyll-place, W., on Monday last, the president, Sir Joseph Fayrer, K.C.S.I., F.R.S., in the chair. Mr. Joseph Hadley, secretary, read the annual report, which explained that the Council had continued the sanitary inspection and supervision and the issue of sanitary certificates on the plan initiated by the association in 1881. Annual inspections are also continued, and some of the original certificates have now been in force for eight years. The report says "that with newly built property there is a continued improvement necessitating fewer alterations to secure the sanitary certificates," but in no case during the past year has any property inspected for the first time been found to be such as could be certified without alteration. Forty-five certificates have been given to builders and plumbers who have satisfactorily executed sanitary works under the direction of the Association. The action of the Council in promoting the Sanitary Registration of the Buildings Bill chronicled in the report, including the public conference at the Society of Arts in February last, and the representative conference, when the Bill was revised and adopted in its present form, and at which the following bodies were represented:—The Sanitary Assurance Association, Royal Institute of British Architects, Sanitary Association, Public Health Association, Society, London Sanitary Protection Association, Association of Municipal and Sanitary Engineers and Surveyors, Royal Institute of Architects of Ireland. The report records, with great regret, the heavy loss the Council sustained in the early part of last year by the death of the late Professor De Chaumont, F.R.S., who had been one of the warmest supporters of the Association from its formation to the day of his death. The report concluded as follows:—"Though the important bearing of the work of the Association on the public health is not yet fully seen by the general public, the financial statement for the past year clearly proves that the Association is appreciated. The income of the year was 356l. 14s. 2d., and after meeting all liabilities a balance is carried forward." The Chairman, in proposing the adoption of the report, referred to the useful work the Association was doing in directing attention to the necessity for the better sanitary condition of dwellings, in order to secure improvement in the health of the people of large towns, such as the great Metropolis. Sir Vincent H. Kenner Barrington seconded the adoption of the report, and it was carried unanimously.

**The Association of Public Sanitary Inspectors of Great Britain.**—The President of this Association, Mr. Edwin Chadwick, C.B., having entered on his ninetieth year on the 24th ult., it has been thought that the coming annual dinner of the Association would be a fitting opportunity to give him more than ordinary welcome, and as a number of gentlemen have intimated that they would like to take part in the demonstration, the Council have resolved to postpone the annual dinner to Saturday, March 2, in order that the dinner may be a combined demonstration of the friends of the Association. It has also been determined that the dinner a memorial of congratulation to an address shall be presented to Mr. Chadwick from the chair. The dinner will be held Saturday, March 2, at the First Avenue Hotel, Holborn, when Dr. B. W. Richardson, F.R.S., will preside, and present the memorial address.

**Workmen's Dwellings in Berlin.**—The Central Association for the Promotion of the Well-being of the Working-classes in Berlin, the president of which is the well-known Dr. Gneist, has formed a company with the object of erecting a number of small but healthy dwellings for workmen on the outskirts of the city. It would appear from the reports of the association that the want of workmen's dwellings is very great in the German capital, and that the existing private workmen's "barracks" are in an exceedingly unhealthy state. The capital of the new company is 250,000l., and a dividend of 4 per cent. is anticipated.

**The Sanitary Institute.**—Under the auspices of this Institute, a course of two lectures for sanitary officers, specially adapted for candidates preparing for the Institute Examination for Inspectors of Nuisances, is announced. Particulars may be had of the Secretary.



## PRICES CURRENT OF MATERIALS.

| TIMBER.                          |           | £. s. d. | £. s. d. |
|----------------------------------|-----------|----------|----------|
| Teak, R.I. ....                  | load      | 3 0 0    | 14 0 0   |
| Sequoia, U.S. ....               | foot cube | 0 2 3    | 0 3 0    |
| Ash, Canada, ....                | load      | 3 10 0   | 6 0 0    |
| Elm ....                         | load      | 3 10 0   | 6 0 0    |
| Fir, Dantio, &c. ....            | load      | 2 0 0    | 4 0 0    |
| Oak ....                         | load      | 2 10 0   | 4 10 0   |
| Pine, Canada red ....            | load      | 5 10 0   | 7 10 0   |
| " yellow ....                    | load      | 3 5 0    | 4 0 0    |
| Lath, Dantio, ....               | fathom    | 4 10 0   | 5 10 0   |
| St. Petersburg, F. ....          | load      | 5 0 0    | 8 10 0   |
| Wainscot, Riga, &c. ....         | log       | 2 15 0   | 4 5 0    |
| Odessa, crown ....               | load      | 2 15 0   | 3 5 0    |
| Doals, Finland, 2nd and 3rd .... | load      | 9 10 0   | 10 10 0  |
| " 4th and 3rd ....               | load      | 7 10 0   | 9 0 0    |
| Riga ....                        | load      | 7 10 0   | 8 10 0   |
| St. Petersburg, 1st yellow ....  | load      | 11 10 0  | 15 0 0   |
| " 2nd ....                       | load      | 9 10 0   | 11 0 0   |
| " white ....                     | load      | 8 10 0   | 10 10 0  |
| Swedish ....                     | load      | 8 10 0   | 10 0 0   |
| White Sea ....                   | load      | 9 10 0   | 17 0 0   |
| Canada, Pine, 1st ....           | load      | 18 0 0   | 28 10 0  |
| " 2nd ....                       | load      | 12 0 0   | 17 10 0  |
| " 3rd, &c. ....                  | load      | 8 0 0    | 10 10 0  |
| " Spruce, 1st ....               | load      | 9 10 0   | 10 10 0  |
| " 3rd and 2nd ....               | load      | 7 10 0   | 8 10 0   |
| New Brunswick, &c. ....          | load      | 6 15 0   | 8 15 0   |
| Batons, all kinds ....           | load      | 6 10 0   | 20 0 0   |
| Flooring Boards, sq., 1 in. pro- | load      | 0 11 0   | 0 14 6   |
| " 2nd ....                       | load      | 0 8 0    | 0 10 6   |
| " 3rd ....                       | load      | 0 6 0    | 0 7 9    |
| " 4th ....                       | load      | 0 4 0    | 0 4 4    |
| " 5th ....                       | load      | 0 4 0    | 0 4 4    |
| " 6th ....                       | load      | 0 4 0    | 0 4 4    |
| " 7th ....                       | load      | 0 4 0    | 0 4 4    |
| " 8th ....                       | load      | 0 4 0    | 0 4 4    |
| " 9th ....                       | load      | 0 4 0    | 0 4 4    |
| " 10th ....                      | load      | 0 4 0    | 0 4 4    |
| " 11th ....                      | load      | 0 4 0    | 0 4 4    |
| " 12th ....                      | load      | 0 4 0    | 0 4 4    |
| " 13th ....                      | load      | 0 4 0    | 0 4 4    |
| " 14th ....                      | load      | 0 4 0    | 0 4 4    |
| " 15th ....                      | load      | 0 4 0    | 0 4 4    |
| " 16th ....                      | load      | 0 4 0    | 0 4 4    |
| " 17th ....                      | load      | 0 4 0    | 0 4 4    |
| " 18th ....                      | load      | 0 4 0    | 0 4 4    |
| " 19th ....                      | load      | 0 4 0    | 0 4 4    |
| " 20th ....                      | load      | 0 4 0    | 0 4 4    |
| " 21st ....                      | load      | 0 4 0    | 0 4 4    |
| " 22nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 23rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 24th ....                      | load      | 0 4 0    | 0 4 4    |
| " 25th ....                      | load      | 0 4 0    | 0 4 4    |
| " 26th ....                      | load      | 0 4 0    | 0 4 4    |
| " 27th ....                      | load      | 0 4 0    | 0 4 4    |
| " 28th ....                      | load      | 0 4 0    | 0 4 4    |
| " 29th ....                      | load      | 0 4 0    | 0 4 4    |
| " 30th ....                      | load      | 0 4 0    | 0 4 4    |
| " 31st ....                      | load      | 0 4 0    | 0 4 4    |
| " 32nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 33rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 34th ....                      | load      | 0 4 0    | 0 4 4    |
| " 35th ....                      | load      | 0 4 0    | 0 4 4    |
| " 36th ....                      | load      | 0 4 0    | 0 4 4    |
| " 37th ....                      | load      | 0 4 0    | 0 4 4    |
| " 38th ....                      | load      | 0 4 0    | 0 4 4    |
| " 39th ....                      | load      | 0 4 0    | 0 4 4    |
| " 40th ....                      | load      | 0 4 0    | 0 4 4    |
| " 41st ....                      | load      | 0 4 0    | 0 4 4    |
| " 42nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 43rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 44th ....                      | load      | 0 4 0    | 0 4 4    |
| " 45th ....                      | load      | 0 4 0    | 0 4 4    |
| " 46th ....                      | load      | 0 4 0    | 0 4 4    |
| " 47th ....                      | load      | 0 4 0    | 0 4 4    |
| " 48th ....                      | load      | 0 4 0    | 0 4 4    |
| " 49th ....                      | load      | 0 4 0    | 0 4 4    |
| " 50th ....                      | load      | 0 4 0    | 0 4 4    |
| " 51st ....                      | load      | 0 4 0    | 0 4 4    |
| " 52nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 53rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 54th ....                      | load      | 0 4 0    | 0 4 4    |
| " 55th ....                      | load      | 0 4 0    | 0 4 4    |
| " 56th ....                      | load      | 0 4 0    | 0 4 4    |
| " 57th ....                      | load      | 0 4 0    | 0 4 4    |
| " 58th ....                      | load      | 0 4 0    | 0 4 4    |
| " 59th ....                      | load      | 0 4 0    | 0 4 4    |
| " 60th ....                      | load      | 0 4 0    | 0 4 4    |
| " 61st ....                      | load      | 0 4 0    | 0 4 4    |
| " 62nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 63rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 64th ....                      | load      | 0 4 0    | 0 4 4    |
| " 65th ....                      | load      | 0 4 0    | 0 4 4    |
| " 66th ....                      | load      | 0 4 0    | 0 4 4    |
| " 67th ....                      | load      | 0 4 0    | 0 4 4    |
| " 68th ....                      | load      | 0 4 0    | 0 4 4    |
| " 69th ....                      | load      | 0 4 0    | 0 4 4    |
| " 70th ....                      | load      | 0 4 0    | 0 4 4    |
| " 71st ....                      | load      | 0 4 0    | 0 4 4    |
| " 72nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 73rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 74th ....                      | load      | 0 4 0    | 0 4 4    |
| " 75th ....                      | load      | 0 4 0    | 0 4 4    |
| " 76th ....                      | load      | 0 4 0    | 0 4 4    |
| " 77th ....                      | load      | 0 4 0    | 0 4 4    |
| " 78th ....                      | load      | 0 4 0    | 0 4 4    |
| " 79th ....                      | load      | 0 4 0    | 0 4 4    |
| " 80th ....                      | load      | 0 4 0    | 0 4 4    |
| " 81st ....                      | load      | 0 4 0    | 0 4 4    |
| " 82nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 83rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 84th ....                      | load      | 0 4 0    | 0 4 4    |
| " 85th ....                      | load      | 0 4 0    | 0 4 4    |
| " 86th ....                      | load      | 0 4 0    | 0 4 4    |
| " 87th ....                      | load      | 0 4 0    | 0 4 4    |
| " 88th ....                      | load      | 0 4 0    | 0 4 4    |
| " 89th ....                      | load      | 0 4 0    | 0 4 4    |
| " 90th ....                      | load      | 0 4 0    | 0 4 4    |
| " 91st ....                      | load      | 0 4 0    | 0 4 4    |
| " 92nd ....                      | load      | 0 4 0    | 0 4 4    |
| " 93rd ....                      | load      | 0 4 0    | 0 4 4    |
| " 94th ....                      | load      | 0 4 0    | 0 4 4    |
| " 95th ....                      | load      | 0 4 0    | 0 4 4    |
| " 96th ....                      | load      | 0 4 0    | 0 4 4    |
| " 97th ....                      | load      | 0 4 0    | 0 4 4    |
| " 98th ....                      | load      | 0 4 0    | 0 4 4    |
| " 99th ....                      | load      | 0 4 0    | 0 4 4    |
| " 100th ....                     | load      | 0 4 0    | 0 4 4    |

## TIMBER (continued).

|                                 | £. s. d. | £. s. d.  |
|---------------------------------|----------|-----------|
| Rose, Rio ....                  | ton      | 12 0 0    |
| Bahia ....                      | ton      | 13 0 0    |
| Satin, St. Domingo ....         | ton      | 0 0 0     |
| Porto Rico ....                 | ton      | 0 0 0     |
| Walnut, Italian ....            | ton      | 0 0 4 1/2 |
| METALS.                         |          |           |
| Iron—Bar, Welsh, in London .... | ton      | 5 5 0     |
| " at works in Wales ....        | ton      | 4 15 0    |
| " Staffordshire, in London .... | ton      | 5 10 0    |
| COBBLES.                        |          |           |
| British, cake and ingot ....    | ton      | 78 0 0    |
| Best selected ....              | ton      | 79 0 0    |
| Sheets, strong ....             | ton      | 80 0 0    |
| Chill, bars ....                | ton      | 78 0 0    |
| Yellow Metal ....               | ton      | 0 0 7     |
| Lead—Pig, Spanish ....          | ton      | 12 16 3   |
| English, common brands ....     | ton      | 13 2 6    |
| Sheet, English ....             | ton      | 14 0 0    |
| SPICES.                         |          |           |
| Silesian, special ....          | ton      | 17 15 0   |
| Ordinary brands ....            | ton      | 17 12 6   |
| TINS.                           |          |           |
| Banco ....                      | ton      | 99 0 0    |
| Billiton ....                   | ton      | 99 0 0    |
| Strait ....                     | ton      | 95 0 0    |
| Australian ....                 | ton      | 95 0 0    |
| English, light ....             | ton      | 98 10 0   |
| Zinc—English sheet ....         | ton      | 21 0 0    |
| OILS.                           |          |           |
| Lined ....                      | ton      | 18 17 6   |
| Cocanut, Ceylon ....            | ton      | 28 0 0    |
| Ceylon ....                     | ton      | 28 0 0    |
| Palm, Lagos ....                | ton      | 28 0 0    |
| Rapeseed, English pale ....     | ton      | 28 0 0    |
| " brown ....                    | ton      | 29 10 0   |
| Cottonseed, refined ....        | ton      | 25 15 0   |
| Tallow and Oleum ....           | ton      | 19 0 0    |
| Lubricating, U.S. ....          | ton      | 5 0 0     |
| " refined ....                  | ton      | 7 0 0     |
| Tar—Stockholm ....              | barrel   | 1 2 0     |
| Archangel ....                  | barrel   | 0 13 0    |

DURHAM.—For proposed new dwelling-house, No. 37, North Bailey, for the University of Durham. Mr. J. Henry, architect, Durham.

## Accepted Tenders.

|                                          |          |
|------------------------------------------|----------|
| J. Kell (Masons' Work) .....             | £320 0 0 |
| W. Walton (Joiners' Work) .....          | 413 0 0  |
| W. T. Blakey (Slaters' Work) .....       | 55 8 0   |
| E. Pearson (Plasterers' Work) .....      | 76 0 0   |
| J. Laidler (Plumbers' Work) .....        | 231 6 0  |
| Hinchley & Wallis (Painters' Work) ..... | 27 0 0   |
| [All of Durham.]                         |          |

HAMMERSMITH.—For 240 yards wrought-iron fencing at Ravenscourt Park, Hammersmith, for the Commissioners for Libraries and Museums. Mr. B. F. Roberts, architect, 3, The Grove, Hammersmith.

## Per yard. Double Gates. Single Gates.

|                               | s. d.    | £. s. d. | £. s. d. |
|-------------------------------|----------|----------|----------|
| Conningsham, Son, & Co. ....  | 13 2     | 6 5 0    | 3 5      |
| Hill & Smith ....             | 11 9     | 3 17 6   | —        |
| Steven Bros. ....             | 7 9      | 6 9 6    | —        |
| Fenwick & Co. ....            | £215 0 0 |          |          |
| Baillie & Co. ....            | 259 0 0  |          |          |
| C. Bluff ....                 | 245 0 0  |          |          |
| A. Perkins ....               | 235 16 0 |          |          |
| Haywood Bros. ....            | 225 0 0  |          |          |
| A. Williams ....              | 220 0 0  |          |          |
| McCall & Co. ....             | 215 0 0  |          |          |
| T. Adams ....                 | 185 0 0  |          |          |
| Johnson, Bros., & Co. ....    | 178 0 0  |          |          |
| White & Co. ....              | 169 0 0  |          |          |
| Faulkner ....                 | 164 0 0  |          |          |
| Badham & Co. (accepted) ..... | 149 11 0 |          |          |

HORSHAM.—For alterations to business premises in East-street, Horsham, for Mr. Edward Burston, Mr. Chas. H. Burston (E. & C. H. Burston) architect, Horsham.

|                    |          |
|--------------------|----------|
| G. Sharp ....      | £397 0 0 |
| Dewdney Bros. .... | 387 0 0  |
| Pannett Bros. .... | 380 0 0  |
| Rowland Bros. .... | 379 0 0  |
| H. Potter ....     | 320 0 0  |
| Jos. Potter ....   | 310 0 0  |
| [All of Horsham.]  |          |

LEWISHAM.—For the formation of Rosenthal-road, High-street, Lewisham, and laying sewer, and surface-water drain, for Mr. W. G. Essell, Mr. H. A. Alexander, 72, Cannon-street, E.C., architect and surveyor.

|                                                                                                                                                                   |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Baile & Blackmore .....                                                                                                                                           | £638 0 0   |
| Glasbrook ....                                                                                                                                                    | 600 0 0    |
| Woodham & Fry ....                                                                                                                                                | 629 0 0    |
| W. & J. Woodham (accepted) .....                                                                                                                                  | 417 0 0    |
| LONDON.—For taking down and rebuilding Nos. 6 and 7, West Smithfield, for Mr. George Herbert, Mr. Alfred Howard, architect, 6, Martin's-lane, Cannon-street, E.C. |            |
| Quantities by the architect:—                                                                                                                                     |            |
| J. W. Falkner ....                                                                                                                                                | £2,895 0 0 |
| Colls & Sons ....                                                                                                                                                 | 2,844 0 0  |
| J. Lidstone & Son ....                                                                                                                                            | 2,755 0 0  |
| W. J. Lester & Co. ....                                                                                                                                           | 2,698 0 0  |
| Holliday & Greenwood ....                                                                                                                                         | 2,589 0 0  |
| J. Simpson & Son ....                                                                                                                                             | 2,550 0 0  |
| E. Toms ....                                                                                                                                                      | 2,612 0 0  |
| Geuld & Brand ....                                                                                                                                                | 2,487 0 0  |
| Kilby & Gayford ....                                                                                                                                              | 2,442 0 0  |
| Jackson & Todd (accepted) .....                                                                                                                                   | 2,394 0 0  |

LONDON.—For alterations to the "Dolphin" public-house, Mare-street, Hackney. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—

|                                 |            |
|---------------------------------|------------|
| W. Smith ....                   | £2,725 0 0 |
| Hearle & Son ....               | 2,677 0 0  |
| J. Mills ....                   | 2,660 0 0  |
| Staines & Son ....              | 2,432 0 0  |
| Calman & Co. ....               | 2,359 0 0  |
| Drew & Cadman ....              | 2,368 0 0  |
| W. Shumrun ....                 | 2,340 0 0  |
| W. Johnson ....                 | 2,280 0 0  |
| C. Cox ....                     | 2,240 0 0  |
| G. Mower & Son (accepted) ..... | 2,162 0 0  |
| Jackson & Todd (accepted) ..... | 2,140 0 0  |

LONDON.—For alterations to the "Shard Arms" public-house, 610, Old Kent-road, S.E. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—

|                                 |            |
|---------------------------------|------------|
| Drew & Cadman ....              | £2,813 0 0 |
| Hearle & Son ....               | 2,793 0 0  |
| W. Shumrun ....                 | 2,745 0 0  |
| Staines & Son ....              | 2,695 0 0  |
| W. Smith ....                   | 2,690 0 0  |
| J. Mills ....                   | 2,600 0 0  |
| Jackson & Todd ....             | 2,520 0 0  |
| W. Johnson ....                 | 2,483 0 0  |
| W. L. Kellaway (accepted) ..... | 2,360 0 0  |

LONDON.—For alterations at 3, Crosby-square, for Mr. Maurice Beddington, Messrs. Josephs & Smithem, architects:—

|                                                                                                                                                                                                    |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Colls & Sons ....                                                                                                                                                                                  | £3,569 0 0 |
| Williams & Sons ....                                                                                                                                                                               | 3,115 0 0  |
| Ashby Bros. ....                                                                                                                                                                                   | 2,935 0 0  |
| LONDON.—For alterations to the "Jamaica" Tavern, St. Michael's-alley, Cornhill. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:— |            |
| Hell, Beddall & Co. ....                                                                                                                                                                           | £1,394 0 0 |
| Cox, C. ....                                                                                                                                                                                       | 1,084 0 0  |
| Drew & Cadman ....                                                                                                                                                                                 | 1,068 0 0  |
| Ashby & Horner (accepted) .....                                                                                                                                                                    | 1,025 0 0  |

LONDON.—For alterations and additions to the "Caledonian Arms," Stoke Newington.—A. Hood, 471, Bethnal Green-road. \* Amended estimate accepted.

LONDON.—For sundry alterations and additions to the girls' department at Thomas-street School, for the London School Board. Mr. T. J. Bailey, architect:—

|                       |          |
|-----------------------|----------|
| Flaxman ....          | £335 0 0 |
| P. & F. Wood ....     | 320 0 0  |
| Reed ....             | 283 0 0  |
| G. Barker ....        | 275 0 0  |
| Atherton & Latta .... | 238 0 0  |
| Shewcock ....         | 235 0 0  |
| Holland ....          | 214 0 0  |

## COMPETITIONS, CONTRACTS &amp; PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

## COMPETITION.

| Nature of Work.                             | By whom Required.                 | Premium.                | Designs to be delivered. | Page. |
|---------------------------------------------|-----------------------------------|-------------------------|--------------------------|-------|
| Magistrates' Court and Police Station ..... | Bootham-Linacre Corporation ..... | 50, 80, and 20 guineas. | May 6th                  | i.    |

## CONTRACTS.

| Nature of Work, or Materials.                                                           | By whom Required.                    | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------|--------------------------|-------|
| Kerbing, Tarpaving, &c. ....                                                            | Lewisham Bd. of Wks. ....            | Official .....                    | Feb. 19th                | xi.   |
| Loadmaking and Paving Works ....                                                        | Tottenham Local Bd. ....             | J. E. Worth .....                 | do.                      | xi.   |
| Loadmaking Works ....                                                                   | Southend Local Board ....            | P. Dodd .....                     | do.                      | ii.   |
| Granite Pitching ....                                                                   | Mill End Vestry .....                | J. M. Knight .....                | Feb. 20th                | xiii. |
| Leveage Timber ....                                                                     | G. W. R. Co. ....                    | Official .....                    | Feb. 21st                | xiii. |
| Leveage Works ....                                                                      | Chorley Corporation ....             | do. ....                          | Feb. 25th                | xiii. |
| Granite Gate Piers and Kerbing, &c. ....                                                | Hammersmith Vestry .....             | H. R. Gough .....                 | do.                      | xiii. |
| Reservoir and Laying Water Mains, &c. ....                                              | Cheshunt Local Board ....            | T. Bennett .....                  | Feb. 26th                | xiii. |
| Street Valves, Hydrants, &c. ....                                                       | do. ....                             | do. ....                          | do.                      | xiii. |
| Induct near Bickleigh ....                                                              | G. W. R. Co. ....                    | Official .....                    | do.                      | xiii. |
| Works and Materials ....                                                                | Hammersmith Vestry .....             | H. Mar .....                      | Feb. 27th                | xiii. |
| New Schools, Coventry ....                                                              | Trustees Bilbake Boys' Charity ..... | Giles, Gough, and Trollope .....  | do.                      | xiii. |
| Excavating, Piling, &c., Foundation for Tank Enlargement of Head Post Office, Newcastle | R. H. & Co. Gas Co. ....             | Official .....                    | Feb. 29th                | ii.   |
| Works and Materials ....                                                                | St. Mary's Vestry .....              | do. ....                          | do.                      | ii.   |
| Broken Stone, Rootway Korb, &c. ....                                                    | do. ....                             | do. ....                          | do.                      | xiii. |
| Extension of Tower                                                                      | Toxteth Park Local Bd. ....          | J. Price .....                    | do.                      | xiii. |
| Disinfectant Apparatus & Laying Machinery                                               | do. ....                             | do. ....                          | do.                      | xiii. |
| Engine House, Boiler House, Coal Stoves, &c.                                            | Leicester Corporation ....           | J. Gordon .....                   | do.                      | xiii. |
| Ironware Pipe Saver ....                                                                | Haddington Vestry .....              | Official .....                    | Mar. 4th                 | xii.  |
| Works and Materials (Eastern R. Sub-Dist.)                                              | War Department .....                 | do. ....                          | do.                      | xii.  |
| Do. (S. East. R. E. Dist.)                                                              | do. ....                             | do. ....                          | do.                      | xii.  |
| Kirk Paving, Brick Boundary Walls, &c. &c.                                              | Plumstead Burial Board               | H. H. Church                      | Mar. 5th                 | ii.   |
| Works & Materials (Weymouth R. E. Sub-Dist.)                                            | War Department .....                 | Official .....                    | Mar. 6th                 | ii.   |
| Works and Materials (Gosport R. E. Sub-Dist.)                                           | do. ....                             | do. ....                          | Mar. 8th                 | xi.   |
| Loadmaking and Paving Works ....                                                        | Grays Thurrock L. Bd. ....           | do. ....                          | do.                      | xiii. |
| Works and Materials (Aldershot R. E. Dist.)                                             | War Department .....                 | do. ....                          | Mar. 13 <sup>th</sup>    | ii.   |
| Works & Materials (Chatham R. E. Sub-Dist.)                                             | do. ....                             | do. ....                          | Not stated.              | ii.   |
| Works and Materials (S. Wainfleet R. Sub-Dist.)                                         | do. ....                             | A. W. Soames .....                | do.                      | ii.   |
| Institution, Oxford                                                                     | do. ....                             | A. Waterhouse .....               | do.                      | xiii. |
| Thrupe, Duke-street, Mayfair                                                            | do. ....                             | do. ....                          | do.                      | xiii. |

**LONDON.**—For alterations and additions to the South-Eastern Hospital, for the Metropolitan Asylums Board:—  
 Gamage ..... £250 0 0  
 Wall Bros. .... 640 0 0  
 W. & H. Castle ..... 547 0 0  
 H. L. Holloway (accepted) ..... 537 0 0  
 W. Buckridge ..... 515 0 0  
 K. E. Evans ..... 468 0 0

**LONDON.**—For new troughs and flushing tanks to boys' and girls' water-closets, at Cayley-street Schools, for the London School Board. Mr. T. J. Bailey, architect:—  
 Flaxman ..... £280 0 0  
 F. and F. Wood ..... 250 0 0  
 Davis Bros. .... 234 0 0  
 Atherton & Laith ..... 230 0 0  
 Holland ..... 210 0 0  
 G. Barker ..... 205 0 0  
 Shorwood ..... 185 0 0  
 Norris & Luke ..... 184 0 0  
 Derby ..... 117 0 0

**SWAY (Hants).**—For the erection of the proposed "Forest-beach Hotel," and stabling, near the Sway station of the London and South-Western Railway, for Messrs. Strong & Co., of Romsey. Mr. W. H. Mitchell, architect, Southampton:—  
 Chapman, Woolston ..... £2,521 0 0  
 Stevens & Sons, Southampton ..... 2,458 0 0  
 H. W. Bull, Southampton ..... 2,322 0 0  
 George & Harding, Bournemouth ..... 2,218 0 0  
 Jenkins & Sons, Bournemouth ..... 2,150 0 0  
 Rashley Bros., Lymington ..... 2,148 0 0

\* Accepted, subject to slight variations.

**PLYMOUTH.**—For the erection of new premises in George-street for the Wilts and Dorset Banking Company, Limited. Mr. George Michael Silley, 17, Craven-street, Strand, London, architect. Quantities by Messrs. Fowler & Hugman, Craig's-court, W.C.:—  
 Fethick Brothers, Plymouth ..... £8,444 0 0  
 H. W. Bull, Southampton ..... 7,329 0 0  
 Letbridge & Son, Plymouth ..... 7,200 0 0  
 Shillito & Son, Bury St. Edmunds ..... 7,100 0 0  
 Rows, Plymouth ..... 6,920 0 0  
 Kennedy, Plymouth ..... 6,738 0 0  
 Laphorn & Goad, Plymouth ..... 6,740 0 0  
 Roberts, Plymouth ..... 6,684 0 0  
 J. Reed, Plymouth ..... 6,593 0 0  
 Finch, Plymouth ..... 6,589 0 0  
 Blowey, Plymouth ..... 6,500 0 0  
 Trevena, Plymouth ..... 6,435 0 0  
 Dehman, Plymouth ..... 6,389 0 0  
 G. Shillaber, Plymouth ..... 6,390 0 0

**YARMOUTH.**—For laying 12,750 yards super of 2½ in. concrete (footways); 7,100 yards run of 5 in. by 9 in. concrete kerb; and 350 circular corners in ditto, for the Great Yarmouth Urban Sanitary Authority. Mr. J. W. Cockrill, A.R.I.B.A., Borough Surveyor:—  
 H. Lockwood, Manchester ..... £3,955 7 0  
 Elliott's Patent Stone Company, London ..... 3,537 10 0  
 O. Lister, Ilkley ..... 3,060 15 0  
 The Brunswick Rock Paving Company, London ..... 2,995 6 0  
 Smiles Bros., Middlesbrough ..... 2,830 10 8  
 Woods & Co., London ..... 2,591 10 0  
 Greenwood & Sons, Halifax ..... 2,563 5 0  
 H. & J. Best, Dewsbury ..... 2,218 2 10  
 Stuart's Granolithic Paving Company, London ..... 2,146 18 0  
 T. Cordingley & Sons, Bradford ..... 2,120 0 0  
 McKay & Co., Walthamstow ..... 2,091 15 8  
 M. C. Duffy & Son, London ..... 2,069 17 8  
 Benley & Co., Anerley, S.E. ..... 2,041 0 0  
 J. Black, Bradford ..... 2,030 0 0  
 Grano-Metallic Paving Company, London ..... 2,015 0 0  
 Wilkinson & Co., Newcastle ..... 1,953 18 6  
 J. Hall, Rugby ..... 1,987 4 4  
 A. E. Wilson & Co., London ..... 1,870 0 0  
 Thompson, Middlesbrough ..... 1,866 1 4  
 Rackham & Co., Blackheath ..... 1,865 0 0  
 Patent Paving Construction Company, London ..... 1,863 8 9  
 M. Macleod, London ..... 1,940 2 0  
 M. Barnard, Yarmouth ..... 1,825 0 0  
 N. H. R. Hill, Plymouth ..... 1,856 19 8  
 Wheeler, London ..... 1,851 0 0  
 G. Bell, Tottenham ..... 1,590 10 0  
 Hindley & Co., Manchester ..... 1,580 10 0  
 Bray, Yarmouth ..... 1,542 10 0  
 R. Nodd, Yarmouth (accepted) ..... 1,530 0 0  
 F. Lister, Leeds ..... 1,509 1 8  
 J. Chapman, Corbridge ..... 1,431 12 6

[Borough Surveyor's estimate, £1,735.]

**WROTHAM (Kent).**—For the erection of a pair of cottages at Wrotham, Kent, for the Basted Papermills Company, Limited. Mr. R. Percy Monckton, F.R.I.B.A., architect, 32, Walbrook, E.C.:—  
 Igoulden (Wrotham) ..... £430 10 0  
 Albion & Sons (Shipbourne) ..... 425 0 0  
 Accepted.

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#### TO CORRESPONDENTS.

L. R. Rome (your communication duly received).—C. B.—W. E. M.—F. R. F.—V. O. P.—T. W. W. (too late for this week).—E. N. (ditto). All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline printing out books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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BOX GROUND. COMBE DOWN.

WESTWOOD GROUND. STOKES GROUND.

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**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest material for damp courses, railway carriages, warehouses, floors, flat roofs, stables, cow-sheds, and milk rooms, graneries, tan-rooms, and terraces. [ADV]

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There are still a few districts in which we are not yet represented. Correspondence invited.



## ILLUSTRATIONS.

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| Portions of Old Florence threatened with Demolition: The Mercato Vecchio, The Amieri Palace, Door from the house of the "Arte dei Rigattieri," and the Loggia del Pesco (Giorgio Vasari, Architect) | Two Single-Page Ink-Photos. |
| Examples of German Towers: The Kilianskirche, Heilbronn, and Frankfort Cathedral.—From Drawings by Herr C. Bütter                                                                                   | Single-Page Photo-Litho.    |
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| Chapel and School, Leeds.—Messrs. Chorley & Connon, Architects                                                                                                                                      | Single-Page Photo-Litho.    |
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### The Proposed Addition to Westminster Abbey.

**W**E did not fail to note the announcement made a short time since in the daily papers that a Bill would be submitted to the House of Commons during the ensuing session to provide for the erection and maintenance of a monumental chapel in connexion with Westminster Abbey. The idea of such a chapel was a good deal discussed in our columns in 1884, when two or three plans and suggestions were published, and a correspondence on the subject was initiated by a letter from Mr. Fergusson, accompanied by a plan of his own for the proposed addition, which was intended as an improvement on a suggestion of Sir Gilbert Scott's, previously published in a sketch form in the *Pall Mall Gazette*. Fergusson's letter, with the plan attached, will be found in the *Builder* for February 16, 1884, and in the issue for February 23 of the same year we published a letter from Mr. Somers Clarke, protesting against the scheme on archaeological grounds, and accompanied by a plan showing the amount of remains or traces of ancient Mediaeval buildings which would be interfered with or demolished in carrying out the scheme. This was followed by a reply from Mr. Fergusson (March 1, 1884), and other correspondence, in which Mr. Clarke, Mr. Oldrid Scott, and others, took part, on March 8, winding up with a final letter from Mr. Fergusson on March 15. The opinions and arguments for and against the scheme, expressed in these letters, were of some interest and importance, and we have, therefore, given the dates, for any one who wishes to refer to them.

Concerning the wording and provisions of the proposed Bill we have no criticism to make; it is a business-like document, not concerning itself with any architectural questions, but making provision for the constitution of a Commission with perpetual succession and a common seal, with power to acquire lands and erect thereon a chapel, and to transfer the same, with all rights, powers, &c., to the Dean and Chapter of Westminster. The provisions are general, and do not bind the proposed Commissioners to any special site or any architectural treatment;

and, if it is admitted that an addition of the kind proposed is desirable, there is nothing in the form of the Bill to call for criticism from an architectural point of view. We may merely mention that the Commissioners proposed are the Dean of Westminster, the Rev. Canon Farrar, the Duke of Westminster, Lord Wantage, Mr. G. Cubitt, Mr. G. Shaw-Lefevre, Mr. Bertram Woodhouse Currie, Mr. Henry Hicks Gibbs, "and such other persons as shall be appointed by her Majesty's Government."

From a letter of the Dean of Westminster which appeared in Tuesday's *Times*, however, it is evident that the scheme contemplated, though not specifically described in the Bill, is substantially the same which has been previously discussed in our columns, viz., the erection of what has been described (in very misleading terms) as a new "south transept" to the Abbey; but which is, in fact, a very large, nearly separate, building tacked on at the eastern face of the Chapter-house, and extending southwards nearly at right angles to the Abbey Church. The question as to the advisability of such an addition for the purpose contemplated,—the provision of further space for the erection of national monuments in or in connexion with the Abbey,—presents itself in this case under two aspects, archaeological and architectural, which it is more convenient to consider separately.

The archaeological objection to the scheme proposed is that which has already been formulated in our columns by Mr. Somers Clarke in his letter of February 23, 1884, above referred to. It is that the new building, in all the forms in which it has been proposed, would obliterate various relics, of no little historical interest, of mediaeval buildings which formerly constituted part of the Abbey precincts. The most important of these are the remains of St. Catherine's Chapel, on the east side of the Little Cloister, and the Infirmary Hall. Mr. Clarke includes among remains that would be obliterated the slype leading from the Little Cloister to the College Garden, in continuation of the line of the east walk of the Little Cloister; but he has made rather the worst of the case, as the new chapel could certainly be carried out on the proposed scheme, with a very little modification in the position of its western wall, without interfering with this or with the east walk of the Little Cloister. Speaking generally, however, the scheme would involve, no doubt, a general trampling out of the history and relics of this portion of the Abbey pre-

cinct, as well as the demolition of several houses now the habitations of some of the clergy connected with the Abbey, for whom residences must be found elsewhere; and this demolition the Dean himself seems to consider as involving the practical destruction or serious modification of the Little Cloister. The Dean's own objections to the scheme as hitherto proposed are thus stated in his letter to the *Times*:—

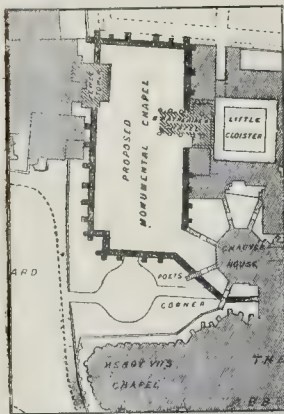
"My own one objection to the proposed scheme is that it appears to me to be somewhat needlessly ambitious, and therefore needlessly destructive. It seems to contemplate the erection of a chapel whose superficial area will equal or exceed that of the whole western limb of the existing Church, involving therefore an elevation which would seriously interfere with the magnificent view of the Abbey towering above the surrounding buildings, as seen from the south. But it is open, as it seems to me, to a still more grave objection, as necessitating the practical destruction of one of the most interesting portions of the Abbey buildings, the Little Cloister, some of the houses of which are scheduled in the Bill. The objections to the demolition of these houses, whether based on practical or on archaeological grounds, seem to me, I confess, to grow stronger on every inspection of the site, or consideration of the question. It seems to be the one feature in the Bill which will provoke the entirely disinterested opposition of many whose sympathy and co-operation would be invaluable."

The answer which was made by Fergusson to the archaeological objections was that, while he would be the last to interfere unnecessarily with any relic of old building, he did not consider that the historic or archaeological value of the remains on the site was such as ought to interfere with a great modern architectural scheme, which was practically required for providing space for further national monuments in connexion with the great church which has for so many generations been regarded as the most fitting resting-place for those whose memory the nation has delighted to honour. And if the scheme were in other respects a satisfactory one, we should be disposed to acquiesce in this argument. But there are various other considerations which go to weaken it very much.

The plan as proposed by Fergusson was intended as an improvement on the original suggestion of Sir Gilbert Scott, inasmuch as the latter proposed a kind of new "Westminster Hall," a separate and very large building, the site of which was to be provided for, partly, by pulling down all the houses in Abingdon-street, towards which the new building was to face. The special point of Fergusson's plan was that the new building



should not be separate from, but connected with and entered from, the Abbey. As a separate building, he argued, a mere Act of Parliament or public decision that interment there should be equivalent to interment in the Abbey would avail nothing so far as the sentiment of the matter was concerned. He planned a somewhat less ambitious building, but still a portentously large one, with an ante-chapel very cleverly fitted in between the two easternmost flying buttresses of the Chapter-house, and entered from the Abbey under the Chapter-house buttresses; the ante-chapel was to have its greatest length east and west, and from its south side was to extend the large monumental chapel, having its greatest length north and south, and extending southwards to the boundary of College Gardens; the width of the monumental chapel corresponding with the length of the ante-chapel, which forms a kind of narthex to it. The architectural connexion with the existing building was to be formed by the ante-chapel, which was the articulating member, so to speak, in the connexion; and this is as well managed on plan as it well could be under the circumstances. The accompanying cut, a reproduc-



Proposed Monumental Chapel to be attached to Westminster Abbey.—(From a portion of a plan published in the "Nineteenth Century.")

tion of part of a plan published in connexion with Mr. Shaw-Lefevre's recent article in the *Nineteenth Century*, shows roughly, we presume, the scheme as now proposed, and forms a characteristic illustration of the difference between an architectural and a non-architectural plan. In this case, it will be seen, there is not a pretext of an attempt to join the old and new plans in an architectural manner; there is no architectural combination of the two; the buttresses of the Chapter House are left sticking out through the new walls in the most absurd and accidental fashion. It can hardly be supposed that it would in any case be allowed to be carried out in this way; but the plan is highly characteristic of the kind of illustrations which are produced by the amateur architectural lights who now come forward as the advisers and instructors of the public and of Parliament in these matters. Like the plan of Hyde Park Corner, it is the plan of a bungler who has not the most elementary idea of architectural design or arrangement, and who apparently is desirous to leave his mark on London in as many architectural blunders as an ignorant and indifferent public and Parliament will allow him money for. As a proof of the total want of any kind of architectural principle which underlies Mr. Shaw-Lefevre's efforts at architectural improvement, it may be observed that while in the so-called restoration at Westminster Hall it was his particular boast that he had got structures rebuilt on their ancient foundations, this Westminster Abbey scheme, on the other hand, is to be carried out in

defiance and obliteration of ancient remains. If ancient foundations are of such sacred value on one side of the road, how is it that they lose all their value on the other side?

However, that is a point for archaeological opponents, and we make them a present of it. Our present consideration is, what will be the architectural effect of a building added to Westminster Abbey on this scale and in this manner? And thereupon our decided opinion is that, both in regard to the scale and position of the proposed building, the architectural effect will be very unsatisfactory. It is proposed to connect a building as large as the nave of the Abbey with the latter, not in any centralised manner, not in any such way as to produce an architectural climax of any kind, and to help and carry on the design of the existing building, but to *hinge* it on, so to speak, to an angle of the Abbey plan (not even at a right angle), at a part of the ancient building where there is no *point d'appui* in the plan for the abutting of such a new mass of building, and where access to it from the ancient interior with which it is to be connected is only to be gained in a round-the-corner sort of fashion, by a narrow aisle winding under the flying buttresses of the nave. Such a manner of joining a new building to an existing building is eminently unarchitectural. Moreover, the new building, from the size proposed for it on plan, must either be very low and squat in proportion, or it must be of such scale in elevation as to rival the Abbey, instead of being in subordination to it; and the manner in which it is proposed to place it in reference to the Abbey will render it in that case the more obtrusive; it will be a kind of question whether the Abbey is part of the chapel, or the chapel a part of the Abbey. This will be more especially the case owing to the fact that the position in which it is proposed to place the new building is immediately adjoining the most delicate and ornate portion of the Abbey architecture, which must inevitably appear dwarfed and crushed in comparison. The Dean of Westminster, in his before-mentioned letter, uses the argument that the proposed new chapel is "to form an integral portion of the Abbey Church, in the same manner and to the same degree as Henry VII's Chapel, the exceeding interest of which is in no way diminished by its being a separate building, of another age and another style of architecture to the church of Henry III. It is to be connected with the interior of the Abbey by a vestibule winding round the eastern exterior of the Chapter-house—a vestibule itself, it is to be hoped, so constructed as to form a worthy approach to a structure in entire harmony with the stately buildings in whose immediate vicinity it would stand." Now it is really too absurd to talk as if a building tacked on at an accidental kind of angle, could by any possibility form "an integral part of the building" in the same way that Henry VII's Chapel is. Henry VII's Chapel is on the axis of the main building, and in entire conformity with it as regards plan. Here is a thing which is a mere excrescence on the existing plan, having no logical relation to it whatever; you cannot make that a part of the ancient church in the sense that Henry VII's Chapel is. As to the desire for "a worthy approach" to the new chapel, the Dean may well ask for that, but he will not get it on the plan as now propounded to the public. An access more totally without dignity, or even common convenience, than that of a narrow aisle round the outside of the Chapter-house could hardly be imagined. But there is another consideration arising out of the proximity of the proposed building to Henry VII's Chapel. The latter is the richest and most ornate portion of the whole structure, and any new building to be brought into immediate proximity to it must of necessity (architecturally) be also of a rich and ornate character. A large plain building intruded at that point would have the worst possible effect with regard to *ensemble*; anything that is done there should be done in a sumptuous manner, and without

counting cost or economising; and the adequate treatment in that sense of a building of the size proposed will cost a great deal more, probably, than any of the promoters of it are dreaming of.

There is a third question in connexion with the subject which we have not yet touched upon,—that of sentiment. The Dean of Westminster fully recognises the importance of this in his letter. He speaks of "the privilege of commemorating the great men of each successive generation in a spot which brings their memorials into close proximity with the far-reaching and unbroken memories of the whole history of our race." But, he adds, "of course, if such a privilege is of no value in the eyes of Englishmen, I have no more to say. The present Bill, or any analogous project, is waste paper, and the Abbey itself is merely a stately church encumbered with many tombs and disfigured with many monuments." Now the question will certainly occur to some persons (it was already put in our columns by Mr. Tarbuck, in the 1884 correspondence), will people have the same sentiment as to burials and monuments in a new chapel only connected in a rather round-about way with the Abbey, as they have had about burial in the Abbey? We rather doubt it. There has been for many generations, as Sir Lucius O'Trigger puts it, "very snug lying in the Abbey," but would it be thought equally so in a modern appendage of the kind proposed, more especially if it were (as we fear it would be) built with due regard to economy of cost? Is it not possible that the charm of sentiment and association connected with the idea of being memorialised in the Abbey would be broken?

Taking everything together, then, though we do not attach too much importance to the archaeological consideration of the effacement of the ancient landmarks on the site proposed, we think that consideration, joined with the practical one of the unavoidable demolition of houses that are of some interest, and that cannot be so conveniently placed elsewhere, is sufficient to have considerable weight against a scheme which will probably not be satisfactory in itself. If it were likely to be so, we should not weigh the old associations much in the scale; but it is in our judgment likely to be unsatisfactory in several ways; it will result in an architectural combination, awkward and ill-balanced, and injurious to the effect of the Abbey; there will probably not be enough money to be had to carry out so large a building in the sumptuous style which its position and purpose demand; and its connexion with the Abbey church will be by no means so close and intimate as to lead to its being generally regarded and felt to be a portion of the Abbey itself.

And this last consideration brings us to the suggestion which we should make in reply to the question, "What would you do?" For we by no means wish to enter into merely negative criticism. Our opinion is that the necessity for such a scheme has not yet arrived. The cloister at Westminster is a far more integral portion of the ancient building, both in regard to position and association, than any such new addition as that we have been speaking of can be considered, and our advice would be that before anything of the kind proposed is done, the cloister should be adopted as a *Campo Santo*. The objection that in this climate an open cloister would not be a suitable place for monuments is easily met; glaze the cloister windows. Of course, the cloister could not be available for monuments of such scale as many of those which have found place in the Abbey; but surely no one will regret that.\* On the contrary, the necessity in such a case that a monument should be of a mural or bas-relief character would rather exercise a wholesome restraining influence on taste; and how beautiful and expressive a mural monument may be made, Mr. Gilbert has shown in Westminster Abbey itself, in his beautiful monument to Fawcett. Further

\* It should be added that the cloister is, we believe, already a good deal occupied with graves but not with monuments. The actual graves might be in the girth.



more, for monuments other than mural, and of different kind, the cloister-garth itself might be used, though we should see that with more reluctance, and would rather say with George and, "Laissez la verdure."\* Lastly, there is the further resource of forming a new cloister of a similar kind in the angle of the nave and north transept. The Dean refers to such a scheme, and objects that it would spoil the view of the Abbey from the north. We do not see the force of the objection. The north side of the nave is nearly all restored work, and not of the highest interest or beauty; it is a more important point is that the insertion of a cloister, or a building of that nature, within the re-entering angle of nave and transept, affords a perfectly rational and harmonious architectural combination: it can be made to group with, and appear part of, the general design, while being properly subordinated to the main building; while the manner in which it is proposed to tack on a large new building at an angle of the Chapter-house is architecturally unnatural; it must inevitably appear an after-thought and an excrescence. We say add that in either case, whether in the utilisation of the existing south cloister, or the formation of a new north one, the cloisters, if glazed, could be thrown so completely into combination with the nave as to realise the feeling that they are part of the church, in a manner which could never be attained by the new chapel in the position proposed.

If it ever be indeed determined to build a Campo Santo, or consecrated Valhalla, in a manner worthy of the nation, the true place for it would be, however, not in an angle of the Abbey precinct, but on that now nearly waste piece of land, calling itself a public garden (and sometimes, it is true, occupied by a lounge or two or a stray nursemaid), at the south end of the Houses of Parliament. There might be built a park and temple of the honoured dead, overlooking the ancient Thames on whose banks the greatest capital in the world has clustered, and close to the great building which is the outward home and symbol of our national Government. Something, and, indeed, might be made out of that; but for such a project we must wait till Commissioners of Works are disestablished, and till modern English Parliaments learn the lesson, which ancient ones knew, that there is something greater and more glorious in the life of a nation than economy.

## THE CENTRE OF FLORENCE.

BY AN ITALIAN ARCHITECT.†

THE Municipality of Florence had already decided, several years ago, to set in order the central part of the town, and thus demolish all the vast zone of ancient buildings, and change for hygienic motives, into large streets, with cleaner and more comfortable houses. The rectangle formed by the area to be demolished is comprised by the "Via Tornabuoni" at the north, "Via Calzauioli" at the south, "Via Cerretani" at the east, and "Via Porta Rossa" at the west.

The "Mercato Vecchio" forms the centre of this region, a spot which reminds one of the most primitive history of Florence. The story of this ancient part of the city is bound up with the history of Florence between the twelfth and fifteenth century, and is still presented to us by buildings which are in themselves proofs of the power and influence of its owners, and recall to us the families and persons who acted the principal parts in the leading events of Florentine history.

It is almost impossible to enumerate all the Mediaeval monuments still existing in the quarter of the "Mercato Vecchio." The Mediaeval Florence of Dante's period still exists intact, as it was in his days; the streets

narrow, winding, and having on both sides either stern-looking palaces or high towers, belonging either to the Guelph or Ghibelline nobles. It will suffice to mention the illustrious families of the Lamberti, Della Cosa, Sassetti, Amieri, Caponsacchi, Medici, Strozzi, Catellini, &c. Many of these families are mentioned by Dante in the XVth Canto of the "Paradiso," where the poet records his meeting with Cacciaguida, with whom he talks about the old Florentine nobility.

These are not the only facts that recall to us the buildings of that part of the town. The residences of the Arti della Seta, dei Linaiuoli, dei Medici e Speziali, dei Beccai, and other monuments, are still there, and give testimony to the wise commercial and industrial organisation, the social and religious history, and the habits and customs of the ancient Florentine population.

I have myself (accompanied by the Government's Inspector of Excavations and Monuments, the learned Signor Carocci) found, although hidden and transformed by the modern plastering, all the Mediaeval towers still existing in a good state of preservation. As a rule, the Mediaeval buildings have survived well, except the last floors. None of the towers are as high as they used to be, and none preserve the Guelphs or Ghibellins' battlements, owing to the decree passed by the popular Government, prohibiting that the towers should be higher than 50 "braccia," hoping thus to restrain the building ambition of the nobles.

Both towers and palaces are built with a stone called "pietra forte," which used to be cut in blocks, keeping the external part unpolished, and this latter peculiarity greatly aids in giving that stern and severe aspect which belongs to the Mediaeval Florentine architecture. Generally doors and windows are of a Gothic style, but a little modified. Many of the palaces are very interesting to architects, owing to their peculiar architectural character, their original and fine decorations, and their richness and good taste in ornaments.

Having now slightly alluded to the history of the quarter of "Mercato Vecchio," I will resume my account as to the project for reconstructing the centre of Florence.

When the Municipal project was announced by the public authorities, it was received with delight by many builders, engineers, constructors, and speculators,—in a word, by that class of people who are now invading every town of Italy, in eager search for gain, trampling and crushing everything, without troubling themselves about the memories and glories of Italy. These illiterate and uncultivated people, who only look to their own profit, would not hesitate to destroy the Colosseum, the Duomo of Florence, St. Peter's at the Vatican, and the Loggia dei Lanzi. It is deplorable to think that Italy does not take proper steps against these speculators. The Government only has any authority over the Municipalities, and ought to exert it in this case. Many persons have done their utmost, either through the press or private influence, to protest against the wretched project of the Municipality; the struggle has been long and vigorous, and, indeed, continues still, but against strength reason avails not, and the admirers of art and lovers of history have been doomed to disappointment after their vain complaints. The destruction of the "Mercato Vecchio," and of all the centre of Florence, will be a shame never to be forgotten by the members of the Florentine Municipality,—a shame which increases with the time, and future generations will in vain look for the noble monuments, reminding us of the past glories of Italy, which we have had the fortune of seeing,—will, instead, find modern galleries, covered by glass, badly proportioned porticoes, devoid of architectural principles; of which the modern Bourse forms an example. The ostensible object of the Municipality in setting in order the centre of Florence was that of sanitary improvement; but this end might very well have been attained without destroying so many historic palaces. It would have sufficed to have demolished the Ghetto

quarter, composed of dirty narrow lanes, filthy little squares, and old, fetid houses,—and in its place to form a large and fine garden, which would have been a great gain to the recreation and health of the population, and rendered the air purer.

The rest of the quarter of "Mercato Vecchio," which retains perfectly the characteristic Mediaeval aspect, ought never to have been demolished. It would have been enough to have made a good drainage system, to give a copious supply of water, to shut up many narrow and dirty lanes, to reduce into courtyards many squares, and greatly diminish the number of poor people who live in that part of the town by building outside the town a workmen's quarter consisting of new, healthy, and cheap houses.

New streets might also have been opened, but only through those parts that are less ornamented with monuments and palaces, and the existing buildings could be utilised, restored, and made convenient and sightly; thus some streets of a thoroughly Mediaeval Florentine character might have been obtained. These, and these only, are the works which require to be executed in the centre of Florence, and this opinion is shared by many Florentines who love their city and wish to guard its artistic treasures. We must repeat that the project presented to the Municipality does not provide for the practical wants of the town, and especially for those of the poorer classes; it is set on foot by speculators and entrepreneurs on the look out for their own advantage.

The demolitions have begun in the square of the "Mercato Vecchio," on the spot occupied by the ancient *forum vetus*, where once rose the ancient *capitolium*, adorned by temples and statues, and surrounded by very strong walls. The so-called column "Della Dovizia" (see illustrations in this number) has already been demolished; it was raised in the first half of the fourteenth century, and upon it stood Donatello's statue of the "Abbondanza" or "Dovizia." In 1721, the statue having been shattered by the frost, another one, by G. B. Foggini, was put in its place. Into this column two iron bars were fixed; one upheld the bell which gave the signal to the shopkeepers of the market when to open and when to close the shops, and the other was used as a pillory, and thieves were bound to it; according to Landucci's chronicles, this iron was fixed in the column on the 1st of June, 1504.

Up to now, no other monument has been destroyed, but shortly the "Loggia del Pesce" will be pulled down. This was built by Grand Duke Cosimo in 1568, and its architect was a certain Giorgio Vasari (see illustrations). This "loggia," of an elegant form, ornamented with bas-reliefs, representing various kinds of fish, supported by slender pillars, is an original and characteristic monument, if not of great artistic merit. It is now reduced to such a deplorable condition that it is a wonder it still stands.

To the eastern side of the "Piazza di Mercato Vecchio" is the Ghetto, which is now being demolished. It is a lurid, confused, and deformed mass of dirty, small houses, in which no ancient edifice is preserved to this day. Excavations have recently been executed on this spot by the Municipal Commission of Archaeology, under the superintendence of Signor Carocci, and of Signor Landi, a municipal engineer.

The first researches were made in the "Piazza della Fonte," called "Piazza della Tosa" in the Middle Ages, near the ancient Capitolium; but nothing has been found except remnants and fragments of Mediaeval buildings of the time of the Ghibellines, when, winners at the battle of Montaperti, they returned to Florence, and destroyed a great number of palaces and towers belonging to the Guelphs (1262-64).

The recent excavations in the "Via della Nave" brought to light an ancient Roman road, nearly four metres wide, flanked by edifices of Roman origin, on which Mediaeval buildings were raised later on. It is interesting to observe that the Roman road lately

\* George Sand's last spoken words.

† We give this as the individual opinion of an Italian architect and archaeologist, and probably representing the opinion of the more cultivated section of Italians of the present day, on the subject of the proposed "improvements" in the ancient central portion of Florence.



discovered is in the same direction as the first circuit of the walls of Florence. Unfortunately, the researches made on purpose to study the Mediæval history of this part of the town gave no satisfactory results, as might have been foreseen, it being well known that this part of the town, in which rose the palaces and towers of many noble Florentine families, such as the Brunelleschi, Della Tosa, Arrigucci, Medici, Tosinchi, &c., &c., underwent many transformations at various epochs, the principal of which took place in the sixteenth century, when this ample quadrangle of buildings was reduced into a Ghetto by the order of Cosimo dei Medici.

On the contrary, the western side of the "Piazza di Mercato Vecchio,"—where the residence of "Dell'Arte dei Medici e Speziali," the palace "Degli Amieri," and the "Tabernacolo di S. Maria della Tromba" still exist,—is most important.

The "Consoli dell'Arte dei Medici e Speziali" did not, as all the other "Arti," erect a sumptuous building for their residence. They received from the Commune the tower belonging to the "Caponsacchi," a powerful family which came from "Fiesole," and raised an imposing fortress on this spot of the "Mercato," as expressly mentioned by Dante\* ("Paradiso," canto xvi., v. 121).

Dante himself was incorporated in the "Arte dei Medici e Speziali," when the reforms of the State, with a strictly popular intention, ordered all citizens to join one of the "Arti," or to be declared unable to fulfil Government commissions.

On one side of the tower, part of the "Palazzo degli Amieri" is visible; this family, composed of Ghibelline soldiers, always furnished brave champions to its country. Their ancient palace was dismantled by the Guefts, who, after the battle of Montaperti, gradually regained the supreme power. "Foglia d'Amiero degli Amieri" having returned from exile, built, between 1280-1300, the now-existing palace, and a tower of a strong and fine construction, still visible in the modern "Piazza degli Amieri" (see illustrations). The "Oratorio di S. Maria della Tromba, or Tabernacolo di Mercato Vecchio," built in the thirteenth century, was given to be taken care of by "Arte dei Medici e Speziali," which, as we have already said, had its residence near it. The chapel has been changed into a shop, and nothing is left of the shrine except a beautiful ornamented frieze of "pietra serena." Near the "Palazzo degli Amieri" rose the residence of "Arte dei Rigattieri e Linaiuoli" (brokers and flax-growers); this building is ornamented with a very beautiful door and a nicely-decorated architrave, bearing elegantly-sculptured armorial bearings on a field sprinkled with fleurs-de-lis (see illustrations). We learn from the manuscript chronicles, collected since ancient times by the "Consoli dell'Arte," that the building was commenced in 1413, and that many renowned artists, among whom we find the names of Donatello and Frate Angelico, worked at it. Nothing is preserved to this day in the interior of the edifice.

Of all the monuments cited up to now, only the "Colonna di Mercato Vecchio," called the "Dovizia," has ceased to exist.

Numberless other Mediæval monuments, important in an artistic and historical point of view, are scattered here and there in the old quarter of Florence; but my intention was to describe only those which are doomed to be shortly pulled down.

The ancient quarter of the "Mercato Vecchio," when cleansed, restored, and put in order, would have offered the faithful image of a Mediæval town, as Rome and Pompeii are samples of the Latin towns. Visitors could have walked in the old genuine Florentine city, in those very streets which Dante trod, in that city where the Gueft and Ghibelline factions fought against each other for centuries; the birth-place of many Florentines illustrious in science, letters, and arms;

where so many conspiracies were plotted, and where one may say, without exaggeration, that every wall, every stone, records a page of Florentine history. L. B.

## NOTES.

**F**rom a view of the collapse, as it appears for the present at all events, of the Panama Canal scheme, it may be well for those who may be called upon or be desirous to make another effort to carry it through, to consider the history of the progressive statements that have been made as to estimated cost and work to be done. The estimate for the Sealevel Canal, which was brought before the Paris Congress at the instance of M. Wyse, contemplated 46,150,000 cubic metres of excavation, and a total outlay of 427,000,000 francs. In 1880, on a visit to Panama, M. de Lesseps estimated the excavation at 75,100,000 cubic metres, costing 570,000,000 francs, the Chagres dam and the deviations of the rivers at 175,000,000 francs, and the total cost of the work, including 10 per cent. for contingencies, at 843,700,000 francs. This estimate, on Feb. 27, 1880, he reduced to 658,000,000 francs, and in the September following to 530,000,000 francs. In May, 1885, M. de Lesseps informed the Minister of the Interior that he would certainly finish the canal, on the level, for 1,070,000,000 francs. On Nov. 15, 1887, he stated to the Minister of Finance that he was going to introduce locks, and that the work would be completed for a total cost of 1,500,000,000 francs. In the report to the general meeting on March 1, 1888, this cost was raised to 1,700,000,000 francs. The aggregate amount of share capital and loan obligations amounted on January 1 last to 1,967,000,000 francs. Interest has now ceased to be paid, and in the *Bulletin du Canal Interocéanique* of Feb. 2, 1889, M. de Lesseps states that 450,000,000 francs are yet required to be spent in the execution of the works, without any allowance for interest. But the aggregate of 2,417,000,000 francs thus arrived at makes no allowance for the 100,000,000 francs which in 1886 were stated to be necessary for the Gamboa dam. The total cubic quantity of excavation, which in 1879 was estimated at 46,150,000 cubic metres, and in 1880 at 75,000,000 cubic metres, was stated, in a detailed estimate in the autumn of 1886, at 131,000,000 cubic metres. On March 1, 1888, in his report to the shareholders, M. de Lesseps stated that by the introduction of the proposed locks the quantity of excavation then remaining to be completed would be reduced to 34,000,000 cubic metres, or rather less than the quantity actually returned as excavated,—which, up to June 30, 1887, amounted to 37,174,000 cubic metres. In his report of January 26, 1889, however, M. de Lesseps announced the abandonment of locks Nos. 5 and 6, and the consequent lowering of the summit-pond of the canal, as compared with the design adopted on March 1, 1888, by 36 ft. The excavation still necessary, therefore, he put at 35,000,000 cubic metres, for the cost of which he allowed 181,500,000 francs, besides 25,000,000 francs for the provision of new material. The total cost of excavation, in the same report, he stated to have been 12 fr. 22 c. per cubic metre for the average of the years 1884-85, 1885-86, and 1886-87.

**F**ROM the printed report of the discussion at the Surveyors' Institution on Mr. Hunt's paper on Quantities, which has been forwarded to us by the Secretary as far as it has gone (for the discussion was adjourned), it appears that several of the speakers, although they maintain that the quantity-surveyor is working for the building owner, and should be paid by him, practically admit the view we have expressed that the quantities are really taken out for the contractor. Mr. Ashby said he "considered that the quantities were largely, if not primarily, for the convenience of the builder. The building-owner very seldom, if ever, saw the quantities, and the architect

rarely saw them, except in those cases where at the close of the job, he chose to settle the extras and omissions without the intervention of the surveyor. Therefore it seemed that the convenience of the builder was the first object of the quantities, and that it was right it should be so." Further on, the same speaker remarked that "he thought that the history of quantities, so far as he could trace it, tended to the conclusion that the quantity-surveyor was, in the first place, the creation of the builder; else why did the payment of the quantity-surveyor by the builder survive? Why was he not paid directly by the building-owner?" In regard to the responsibility of the quantity-surveyor for inaccurate quantities, the same speaker remarked that "if an auctioneer sold a plot of land as being 100 acres, and it turned out to be only 90 acres, he was clearly responsible to the man to whom he sold." But then, a Mr. Rickman most truly said, the measuring surveyor was dependent on the accuracy of the drawings and specifications which the architect supplied:—

"There were cases, no doubt, in which a perfect set of drawings and specifications were handed to the quantity surveyor to take from, and in such cases he could hardly believe that any responsible quantity-surveyor could make any serious error. The errors which occurred in the preparation of quantities (and there were such errors, greater or less, in every set of quantities) arose from the drawings not being perfect, from the specifications not being complete, from both being altered from time to time as the quantities were being prepared from a larger amount of responsibility being thrown on the measuring-surveyor, and from there not being sufficient time allowed him, as was too often the case. What the quantity surveyor wanted was a set of working drawings and a specification such as an engineer would send out,—such as used to be furnished when he was in his articles,—carefully working drawings with complete details, so that no question would arise in the course of the work, everything being thoroughly described by the specification and provided for in the quantities. With such material to work upon he could not understand any man of moderate education and fair knowledge of building construction making any serious mistake."

That is the plain sense of the matter, and there is no doubt that architects have created unnecessary difficulty by their frequent laxity, and inaccuracy in specifying in these days. Mr. Rickman is to read a paper on "Specifications," at the Institute of Architects, on Monday, and perhaps we shall hear something more from him on this subject, which few people are more competent to treat.

**M.** SALOMON REINACH is certainly a most valuable paper, the *Classical Review* calls attention in the February number (p. 8) to a task he has undertaken which might well appal the stoutest heart. Every one knows that in archaeological work the great initial difficulty is access to published material. Few private scholars possess such works as the Roman "Monumenti Inediti" or the "Comptes Rendus" of St. Petersburg, or even the "Archæologische Zeitung." The market value of the back numbers of the "Monumenti," with text, is now over a hundred pounds, and even at that price complete set is only occasionally obtainable when some well-furnished German archaeologist is good enough to die, and his library is sold. M. Reinach proposes to republish at moderate price a series of these indispensable works, the series to be entitled "Bibliothèque des Monuments Figurés, Grecs et Romains," and the first of the series is actually out, i.e., the "Voyage Archéologique en Grèce et en Asie Mineure de M. Philippe Le Bas," a book now, in its complete form, very rare. But not only does he republish. M. Reinach intends to replace the old drawings, when inaccurate, by new ones and, moreover, to accompany the plates with "des commentaires très sobres." In fact, we shall get a *précis* of the old articles, which were written very often in the diffuse and rambling style popular at the date of issue. Every one will have his own idea as to what works deserve republication; we would content ourselves with an entreaty to M. Reinach, if he is about

\* See also Browning, in "The Ring and the Book"—  
"True Caponsacchi of old 'H ad' the Sack;  
That fought in Fiesole ere Florence was."—Ed.



to republish the great "Monumenti," not to neglect the brief but important "Section Française," and to publish it separately, so that those who already possess the Italian "Monumenti" may supplement their series. The importance of this will be seen when we state that though the British Museum Library, the department of Classical Antiquities, and the Taylor Library at Oxford all possess the Italian "Monumenti," not one of these three libraries have a copy of the plates of the "Section Française." The English archaeologist can consult this work, to which he is constantly referred, no nearer than Paris or Berlin. Further, we trust that M. Reinach will not neglect the back numbers of the invaluable "Vorlegeblätter," of which no complete copy exists in England, probably none in France, and the republication of which we fully believe the public-spirited authorities at Vienna would permit.

THE issue of the first "livraison" of the fifth volume of MM. Perrot & Chipiez's *Histoire de l'Art dans l'Antiquité*, will be eagerly hailed by a wide public. More than a year had elapsed since the fourth volume was completed, and subscribers were beginning to get a little anxious. After writing the history of the Hittites, with which the fourth volume closed, it might, however, have been permitted to the most Herculean of archaeologists to pause and take breath. Certainly the new issue shows no sign of failing strength. The volume is to be devoted to the history of civilisations less remote in date, i.e., Phrygia, Lydia and Caria, Lycia, Persia. The section on Phrygia is likely to excite special interest in Great Britain, as it is a country which a British archaeologist has made specially his own. The authors amply acknowledge their debt to the researches of Prof. Ramsay, only regretting that his able pen was not seconded by a pencil of like dexterity. Unquestionably the ideal explorer must be draughtsman and, we may add, now-days, photographer. Many scholars will share the further regret that Prof. Ramsay's discoveries are not published in separate form. At present they have to be sought for in the pages of not a few periodicals, but this, we may hope, is matter for future intention.

IN the last number of *L'Architecture*, M. Edmond Pottier contributes a letter on Antique Polychromy, combating the idea that a Greek temple was an edifice painted in every part, from the steps to the cornice, which appears to be entertained by some French archaeologists. He observes that no monument, except the temple at Egina, offers traces of colour on the shafts of the columns, and that a comparison cannot be instituted between that case and such a building as the Parthenon, inasmuch as the latter was in marble and the former in porous stone, to which it might have been thought desirable to give a surface finish of paint, or stucco painted, without implying that the same treatment would be applied to marble.

ACCORDING to a recent number of the *Berliner Philologische Wochenschrift* (1889, No. 3), the newly-discovered theatre of the Muses at Helicon bids fair to rival the splendid proportions of the Epidaurus theatre, — the largest so far discovered. Only the stage portion (*scenae frons*) is as yet laid bare; it is 20 metres across, and of the thirteen pillars with which it was once faced there are traces of seven still remaining. The theatre is about five minutes' distant from the Temple of the Muses, which was discovered earlier, and, according to the *Athenaeum* (Jan. 5, 1889), presents striking analogies to the Niké Apteros temple of the Acropolis at Athens. Pausanias, in his account of Helicon (ix. 28 *seq.*), does not mention explicitly either temple or theatre, but he describes in detail the beautiful and fertile (*εὐχάρις*) mountain itself, and the numerous statues dedicated within the precincts; he mentions also several tripods, the most ancient of which tradition said Hesiod had received for a victory with an ode. The excavations are being carried on by the French.

THE Town Council of Edinburgh have acquired sixty-one acres of the estate of Inverleith, at a cost of 33,500*l.*, for the purpose of conversion into a public park. The ground is situated to the north-west of the city, having the grounds of Fettes College to the west, and the Arboretum to the east. It has an easy slope to the south, and commands fine views of the city. On three sides it is bounded by roadways, and, when the contemplated new approaches are carried out, will be easy of access from all directions. It is proposed that a riding track should be formed, so that Edinburgh will thus have its Rotten-row. This new park will supply a desideratum which has long been felt by the "West-enders" of Edinburgh, and will form an additional attraction to that city as a place of residence.

A RECENT invention of Messrs. Randall & Carter, for the preservation of freestone from the effects of weather, was exhibited by them at the Cannon-street Hotel on the 15th inst., in the presence of a large number of architects and builders. Several specimens of well-known oolitic freestones, which had been treated by this process in such a manner as to make their surfaces quite hard enough to be polished, were shown. The process consists of treating the stone with a compound of milk of lime, acetic acid, and cane-sugar (or molasses), which, when applied, soaks into it for a depth of about  $\frac{1}{2}$  in., and produces a slight chemical change, materially hardening it. The stone may either be entirely immersed in this solution, or the latter may be applied to its surface with a brush. The surface is then rubbed to a face with fine grit and allowed to dry, after which it is subjected to a diffused dry heat of from 130 deg. Fahr. to 160 deg. Fahr. in an oven. When the stone to be treated is fixed in position, as in a building, it is stated that the compound may be applied with a brush, either with or without heat subsequently. Although it is admitted that by heating the stone its durability is greatly increased, we think it questionable whether this is practicable on a large scale after it is built up. But even supposing it were practicable, it is very doubtful whether the hardened surface would protect the stone for any great length of time. Experience has shown that, where only a hardened coating has been formed, moisture soaks in, either through the cracks in the masonry or through portions of the surface of the stone itself, rendered vulnerable by the defective application of the preparation, whatever it may consist of. The moisture collects behind the hard coating, and produces a line of weakness, in consequence of which the thin crust flakes off. Moreover, it is absurd to suppose that, because a lime solution hardens a stone, the latter thoroughly resists decay, as has often been suggested. The mere fact of the stone being hardened does not add much to its durability from a chemical point of view, unless the hardening material be acid-resisting. The only effect of the hardening is to render the stone less absorbent, and therefore slightly more durable, for a few years at most. Unless the protective solution soaks also into every part of the stone, saturating it entirely, it is of very little permanent use.

THE brochure recently issued by the London Geological Field Class, under the direction of Professor H. G. Seeley, F.R.S., very clearly shows the nature of the instruction received by its members during the field excursions of the summer of 1888. It would appear that not only is field geology taught in its purely scientific aspects, but that the uses of the various materials found in the quarries, sand-pits, and brickyards visited in the neighbourhood of London are briefly explained. This is decidedly a step in the right direction. To instil a taste for geology in the minds of the public we think it is very necessary to show the beginner the practical applications of the science, whilst this phase of the subject is more useful to the average

mortal than the intricate philosophical problems presented to the more exclusive student. But exceedingly few professors of the science understand this portion of their inquiry, and still fewer lecture upon it; and the architect or engineer desiring to learn something of geology, to assist him practically in his profession, will do well to bear this in mind. Prof. Seeley, however, seems to be fully alive to the importance of the practical application of geology; and has paid every attention to it, so far as the limited number of excursions has enabled him. On the occasion of the excursion to Aylesford and Maidstone, for instance, we find in the pamphlet alluded to an excellent account of Kentish Rag, as exemplified by Preston Hill Quarry, showing its normal chemical composition, weight, method of dressing, and durability; and giving the names of some buildings where it may be seen. We notice a little slip where it is stated that nearly all the churches on the Thames are built of Kentish Rag, an observation not strictly in accordance with fact. In the reports of other excursions, explanations are given of the uses to which chalk is put for dressing clayey soils, making lime, whitening, putty, and Portland cement; whilst the uses of flint in glass-making, and clay in brick-making, &c., are also briefly alluded to. This field class is the only one of its kind, we understand, in Great Britain, and the success attending it is sufficiently encouraging to warrant the starting of other classes with the same useful object, on the same lines, in other parts of the country.

THE last number of the journal of the Architects and Engineers' "Verein" of Hanover contains a report of a paper read by one of the members on the building which, it is said, is to form the model for the mausoleum to receive the body of the late Emperor Frederick. It is a curious little building at a place called Innichen, in the Tyrol, erected in the seventeenth century, by a returned pilgrim, in imitation of the Church of the Holy Sepulchre at Jerusalem. To that church, now better known as the Dome of the Rock or Mosque of Omar, it, however, bears no resemblance, except in so far that the church proper surrounds a small building or tomb to receive a sarcophagus, and has, attached to one side of it, a second church with an enclosed octagonal chancel for the performance of the ritual of the Greek church. The plan shows a narrow vaulted aisle surrounding a nave, square at one end and having a pointed polygonal apse at the other, and covered with a dome, elliptical on plan. The tomb follows the same plan, and has a small western ante-chapel, and a very long, broad step for the accommodation of pilgrims. The detail of the tomb and arcades is Romanesque in character, but the rest of the building is in the style of the period in which it was built. No view or section is given in the journal, but the plan looks as if it might work out to a sufficiently solemn and dignified edifice.

IT appears that some German makers of Portland cement are still in the habit of manufacturing, and selling as "Portland cement," cement mixed with foreign substances, more especially cement in which dolomite (containing a large percentage of magnesia) has been burned to a condition of slag. This adulteration leads to the development of a tendency to swelling, which shows itself even after several years. To put a stop to this practice, the members of the "Society of German Manufacturers of Portland Cement" have published a declaration by which they bind themselves to put into the market as Portland cement only a product obtained by an intimate combination of calcareous and argillaceous substances, as chief constituents, burned to a state of slag and ground to a condition of flour. This declaration does not extend to small additions made with a view of regulating the time of setting of Portland cement, and which may be as high as 2 per cent. Any member who acts contrary to the obligation undertaken by signing the decla-



ration, will be excluded from the Society; such exclusion to be made public.

**THE** proposal to acquire the Craiglockhart Hills, on the outskirts of Edinburgh, as a place of public resort, meets with a good deal of support in the city, and the proposal of the managers of the lunatic asylum in that neighbourhood for the erection of additional buildings connected with the institution, on the eastern slope of the hills, is a good deal criticised. It is contended that the asylum is now practically within the city, and that it would be beneficial in every respect were the present grounds and buildings disposed of, and new ground acquired at a convenient distance upon which new and better buildings could be erected. It is alleged that this could be done without pecuniary loss, as the grounds of the asylum would fetch a large price for building purposes, and that more convenient buildings could be erected on the new site,—those at present in use not being, in every respect, what they should be.

**THE** old "Town Book" of Belfast, containing many historic records of interest, is to be published, edited by Mr. R. M. Young, of the firm of Young & Mackenzie, architects, of Belfast. The volume will be accompanied by illustrative notes, views, maps, and facsimiles of various kinds. The edition will be a limited one, issued for subscribers only.

**LAST** week Mr. Walter Crane delivered the prizes at the Cambridge School of Art, and made an address to the students, urging an increased direction of study towards applied art. In the course of his address, he observed "that he saw from the report that the committee thanked the Corporation for colouring the walls of the school, and he thought it would have spoken well for the school if the students had cultivated their decorative talents by colouring those walls themselves;" a practical hint on art-education which is worth noting.

#### THE ROMAN THERMÆ.\*

BY PROFESSOR ATTCHISON, A.R.A.

IT seemed to me that all we could learn from the Roman Thermæ was not exhausted in my former lectures, so I propose continuing the subject in this.

Thanks to the intelligence and industry of Palladio, we have his restored plans, elevations, and sections of the back part of Agrippa's Thermæ, and of what remained in his day of those of Nero, Titus, Trajan, Caracalla, Diocletian, and Constantine.

The little mason's lad of fourteen, whose intelligence attracted the attention of the poet Trissino, while his house was being altered (just as our Ware, the chimney-sweep, attracted the attention of his patron, who afterwards built Chesterfield House and translated Palladio), was destined to become the greatest architect born and practising in the sixteenth century; and so early did his talent for architecture develop itself, that at twenty-three his portrait was painted by Bernardino Licinio, with the square and compasses in his hand, the ring on his finger, and clad in the scarlet doublet and the open cloak trimmed with fur, with the inscription in Latin of Andrew Palladio, architect, twenty-three years old, 1541. This portrait is believed to be in Her Majesty's collection.

When we consider that he designed and saw carried out more buildings than any other Renaissance architect, without speaking of his designs for temporary theatres, triumphal arches, and machines, the illustrations he made, and the books he published, we can only be astonished at his marvellous industry in measuring, drawing out, and restoring every Roman ruin he met with, not only in Rome and Italy, but in the South of France as well.

It is to be deplored that the researches of Lord Burlington, of Cameron, Bertotti Scamozzi, Temanza, and others for the text were fruitless, for we can have little doubt that it was prepared and ready for publication with the drawings.

\* Continued. Being the Fourth Royal Academy Lecture on Architecture this Session, delivered to the students of the Academy on the 7th inst. For the previous lectures see *Builder*, pp. 86, 163, 121.

Palladio's industry in studying the remains of Roman antiquity was not thrown away upon himself, for the grandeur of proportion in his buildings has been the test of his works when the authorship was otherwise doubtful. Mr. Penrose, who has measured some of his works, as well as the remains of antiquity, says he is the only modern architect who ever equalled the ancients in excellence of proportion.

We owe him undying gratitude for preserving the records of the grandeur and magnificence of Roman buildings. Since his day many of them have been swept from the earth, so that not even the ruins remain. Let us not, too, refuse our meed of gratitude to the illustrious Lord Burlington, who searched for, found out, and published these priceless records, for, not to speak of the chances of "time, war, flood, and fire," a few more years of neglect might have consigned these drawings to their fate, either to furnish a kite-tail or to light a fire. I must, however, say that Palladio's restorations must be looked on more as an exercise for himself than any deliberate attempt to restore them as they really were; for instance, when he has shown four equally-spaced columns on the plan in several corresponding openings, and he thought the elevation looked monotonous, he did not hesitate to turn some of them into Venetian windows, with the central space double the side ones. He also had a bad habit of not putting ticks to his dimensions, and of treating the thickness of walls as of no importance, and if he used three different measures he leaves us to find them out.

The study of comparative architecture is as useful to the architect who aims high, as the study of comparative anatomy to a physiologist, for it enables him to see how the new needs are met, while still adhering to the main formula; and also how the requisite accommodation could be got on ground of different proportions.

It exercises our ingenuity in trying to solve the riddle of the reasons for which the new forms were adopted, and offers us the means of tracing the gradual evolution of new principles of construction that were to culminate in the Byzantine style; which, again, gave rise to other styles more divergent and perhaps even more daring. It shows us how the Roman architects dealt with buildings on a grand scale, and that, too, when nothing was used in their construction but the commonest materials,—rubble and concrete. Every part was built of rubble, faced with a skin of brickwork, except where great strength was wanted at isolated points, and this was met by isolated columns of porphyry, granite, or sound marble.

This last expression may sound curiously to your ears, but one of the large French marble houses put up a notice "that all flowered and figured marble for sale is pieced, cramped, masticed, and stopped, as is the usual custom of the trade"; so if you should ever want marble columns to carry walls or vaults, and not leath and plaster, you must be careful to choose marble that can be got sound of the diameter and length wanted. M. Charles Garnier had all his marble columns at the Opera House, that were to carry weight, tested with the hydraulic press.

I will now revert to the Thermæ, and treat them chronologically, beginning with the Thermæ of Agrippa, said to be the first Thermæ that were built in Rome, i.e., buildings combining gymnasia, and perhaps palestra, with baths.

We were bound to begin with the most perfect specimen that remained, so as to get as clear an idea as we could of the uses and collocation of the parts, just as a comparative anatomist would begin with an extinct animal, part of whose carcass was found preserved in ice, when he had nothing but the skeletons of the other members of the family. We must not forget, either, that Agrippa's Thermæ are the original type from which all the others at Rome merely differed. These have many claims on our attention. Perhaps the most interesting question in connexion with them is whether they were the first built in Rome; and, if so, where the model was got from, for we can hardly imagine that a plan so complete was developed at once, combining as it does in the centre block the Greek gymnasium and its baths, with hot and swimming baths. Vitruvius is believed to describe the gymnasium of Naples in his account of the Palæstra.

I do not think there can be a doubt that the Pantheon was originally built for the Laconicum of these Thermæ; though Professor Middleton

says no hypocaust was found, and no vertical flue-pipes, and nothing but a drain from the gully under the eye of the dome. Lazeri believes it to have been a bath, as well as the building usually called the Temple of Minerva Medica.

And we know that when it was determined to turn it into a temple, Agrippa proposed to dedicate it to Augustus; Augustus refused, and it was then dedicated to all the Gods, the statues of Augustus and Agrippa being put into the niches under the portico. On the frieze of the portico there is an inscription stating that Agrippa built it. It is not to be believed that the Pantheon was domed and the scaffold struck until after Vitruvius wrote his book, or he would have mentioned it, for though considerable vaults must have been turned for the aqueducts before Vitruvius was born, he does not say a word about centering or the devices resorted to for turning arches and vaults cheaply. Arches, however, could not have been very common in his day, one would think, because he describes them as consisting of wedges, whose joints radiate to the centre, and remarks that outer piers must be thicker to prevent them being pushed out by the thrust.

The next point to be noted is this, that the upper half, which is alone shown by Palladio in Cameron's book, seems complete. When the circular laconicum (the Pantheon) was taken from the baths, what room was used in its place? We have the two peristyles with their ephæbia, the two front entrances to them, with the halls, and the two side entrances, the four rooms on either side the centre of the back front, only according to Palladio there is no entrance to them but from the grounds. Taking the front, we have the tepidarium, with its four recesses for baths and its transepts, the eight piers forming strong abutments for the vault with a vast semi-circular exhedra at each end, two swimming baths, and two rooms beyond the upper exhedra of the tepidarium, the first, probably the cella media, and the further the *concamerata sudatio*.

B. Peruzzi made a design for the Palæce Pitagaliano of the site of the lower half, and in this plan he shows a grand laconicum, but to what purpose the rooms around it were put we know not.

This second block looks like a separate bath, possibly for women, for, if not, there was only one circular laconicum, which is awkwardly situated for the upper baths, for it seems as if you had to pass from the tepidarium into the open air to get to it. Professor Middleton believes this lower circular laconicum was built by Septimius Severus; we know from an inscription on the architrave of the Pantheon that it was restored by Septimius Severus and Caracalla. Baron H. De Geymüller believes that B. Peruzzi, in his drawing of the ruins, which includes a line of columns in the piers of the upper part, also indicated a circular room in the middle of the tepidarium, which Count Nispidi Landi shows. I have had it dotted on in red, but it would utterly destroy the magnificent effect of this vast hall,—164 ft. long, 68 ft. wide, and 90 ft. 10½ in. high (in this case Palladio gives the height to the crown of the vault), and would make the entrance part of the tepidarium very small,—I am inclined to say insufficient,—for, excluding the semi-circular exhedra, which Palladio shows as separated from the tepidarium by unroofed passages, there is only one hall about 57 x 68 ft. cut off from that at the other end by the laconicum, for you will observe on the plan there is no other way of getting to the farther end except through it, the swimming-baths, or from the gymnasium.

As to the columns in the swimming-bath, we know that at Nimes the Roman bath has columns in the water.

At Agrippa's baths, Palladio does not show the columns drawn by Peruzzi, but shows the swimming-bath open. If these aisles of the swimming-baths were vaulted on the columns, the light could not have been very good, unless, indeed, the vaults had hypæthra.

As these are, in point of time, the first, it may be well to see in what points Caracalla's differed from them. To begin with the gymnasium first, we see the entrances have a room beyond the apses of the entrance hall at one end and three halls at the other; these may have been apodyteria.

The peristyles of the gymnasium went right round, i.e., had a cloister all round instead of on three sides only, as at Caracalla's; and on the other side of the gymnasium there is one long



and one nearly square room, which we suppose were an elaothesium and a conisterium, and from it there was a portico to the swimming-baths, although they could be got at from the gymnasium and from the tepidarium. In the four back rooms, got at only from the grounds, Palladio shows three vaulted, and the one next to the tepidarium open; while on either side of the cella media are two rooms or courts shown vaulted, as well as the room called by me the cella media, though this does not stand for much, as the big oblong hall, shown without vaulting on the plan, is shown vaulted with groined vaults in the section.

The upper piece of the bath shown by Palladio is not much less than the central building of Caracalla's bath; as it is 641 ft. long, by 318 ft. deep, while Caracalla's is 716 ft. by 187 ft.

The next that Palladio gives are those of Nero. We know from Martial that these were excellent, for he says, "Who could be worse than Nero: what better than his baths?" (lib. 7, p. 33). And they are spoken of by contemporary writers as the best, for the baths of Trajan are only said by Statius to be equal to Nero's. Seneca's diatribes against the costly things of baths are supposed to apply to those of Etruscus and Nero. Though from the possession of Augustus to the death of Nero there was only about ninety-five years, changes in the fashion of bathing and in the use of the baths and gymnasia may have taken place. Nero was a great admirer of the Greeks, and patron of the fancy. In this case we have a swimming-bath in the centre; it is said that Nero introduced sea-water as well as the aqua solifera, but these waters were possibly only supplied to the solia, labra, or alvei. On the side of the swimming-bath, which Palladio shows open, were the peristyles of the gymnasia, but the ephebia are semicircular exedrae; it is said the exedrae of the philosophers were so near the games that, when people got tired of the noise of the philosophers, they could listen to the clink of the quoits. Three small chambers are on one side of the ephebia, and four on the other. Two of each are possibly elaothesia and conisteria, but whether the coryceum was still in use we now not, or whether the other rooms were nail baths.

Beyond the swimming-bath we have the tepidarium, about 132 ft. long, 66 ft. wide, 93 ft. high to the centre of the vault, with the usual stairs and abutments; and in front of that three successive chambers, but no circular conicum; and in a line with the nave of the tepidarium are two large halls, each 134 ft. long, 61 ft. wide, and 61 ft. high, with a shallow portico beyond the end of each.

Palladio shows these halls as vaulted with two tiers of quadripartite vaulting, and without columns. The question is, what were they used for? I can only suggest for playing at the little ball; for the younger Pliny says in describing his Tuscan villa that his tennis-court was over the undressing room. Galen, in a treatise on the little ball, does not say where it was played. On the lower side of each of these halls is a very long, narrow, vaulted room, with a square one at each end, and another oblong room communicating beyond; they may have been undressing rooms, or they may have been for the sea and sulphur baths. I have not met with any account of a library in the Thermæ until Diocletian transferred the library to his Thermæ.

If we had the ruins now, or even a good contemporary description, we could have had the negative evidence of not finding sunk baths or the remains of labra, and the presence or absence of pipes to suggest their use. Professor Middleton decided that the rooms, two storeys in height, in front of Caracalla's Thermæ were not baths, as no pipes to them were found.

The four rooms on either side of centre of the back front are there, but there are no oval rooms among them, and there are a set of four smaller chambers at the back of them and communicating with them; but what their use was, unless as undressing rooms, we cannot even conjecture. The four rooms can only be entered from the grounds, except that the large room at each end communicates through a small room with the shallow portico at the sides of the halls that are prolongations of the tepidarium.

Modern restorers, Cameron and Blouet to wit, give us sketches at least of the ruins, but in this case we have nothing but the bare restorations of Palladio. The small chambers by the

exedra of the gymnasia are shown by Palladio as having no entrances. I spoke of them as elaothesia and conisteria, so if he be correct we can only imagine them to have been cisterns.

In looking at the back of these Thermæ, we see an oblong block, with a semi-circular portico in front, and each of the square lumps on either side of the portico contains two rooms and a staircase. Was this a portico for shade, or a sudatorium in lieu of the laconicum? Beyond it, towards the tepidarium, is a long, narrow room, with apses at both ends, and a way through the middle. The room was 72 ft. long and about 20 ft. wide, and beyond this is another vaulted chamber, from which you enter into the transept of the tepidarium.

The Thermæ of Titus had, I think, without doubt the swimming-bath in front. But until we know from excavations whether it extended as far as the line of the open porticoes, its restoration is mere conjecture. The tepidarium is of the usual shape, 164 ft. long, 70 ft. wide, and 92 ft. high, with the ends of the transepts cut off by screens of columns. Beyond the screen at the north end is an apse abutting on the piscina, with an opening into it. Beyond the south transept is a long chamber, 34 ft. wide, with apsidal ends very like the caldæ lavatio, or it might even be a laconicum; and beyond this the vaulted room or portico projecting beyond the back front, like that in Nero's bath, but the only communications between the two are through two open areas, with one opening in each into the laconicum or caldæ lavatio, and another into the chambers to the right and left. On either side of the before-mentioned laconicum there are three rooms only, instead of the usual four, but one in each set has segmental ends, probably the sun-bath. These rooms are only to be got at from the grounds and from the laconicum. There are the two peristyles, one at each end, with vast semicircular exedrae as ephebia, as at Nero's—probably with the dust and oil stores at the sides. The only entrances Palladio shows to the gymnasia, except from the tepidarium, are through two circular chambers, about 82 feet in diameter, with descending steps all round. These circular chambers are contained in two square towers, flanking the front with four doors, one communicating with the peristyle, one with the piscina, one with an open arcade, and one with the grounds. I went there twice, but could not get in. Professor Middleton calls them laconica, but if they were laconica they are very awkwardly situated, and without knowing whether there were flue-pipes, their use cannot be positively determined. From their shape they may have been cold baths,—there is one of this shape at Pompeii,—or they might be rooms for ball-playing,—spheristeria; but in any case, how else could the baths be entered? The most perplexing parts are the five steps down Palladio shows in these circular halls. This depth is enough for a swimming-bath, but there is absolutely no entrance into the gymnasia or bath except through water, for Palladio most carefully shows in his section the two shallow porticoes at the sides of the piscina where we should look for entrances as having no doors; and if these circular chambers were the entrance, why were there steps? Apparently there are no apodyteria; the two little dark chambers between the baths of the tepidarium and the courts of the laconicum may have been oil and perfume stores. Canina only makes confusion worse confounded.

We know that Martial bathed in those of Titus, and had to trudge through the mud from the Pantheon there, when he left a wealthy patron at or after the tenth hour (four o'clock). (Lib. 3, epig. 36.)

We naturally ask why he should do so. Was it solely to be free from his patron? was it because his friends bathed at Titus's Thermæ? because it was nearer home? or because it was cheaper? Half a farthing seems very little, but we read that the cost of living at one time in North Italy was only a halfpenny a day, so that the price might have been equal to 5s. of our present money. And we know that Martial was generally short of money.

Immediately adjoining these are baths built by Trajan, according to Professor Middleton, for women only. Palladio calls them the Thermæ of Vespasian, and Cameron the Thermæ of Domitian. They greatly resemble the men's baths, and were evidently of two stories, from the large number of grand staircases. The ground-floor, which Palladio alone gives, shows them without a circular laconicum, or a

grand stand, but with two gymnasia and an ephebeum to each.

We know from Martial and Juvenal that some of the fair sex of those days by no means coveted the usual laudatory epitaph on a Roman matron, that "she stayed at home and spun wool." Some of the more Amazonian ladies not only went through the gymnastic exercises and fenced, but entered the arena and killed lions,—at any rate, in Nero's days. They, too, raised the ire of the Roman writers by being blue-stockings, just as the learned ladies in the days of Queen Anne enraged the poets, and were satirised by them.

"Though Artemesia talks, by fits,  
Of councils, classics, fathers, wits;  
Reads Malebranche, Boyle, and Locke;  
Yet in some things methinks she fails:  
Twere well if she would pare her nails,  
And wear a cleaner smock."

So have I seen, in black and white,  
A prating thing, a magpie bright,  
Majestically stalk;  
A stately, worthless animal,  
That plies the tongue, and wags the tail;  
All flutter, pride, and talk."

Pope, "Artemesia."

To continue the description of these baths, there are three back rooms without the oval one, though the last room at each end has a flat apse.

These baths are almost close up to the road, according to Canina, and the only entrance from the front is into the apse of the tepidarium. On the flanks there are entrances from the back of the ephebia, and at one end an entrance from one of the halls of Nero's Golden-house into the apsidal end of the last back room. There is, however, a grand staircase to the grounds at the back from the lower street in the place of the grand stand, and you can enter the baths from the back, a passage running through the middle of the projecting building into a vestibule to the tepidarium. Whether the rooms on either side were laconica caldæ lavationes, or swimming-baths, we know not. One room might have been a laconicum, or a caldæ lavatio, and the other a swimming-bath, and I have ventured to show it so.

In this bath of Trajan it is well worth observing how the rooms are made to fit where they abut on Nero's Golden-house, some of the rooms of which, standing at a different angle, are entered from the grounds and halls.

It is unnecessary to go through the Thermæ of Antoninus Caracalla again, though we must not lose sight of the fact that, in point of time, these are the last but two of which we have Palladio's plans.

In the grounds of Diocletian's baths the grand-stand is a segment, though nearly semicircular, like that at the Thermæ of Titus, and now forms the entrance to the Via Nazionale from the Piazza dei Termini. We must not forget that we enter the church of Sta. Maria degli Angeli from what was the back of the Thermæ, the entrance being in the centre of the apse of the projecting back building, and, after passing through the laconicum and an arm of the transept, we come into the nave of the church in its middle.

The other arrangements of the main building closely correspond to those of Caracalla's; we have a vast swimming-bath in front. The tepidarium, though it has the transepts screened off by columns, looks, with the parts beyond, like a Mediaeval cathedral, with square chancels at both ends. About the use of these ends we are absolutely in the dark. No doubt the ecclesiastical-looking plan of these baths struck Pius IV. (1559-65), when he got Michelangelo to turn them into the Carthusian church of Sta. Maria degli Angeli. Palladio does not give the length of the tepidarium, but it is, from my measurements, about 194 ft. long by 79 ft. wide to the face of the walls, and according to Palladio, 100 ft. high. The floor of the present church is said to be raised about 7 ft. above the old floor, and the nave of the church looks therefore rather squat. Sir C. Barry, when on his travels, noticed the unfortunate spoiling of the effect of the nave by one being obliged to enter it in the middle. At the back of the tepidarium is a circular laconicum, 63 ft. 9 in. in diameter, with a square recess on each side, beyond that again is the projecting covered portico, swimming-bath, or hot-room, the first of which we noticed in Nero's Thermæ. The gymnasia, with the ephebia and halls, are similar to those of Caracalla's, only the peristyle is much longer, and goes right round, instead of stopping at the ephebeum.

There are the four rooms on either side of the laconicum, shown by Palladio to have no



communication with the baths, and to be entered only from the grounds; but, according to Cameron, the end ones communicate with the gymnasia. This bath is said to have accommodated 3,200 bathers. There are two large oval halls, one in front of each gymnasium, 71 ft. 6 in. wide, 110 ft. 6 in. long, the apses at each end being screened off by a colonnade of six columns. The peribolus has vast exedrae halls and palaestras, and a nearly semicircular grand stand, 483 ft. 6 in. in diameter. In front of it stood a column 2 braccia and 18½ oncia in diameter. We can by no means positively assert where the Ulpian library was placed. As I before mentioned, a bell was found in these baths, which may have been the bath bell.

The baths of Constantine on the Quirinal have disappeared to make room for the Quirinal, the Rospigliosi, and Bentivoglio Palaces, though they must have been comparatively perfect in the sixteenth century, for Palladio gives the height to the crown of the vault of the tepidarium, and to the top of the dome of the laconicum.

The entrance to these was from the north, in the centre of a huge semicircular arcaded enclosure, which embraced the whole width of the baths. In the centre was the piscina, flanked on either side by covered porticoes, which are entered in the middle of the length by a doorway to each from another portico, with columns in front next the semicircle. Palladio shows no main entrance to the warm baths, except for swimmers, and the only other entrances are through openings on both flanks, through a series of small chambers, which resemble those at Nero's baths. Before you come to these openings, on either flank are two long chambers, also entered from the flank, about 100 ft. long and 23 ft. wide, whose length equals the width of the two covered porticoes to the swimming-bath. The nave of the tepidarium is 132 ft. long by 57 ft. wide, and 75 ft. high to the crown of the vault. Beyond the end of the tepidarium are two vaulted halls, without columns, as at Nero's baths, each with one apsidal end, and the other screened off by columns from the tepidarium. Each of these halls is 87 ft. long by 43 ft. wide, and 50 ft. high to the crown of the vault, with four chambers on the north side, entered from the hall by two openings. In Palladio's time the connexion between the tepidarium and the caldarium was gone. The caldarium is a building composed of four flat apses, and measures about 51 ft. inside each way; there is just an angle of the square left to show that it was generated on a square of about 37 ft. with apses of 6 ft. 10 in. internal depth projecting from each side; from this the circular laconicum is entered, 75 ft. in diameter, and 94 ft. high to the eye of the dome. On three of the arms of the intersecting diameters of the circle are three circular recesses with columns, projecting to the extent of a semicircle beyond the external circular wall, and marked by four columns, and there are the three chambers on either side of the laconicum, entered only from the grounds; the last one on each side communicates with a circular hall, having one entrance from the grounds and another from an open court, cut into two by the chamber joining the tepidarium to the sudatorium. In each of these courts, besides a projecting shallow portico on the north side, are three rooms, two square and one oblong, with apses at both ends.

The most notable peculiarity in these baths is the absence of the usual gymnasia, which are gone on, though, from the absence of palaestra, all that we can now say is that they had been demolished before Palladio measured the ruins. I may say that, as we have only got Palladio's restorations, and we do not know what state the walls were in, the want of entrances shown may be owing to the walls being removed to their foundations so as to obliterate the traces of openings.

It is to be regretted that some of our modern necromancers, who hold converse with the illustrious dead in English, do not get the gymnasiums, bath-masters, and distinguished athletes and bathers of each epoch to give us an account of how the thermæ were used. I am sure we should get both information and witty remarks from Martial.

I have now completed the description and comparison of all the thermæ whose records have been preserved by Palladio.

On mature reflection it seemed to me better to confine myself to this subject, and to do it

as completely as I could, than to make the lectures embrace all Roman buildings, including palaces, of the use of whose rooms we are equally ignorant, and which have had less influence on subsequent buildings.

For the plans of these thermæ have been fraught with evil for past generations. As the Renaissance architects admired the size and shape of the rooms, and saw that their arrangement seemed architecturally skilful and pretty to look at, without knowing their exact destination, they gave rise to exercises in what was called the academic style. Students were told to make a design for a public building, and if the rooms were only big enough, the shapes varied enough, and the walls thick enough, the building was supposed to answer equally well for any purpose. Thus the very foundation of excellence in architecture was bad, the first point in planning being to fulfil the programme given in the best way possible, so that every room may exactly fulfil its requirements, and that the whole of them may be arranged in the most convenient way for use, have the requisite strength for supporting the superstructure, and, at the same time, be formed into an organised, characteristic, and rhythmical whole. This academic method of planning destroyed, too, not only all the natural character of the building,—for the outside of a building must say something of its use, if each room is of its proper size and height, if the windows are of the right sizes and put in the right places; but it prevented any further character being given to it, for how could the architect increase the appropriate expression if he did not know to what purpose his building was to be applied, whether it was to be a palace or a prison? In going about the country we see some of the effects of this teaching: sculpture galleries and museums are lit by side windows, with the light greatly diminished by a handsome peristyle, while the principal use of the peristyle is to form a shelter for pigeons and sparrows.

Though we should not be ungrateful to the Renaissance architects, who have made us familiar with elegant or dignified proportion, beautiful ornament, and good figure sculpture, we have paid a heavy price for these gifts. By their worship of Roman remains, and by their inculcating a blind imitation of them as the sole means of arriving at excellence, they placed architecture under a worse than Egyptian bondage for more than three centuries, and we are now only just beginning to think freely again, and to believe that the Romans had not exhausted every method of construction, nor every form of beauty, and that the worship of idols, be they Greek, Roman, or Medieval, is not, perhaps, the highest form of worship. As soon as the Romans began to think and act for themselves, they began to develop a new style, culminating in the Byzantine. The new style was hideous enough at its outset, at Diocletian's baths and at his palace at Spalatro, and beautiful enough at St. Mark's.

Thought, knowledge, and ingenuity are as inseparable from good architecture as proportion, rhythm, and character, more particularly in days of advanced civilisation when the requirements are so numerous and so varied; but as architecture is a social expression of the age, i.e., of the wants and likings of the people, we can never have a real style until there is some general agreement in what they like.

The main use of lectures is to stimulate enthusiasm, to point out new methods, or old ones that have been overlooked, and to draw attention to deficiencies.

It is needless to raise enthusiasm for the construction of buildings of colossal size and great durability, as architects ask for nothing better to do; it lies not, however, with them, but with the public to have grand and magnificent buildings to hand down the memory of our age and country to remote posterity.

These ruins of the Roman thermæ still appeal to us by their size and durability,—a durability that has braved earthquakes, neglect, and wilful destruction for 1,600 years, and in some cases for nearly 2,000, and gives us no mean opinion of the capacity and skill of the architects, the organising power and integrity of the builders, the skill and care of the workmen, and of the wisdom and grandeur of the emperors, for each emperor vied with the republic or his predecessors in constructing grand and enduring monuments for the health and gratification of his subjects.

In those days architecture, if not an honoured calling, was at least a lucrative one. Martial (lib.

5, epig. 57) advises a father to make his dull son an architect, if he wants him to be rich, while now it would be more honest to advise him to give him a broom and purchase him a good crossing.

We hope that English architecture will not always be confined to buildings that are small and perishable. We cannot hope that the passion for immediate occupation and enjoyment will ever be much abated. We are too much like the Romans in character to be deterred from hurry by Fergusson's diatribe on Roman buildings: "These display far more evidence of wealth and power, than of taste or refinement, and all exhibit traces of that haste to enjoy which seems incompatible with the correct elaboration of anything that is to be truly great."

I will only ask the advanced architectural students to apply to themselves Socrates' cross-examination of the young Athenian, who complained he was not made a general; to ask themselves, if they had to prepare designs, and see that a building of the size and complexity of Caracalla's baths, with its gigantic vaults and domes, its enormous water supply, its heating, drainage, and decoration, was to be executed in six years, or answer for the delay with their heads,—whether they know themselves to be equal to the task, and not to complain of ill-fortune until they feel reasonably confident that they could carry it out.

Before leaving the thermæ for another subject, I wish you to observe that in them you have buildings treated according to the most approved modern recipe for architecture, and perfectly planned for their purpose, and with the outside left to take care of themselves; and I think that most persons of cultivated taste would say the back front of Caracalla's bath was common-place, if not ugly, and particularly so if there were no painted enrichment on it. External ugliness, however, had no more terror for the Romans than it has for the bulk of uneducated Englishmen.

I should be sorry to pay so ill a compliment to the accomplished English architects of the present day as to suppose that any of them who had such a building as this to design would not make a much more elegant exterior. I saw in *La Construction Moderne*, a photograph of the restoration of Diocletian's thermæ, by M. Paulin, a French architect, and bearing in mind the peculiar hideousness of the building, as shown in Renaissance sketches, one could not but feel how small was the architectural skill of those days, compared to that of our brilliant artistic neighbours, for M. Paulin has given an air of elegance to his restoration. Even the Pantheon, built at the very zenith of Roman art, is conspicuous for its external ugliness and lack of æsthetic fitness.

It is curious how some of the main interior halls of Caracalla's thermæ have the opposite quality, and are designed, not only for splendour, but have devices for heightening the interest and increasing their architectural effect, so that they not only impress us by their size and grandeur, and satisfy the eye by their proportion, but must have had a certain mystery as well. To instance only the tepidarium at the laconicum: the first not only strikes by its size and proportion, but a certain mystery is added by the rooms beyond and the apses which were screened off by columns, and by the screened transepts, with the fountains in the middle; besides, one of the transepts and the apses had openings into the piscina, or the furnace courts, which must have received a smaller amount of light than the clearstory windows, while the other transept must have been comparatively dark.

The magnificent laconicum, 116 ft. in diameter, is bigger than the inside dome of St. Paul's, and, as far as its lower part is concerned, the recesses must have given variety, while above the gallery formed a pleasing feature, and the domed roof must have had an imposing effect.

When we consider how sumptuous was the whole interior of the building, resplendent as it was with beautiful marbles, glass mosaic painting, and gilding, and adorned with the masterpieces of Greek sculpture, we can really imagine the impression these thermæ must have made on the barbarians who overran Rome. The glories, too, of all these baths could hardly have departed at once, so that the later barbarians and semi-barbarians must have taken away vivid impressions of Roman magnificence. This magnificence they doubtless tried to produce in their own countries. That this must not appear far-fetched, I may tell you that the "oriel window," that very modest enlargement





Incised Design in Bronze on an Etruscan Cista in the British Museum.

to the blank fronts of secular Mediæval buildings, got its name from the golden parlour copied from Rome, the window being merely a convenient recess. So much for the effect of these myths on the barbarians; but their effect on the Roman masses must have been twofold. The very fact of such colossal and gorgeous buildings being devoted to their use, and to that of the strangers staying there, must have impressed each bather with the power, importance, and wisdom of the State. Those who reflected must have thought what must such a State be that can afford such buildings merely for the health and diversion of the inhabitants of its capital. This splendour and magnificence must also have tended to foster that love of richness and colour that was such a distinguishing characteristic of the Romans, as shown in those articles of daily use that have come down to us.

There is in England a grumble that our Board Schools are allowed to have any architectural design bestowed on their outsides, and there is certainly none in the inside. The distinguishing characteristic of English manufacturers is the excellence of their materials and workmanship, and their want of beauty. Where can this love for beauty be better fostered than in the school? Friezes of coloured tiles, some ornamented with foliage and some with stories, and some good carving out of reach, as we say in the roofs and ceilings, and a general tastefulness and agreeableness of colour could, in my opinion, pervade them, if we want our ornamental manufactures either to rival or eclipse those of our tasteful neighbours, the French.

That the interiors of our public buildings are not made beautiful in colour, and adorned with storic painting and sculpture, is a reproach to our country. To show how the best judges are sometimes mistaken in their estimate of the value of the multitude for some fine work of art, tell you this story from Pliny (N. H., lib. 34, p. 19):—Tiberius greatly admired the celebrated athlete strigiling himself, by Lysippus, and thought it was not much cared for by the people, and had this statue removed to his chamber, having substituted another for it at the baths. The people, however, were so resolutely opposed to this, that at a theatre they clamorously demanded the oxymenon to be replaced; and the prince, withstanding his attachment to it, was obliged to restore it, and, according to all counts, he was not a very amiable prince.

#### ANCIENT SCULPTURE IN BRONZE: INCISED DESIGNS.

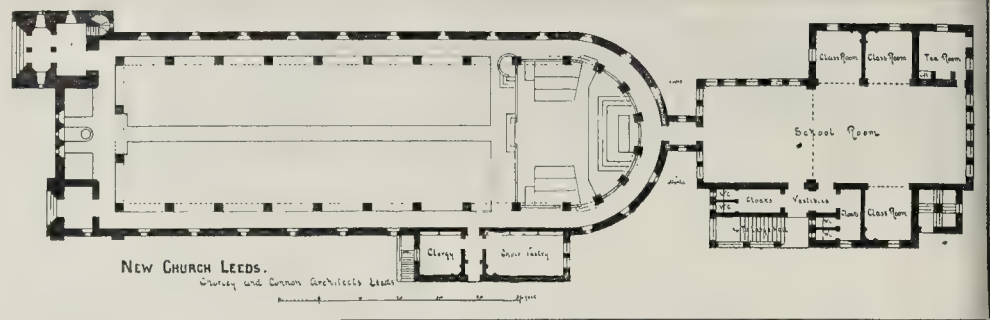
MR. A. S. MURRAY, Keeper of the Greek and Roman Antiquities in the British Museum, delivered the first of three lectures on "Ancient Sculpture in Bronze" to the students of the Royal Academy on Monday evening last, Sir Ederic Leighton in the chair.

Mr. Murray said that in choosing for the subject of his first lecture the art of incising designs in bronze, he had been actuated principally by the desire of calling attention to one of the most recent acquisitions of the British Museum, which was a circular mirror-case, coming on the outside a design in relief, to which relief he would return in a future lecture. As a mirror-case was found at Corinth, and from the quality of the drawing of the group which formed the subject of the incised design on the inside, it was notable for its great beauty. Though we read much of the ancient

Corinthian mirrors, we found very few of them in our museums,—few, at least, having incised designs, and fewer still having drawing such as the one to which he was referring. Another inducement to him to take up this subject of incised designs lay in the fact that the British Museum possessed several other comparatively recent acquisitions of the kind, which were but imperfectly known. He referred particularly to a second mirror and to two bronze cista, which, though perhaps familiar to some visitors to the Museum, had not before now been made accessible elsewhere. The cista, like most others of the same class, were found at Praeneste, the modern Palestrina. The second mirror was Etruscan, from near Perugia. It happened, moreover, that the bulk of incised designs that had survived from antiquity consisted of mirrors and cista, so that the specimens referred to were fairly representative, as well as new and unfamiliar. They were representative also of the two centres where most of the incised designs were found, viz., Corinth and Etruria. There was, however, one respect in which these specimens were not representative. One example from Corinth to three from Etruria was not near the true proportion: one to fifty would be nearer. The Corinthian mirrors or mirror-cases that existed could be counted on the fingers, almost; while the number of Etruscan mirrors so decorated was probably well on for a thousand. In Gerhard's work on Etruscan mirrors there were 429 plates, many of which contained two or more mirrors, and that number had been largely increased by the supplement to that work which was now being issued by the German Archaeological Institute. That book was a mine of mythology and legend, with curious instances of old Roman and Etruscan beliefs. It might have been expected that the proportion would be just the other way as between Corinth and Etruria,—Corinth with its ancient fame for bronze mirrors, no less than for beautiful faces to be seen in them: Etruria famed neither for mirrors nor feminine beauty. Yet the explanation was not difficult to find. We read in Strabo (c. 381) of how, when Corinth had been destroyed by the Romans under Lucius Mummius, the ancient tombs were ransacked systematically for the pottery, bronzes, and other objects which they were known to contain. So active was that industry that a special word was coined to describe the spoils thus obtained; they were called "*neorhynchia*." It was easy to imagine that in those days many incised mirrors found their way to Rome, only to disappear for ever, while others might have been sold to rich Etruscan ladies, to be ultimately buried with them, and perhaps recovered again in our time to swell the number of so-called Etruscan mirrors. Indeed, among the latter there were not a few examples which looked as if they were of pure Greek workmanship, whether obtained in the way referred to or imported fresh from the makers of them in Corinth. Up to now we had no proof that the art of incising designs on bronze was practised at Corinth previous to the fourth century B.C. The existing specimens were of that date,—in some cases perhaps even later. The question, therefore, arose whether that art came into existence at Corinth in the fourth century B.C.? Or, at all events, did it at that date start into a new and beautiful life, and if so, what were the circumstances which led to such an awakening? It should be remembered that Corinth in the fourth century B.C. stood high as a school of painting. To all appearance it had come suddenly into fame through the genius and ability of a

few men. The characteristic of the school was its excellence in drawing, for which it attracted no less a person than Apelles. The mirror from Corinth was just such a work as would be produced in circumstances where artistic attention was attracted chiefly to excellence in drawing. The subject was a nymph seated on a bench beside a fountain. Pan had come to meet her. The scene illustrated admirably the spirit of the Bucolic poetry of Greece,—that poetry which sprang into existence and popular favour just about the times of Apelles. The existence of the fountain was indicated by the presence of a swan, and by the pebbles with which the nymph and Pan were playing. The figure of Eros or Cupid beside the nymph was a reminder that the time in which the artist of this bronze lived was a time when symbols and personifications occupied much of men's minds. The conclusion which the lecturer had arrived at after studying this bronze was that its excellence of drawing indicated that it was a product of the fourth century B.C., and that probably the art of incising designs on bronze mirrors was introduced in Corinth then, and not till then, in which case the comparatively few specimens yet found might be taken as an average of those that might have been obtained had Corinth not been sacked by the Romans. The lecturer then went on to show that from the end of the seventh century, all through the sixth century, and through part of the fifth century B.C., an active intercourse in matters of art was carried on between Greece and Etruria. It could not be doubted that the extensive importation of painted vases, first from Corinth, then from Athens, had acted on the artistic taste of the Etruscans. On those vases there was an overwhelming abundance of Greek myth and legend from which to choose subjects. On one class of vases which the Etruscans seemed to have liked,—the circular kylixes,—they would find the idea of a design disposed within a circular space, while on archaic specimens they would observe a free use of incised lines; so that from those elements lying to their hand, it was not perhaps a very startling piece of originality to take a plain circular mirror of bronze and transfer to it the circular design on a Greek painted kylix. That explanation would, he thought, account for the fact that a certain proportion of the Etruscan mirrors had designs of an archaic character going back to about 500 B.C., or even earlier,—at which time, as far as we could see, there were no incised mirrors in Greece. As an average sample of Etruscan work, the lecturer pointed to the drawing of an incised mirror recently acquired by the British Museum. It illustrated the story of Perseus, and how he cut off the head of the Gorgon Medusa. Coming to the two cista, the lecturer explained that a cista was a cylindrical bronze box, round the outside of which designs were frequently incised. It was a singular circumstance that bronze cista with incised designs had, with very few exceptions, been found only at Praeneste (Palestrina),—a fact which had occasioned much conjecture. At one time these cista were thought to have been used in mystic rites. The phrase "*cista mystica*" became current, and even Gerhard adopted it, though recognising from the contents of the cista that they must have been used for the bath and for toilet purposes. The number of cista now known was nearly eighty. Of these only a small proportion were enriched with designs of any consequence. The most famous, and still the most beautiful, was the one at Rome in the Collegio Romano, known as the "*Ficoroni cista*," from the name of the dealer in antiquities who





first became possessed of it. Apart from its excellent drawing and composition, that cista had an attraction in the inscription on the lid, which recorded that it was made in Rome by one Novios Plautios. The form of the inscription ("Novios Plautios me fecit") made it clear that the artist lived towards the end of the third century B.C. In no other instance had we the name of an artist on a cista. Prænestine, it should be remarked, was not an Etruscan town. It was one of the oldest towns of Latium, and was situated about twenty miles to the south-east of Rome. Rome was, so to speak, its market town, and to Rome probably the citizens sent for the cista which they had left in their tombs. The designs on them were probably such as were popular in Rome at the time, and, if popular in Rome, popular also in Etruria and the rest of Italy, so far as Italy had been subjugated by Rome,—because after that subjugation Roman influence in art spread everywhere. As a rule, Roman influence in art was but a passion for Greek art, and the transplanting of Greek art into Italy. Referring to the incised work of two ciste in the British Museum, of which drawings to an enlarged scale were exhibited, the lecturer said he did not put them forward as good specimens of art, or as the best of their class, but merely to show, by new examples, what that Græco-Roman tendency produced on an average. Whether at Prænestine, in Etruria, or elsewhere, the result was always much the same as we saw it on these two ciste. The first of these [which forms the subject of the accompanying illustration] combines two separate scenes. In the one scene, towards the left, is a group of two combatants, with a winged figure intervening. We had here the scene in the Iliad (III., 355 fol.) where Paris and Menelaus encounter each other. On the left was Paris, recognisable by his Phrygian cap; on the right Menelaus. Between them intervened the goddess Aphrodite, who, according to the story, rendered Paris invisible to his foe by enveloping him in a mist. In another place in the Iliad (V., 290 fol.) there was an encounter between Æneas and Diomedes, which in some respects answered to the other scene depicted on this cista. Here also Aphrodite interfered to save from spoliation her Trojan friend, Æneas, but with the result that the Greek hero, Diomedes, rushed at her and wounded her, causing the divine blood to flow. With regard to the figure of the goddess in the first subject, the lecturer pointed out that the Greeks did not give Aphrodite wings, however invisible they might believe her to be, nor did they think of her as armed with a sword. To the Etruscan artists, however, wings were naturally associated with deities. For some reason the Oriental instinct for winged invisible beings had a powerful hold on them, and in that respect the group on the cista was thoroughly Etruscan. He was, of course, speaking of a time when the Etruscans had ceased to exist as a nation,—when they had become part of the Roman Empire, and had in artistic matters plunged into the stream of the late Greek art which then flooded Italy. The lecturer, in conclusion, described the other incised cista, which, he thought, had for its subject a sort of burlesque or travesty of "The Judgment of Paris."

**Architectural Partnership.**—Mr. J. T. Wimperis informs us that he has, from the 14th inst., taken into partnership Mr. Wm. Arber, who has been with him for twenty-four years. The style and title of the new firm will be "J. T. Wimperis & Arber."

## Illustrations.

### DESIGN FOR A SCREEN IN WROUGHT AND CHISELED IRON.

THIS design, which was exhibited in the Royal Academy in 1886, is by Mr. J. J. Shaw, and was intended as a suggestion that something more might be done with wrought-iron, in the way of surface-modelling and chiselling, than is generally attempted, and that the capabilities of the material are not entirely exhausted in twists and scrolls.

We entirely agree with Mr. Shaw's opinion, which we think he has very ably illustrated.

### OLD FLORENCE:

#### PORTIONS THREATENED WITH DEMOLITION.

We give four views of some of the buildings of Old Florence which are threatened with demolition, under circumstances referred to at greater length in our second article.

### EXAMPLES OF GERMAN TOWERS.

THE drawings showing the centre tower and subsidiary towers of Mayence Cathedral, and the towers at Frankfurt and Heilbronn, which form two of the illustration pages of this number, are reproduced from a work lately published, and still, we believe, in the course of issue in "Paris," by Herr C. Sutter, architect, of Mayence. The book appears under the title, "Thürmbuch,"\* and is a collective illustration of towers on somewhat the same line as the English work known as "Wickes's Towers and Spires." Only two parts of the work are before us, which deal with German examples entirely, including a considerable number of the smaller, but often highly picturesque towers, such as "gate-towers," &c., which are so frequently met with in North German architecture especially. We understand it is the author's intention to include English examples in the progress of the work.

The publication fills a gap in German architectural illustration, and contains a good many curious and not very well-known specimens of tower building, which will be of interest to English architects. Those which we have reproduced we have selected as being among the best examples of the illustrations, the author having suggested to us the publication of reproductions of one or two of the plates in the *Builder*, as an illustration of the contents of the work.

The "Thürmbuch," of which each part contains twenty plates, has been, we believe, a success in Germany; and though German and English notions of architectural drawing differ a good deal, the book is worth attention in this country, for the reasons we have already mentioned.

### CHURCH AND SCHOOLS, ROUNDHAY-ROAD, LEEDS.

THESE buildings are about to be erected to supply church accommodation in a district which has become densely populated during the past few years. They are designed in a somewhat eclectic style, without any close following of ecclesiastical precedent. The plan is an attempt to meet more fully than usual the requirements of congregation and ritual. All the seats are within the nave, and the ambulatory, which runs completely round the interior, lends itself well to processional services. The connexion formed between

church and schools also enables the clergy and choir to assemble in the latter on occasions when the attendance may be greater than could be accommodated in the vestries. The organ chamber is exceptionally spacious, measuring 36 ft. by 19 ft., and proportionately lofty. The entrances are arranged carefully so as to exclude draughts, and to be ample for the ready exit of the congregation. The materials employed are simple, and comparatively inexpensive. The whole of the walls inside and out are to be of red and buff bricks, the woodwork of pitch-pine, and the roof covered with tiles. The architects are Messrs. Chorley & Connon.

### CHAPEL AND SCHOOLS, LEEDS.

THESE buildings are erected on the south side of the river, in a crowded manufacturing district. The site being limited, and surrounded on all sides by thoroughfares, did not permit of the buildings being relieved by projections, so effect has had to be gained mainly by the outline of the sky-line. The fronts are of Horsforth stone, the internal dressings being of a finer-grained material from Morley. The architects are Messrs. Chorley & Connon, of Leeds. The original of the view given is hung in this year's Academy.

### City and Guilds of London Institute.

A course of "Twelve Lectures on Architecture," dealing with the practical side, illustrated by sketches, diagrams, and specimens of materials,\* is announced to be delivered by Mr. Banister Fletcher, F.R.I.B.A., at the Central Institution, South Kensington, on Monday evenings, commencing at 7.15. The dates and subjects are as follow:—March 4.—Architecture (Introductory Lecture). March 11.—Foundations. March 18.—Limes, Cements, and Concrete. March 25.—Brickwork. April 1.—Masonry. April 8.—Building Stones. May 13.—Fireproof Construction. May 20.—Timber, its several Forms and Uses. May 27.—Carpentry (Roof and other Constructions). June 3.—Iron and its Use in Building. June 10.—Plastering and Materials. June 17.—Plumbing and Sanitation. To test the knowledge acquired by those attending the lectures, there will be a written and oral examination at the end of the course. To those who obtain a "pass," certificates will be granted. The Worshipful the Carpenters' Company and the lecturer offer prizes. Further particulars may be had of the hon. secretaries.

**The Registration of Plumbers in Ireland.**—Following the successful meeting lately held in Dublin, and referred to in our last number, an important meeting was held at Belfast, under the presidency of the Mayor. A district council for the examination and registration of plumbers, in accordance with the scheme so successfully set on foot in England by the Worshipful Company of Plumbers, was elected. Amongst those taking part in the meeting were Mr. W. R. E. Coles (Clerk to the Company); Mr. Wm. Gray, M.R.I.A.; Mr. Robert Watt; Mr. J. C. Bretland, C.E., City Surveyor; and Mr. Calwell, C.E.

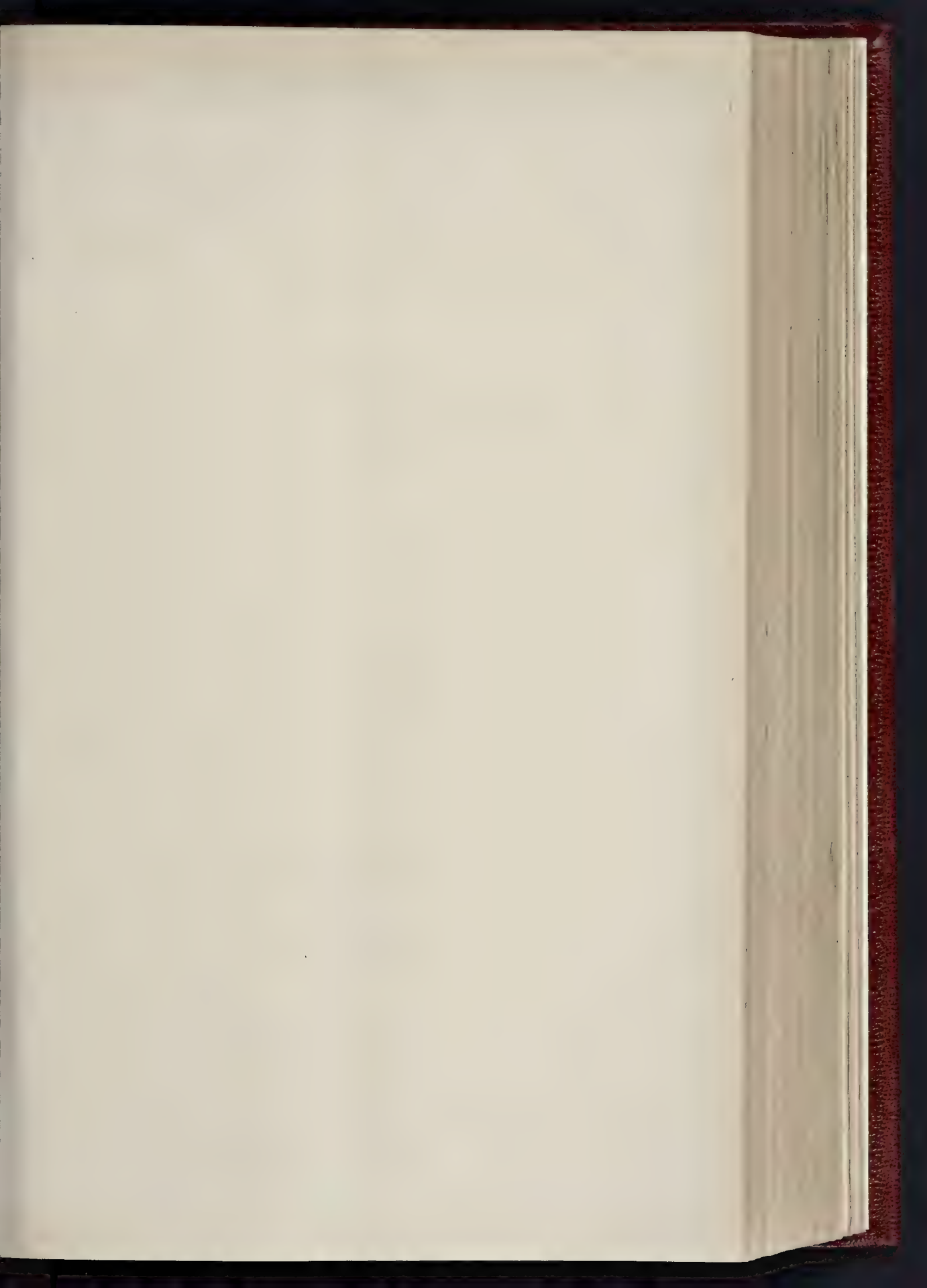
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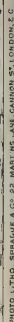
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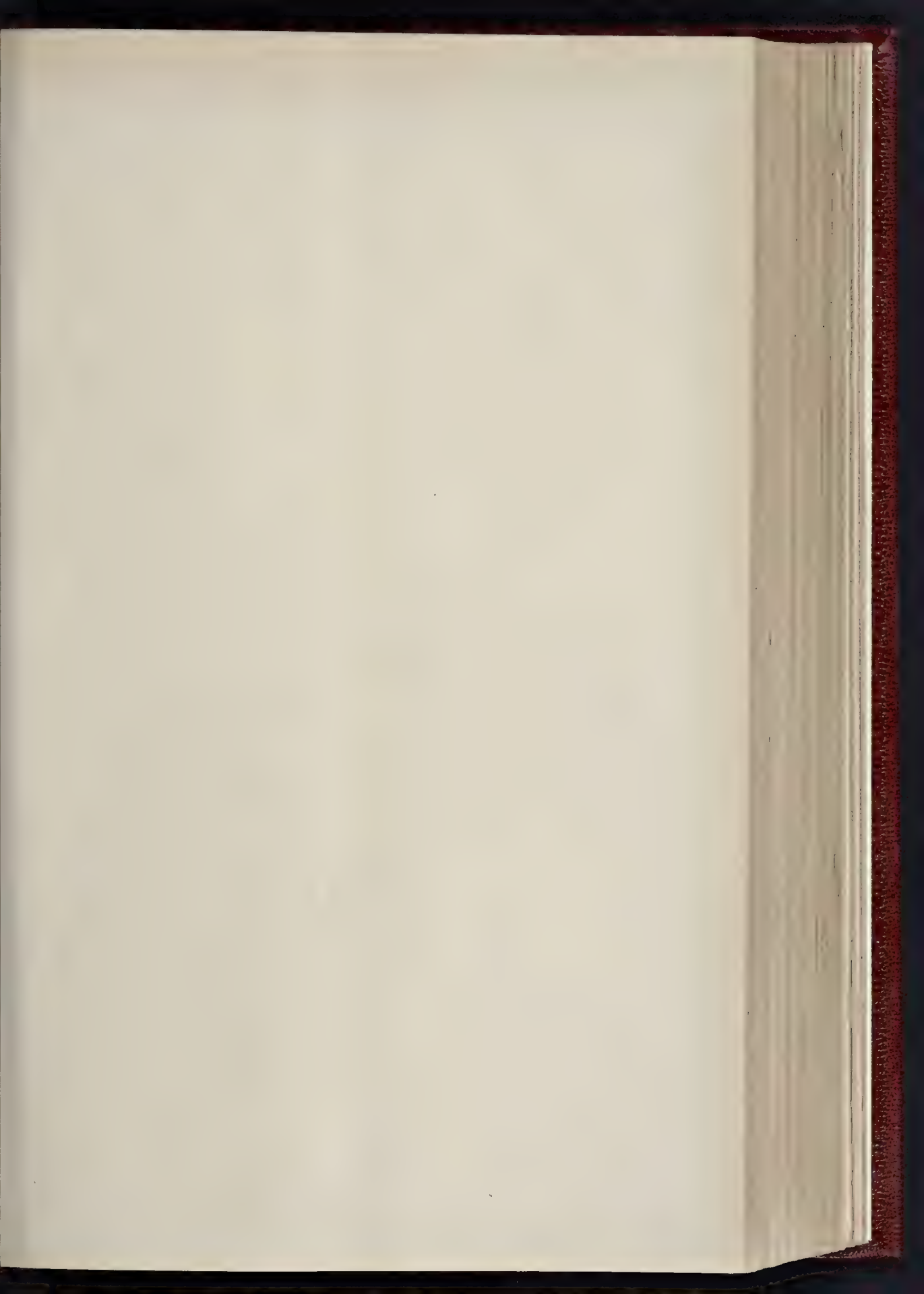
\* Thürmbuch aller Stile und Länder, gesammelt und gezeichnet von Conrad Sutter; mit einem Vorwort von Dr. F. Schneider. Berlin: Ernst Wasmuth; 1888.



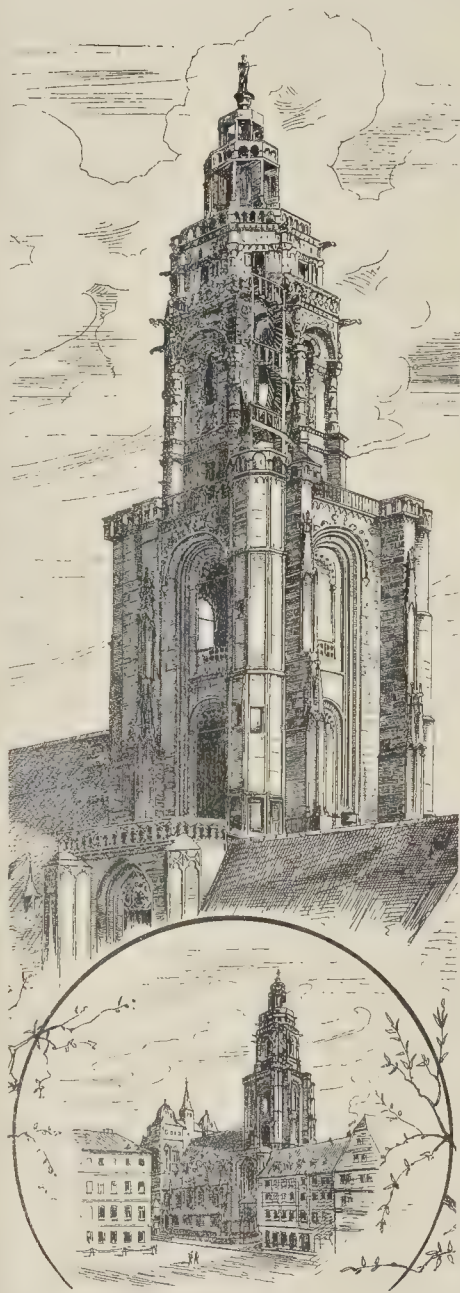








THE KILIANSKIRCHE, HEILBRONN.



CATHEDRAL, FRANKFORT-ON-THE-MAINE.

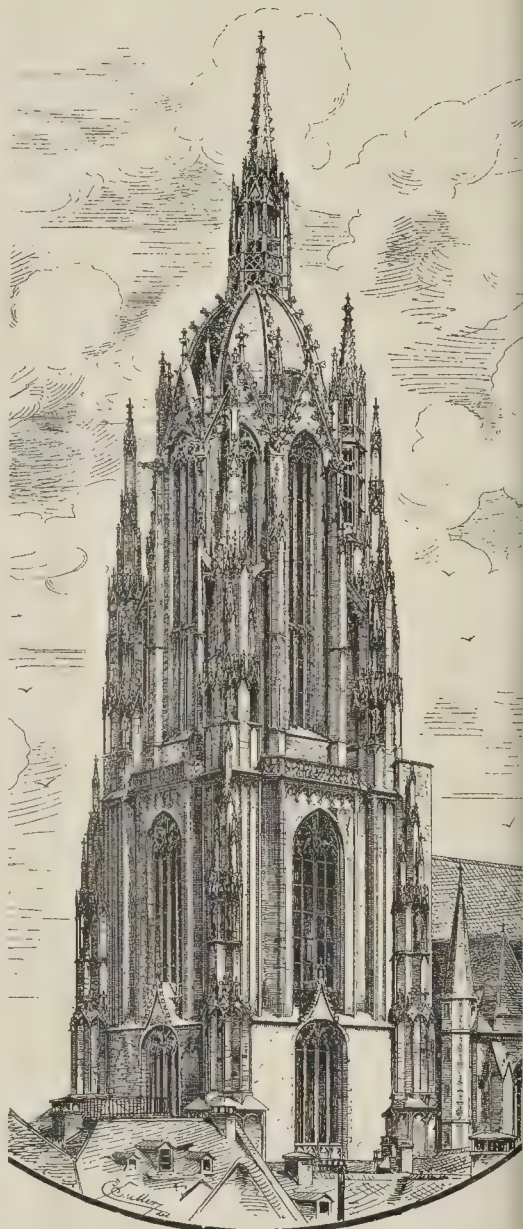
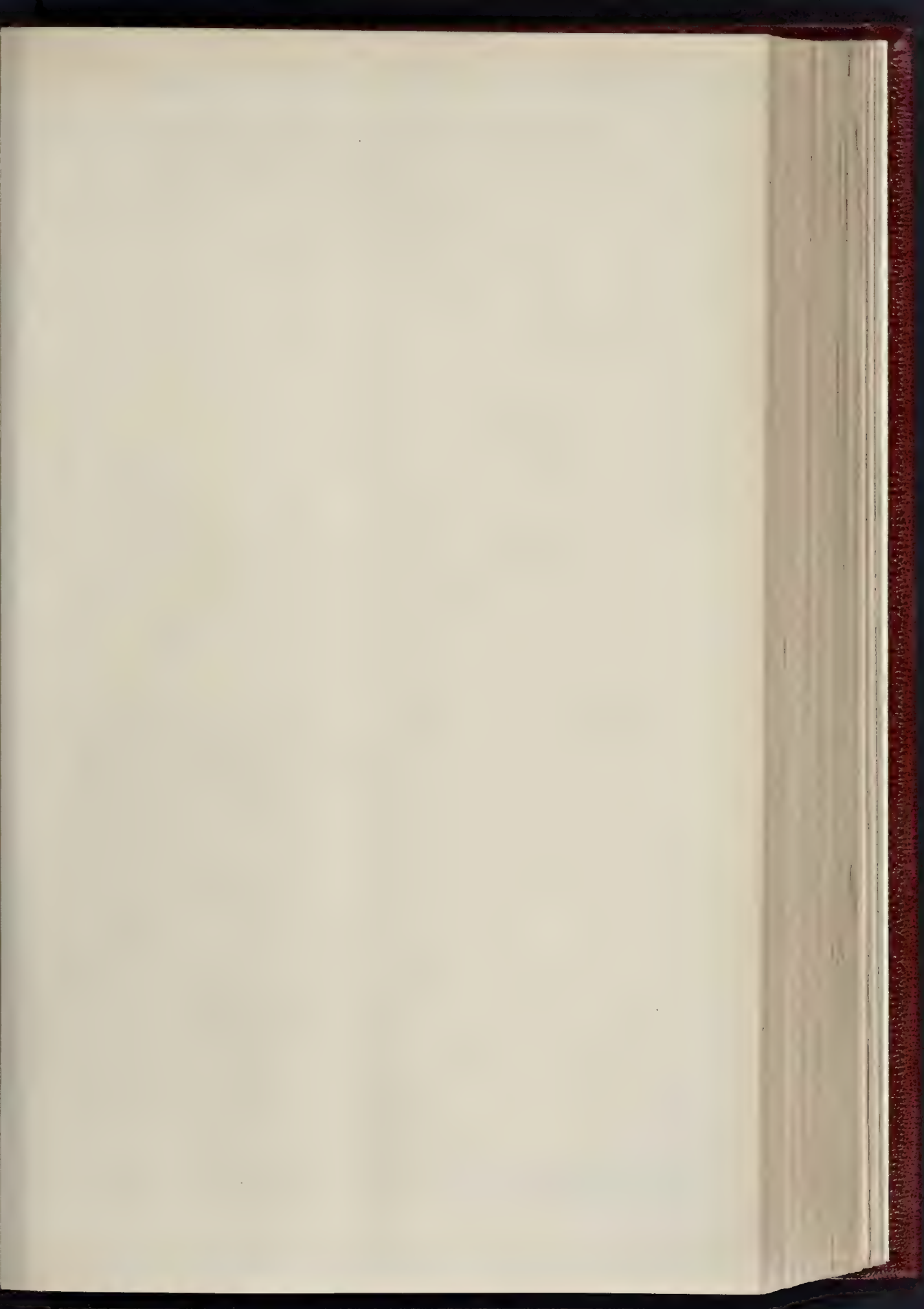


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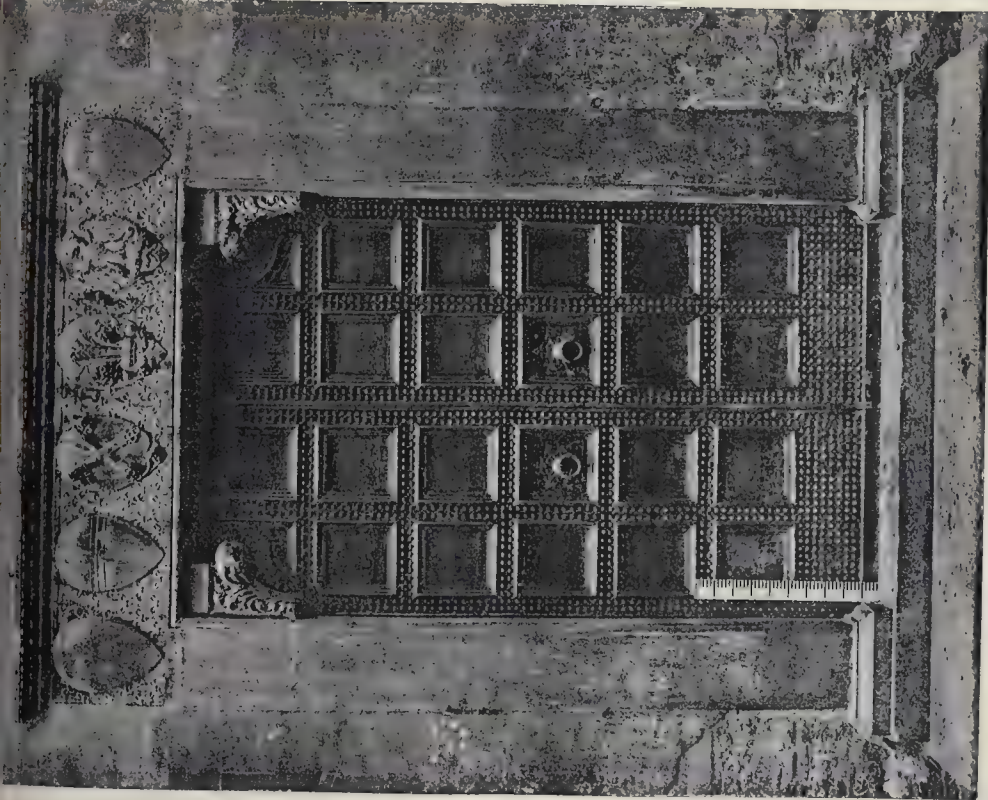




THE BUILDER FEBRUARY 23. 1889







DOOR FROM THE HOUSE OF THE "ARTE DEI RIGATTILIERI"

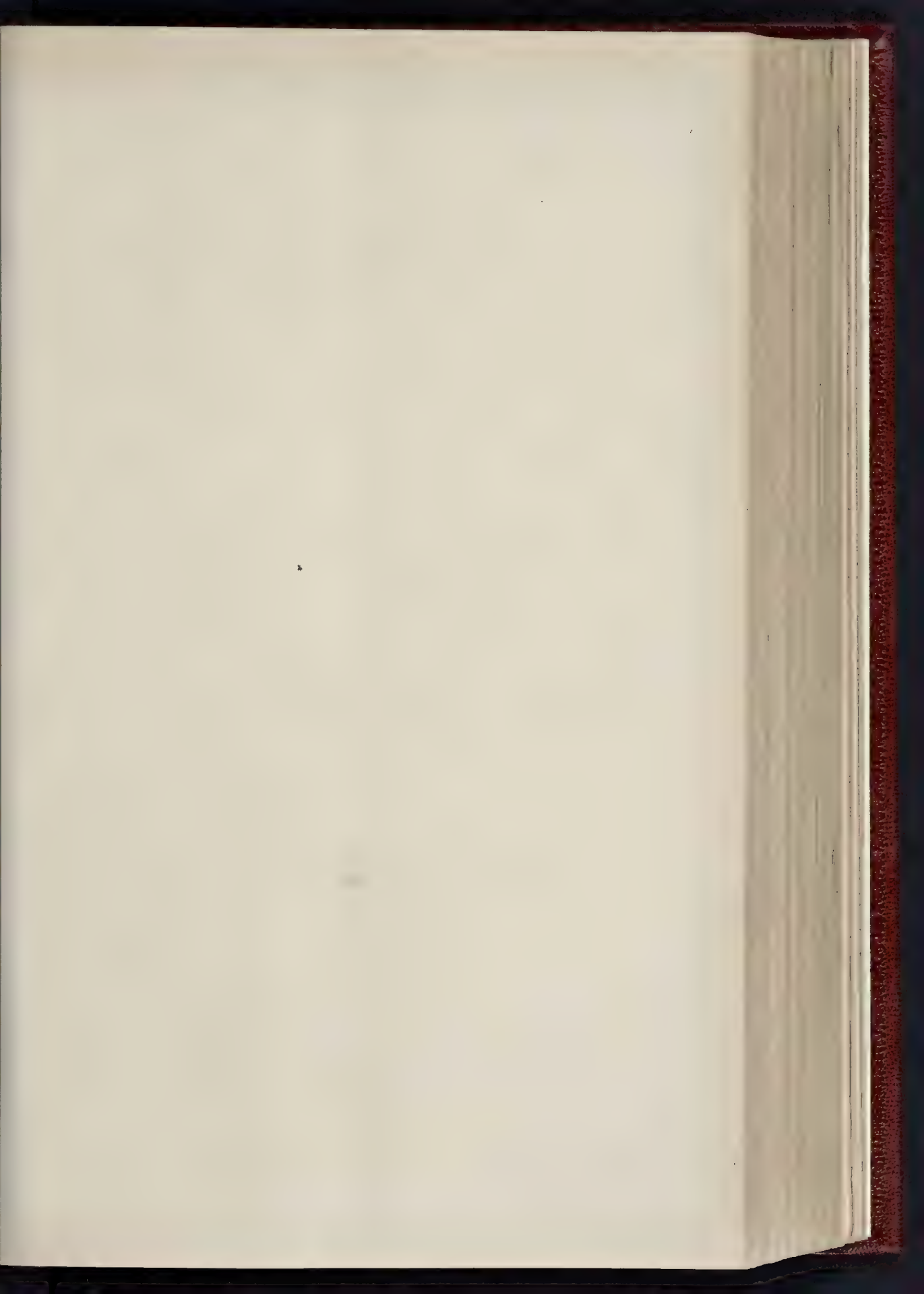
PORTIONS OF OLD FLORENCE, THREATENED WITH DEMOLITION.



LOGGIA DEL PESCE (GIORGIO VASARI, ARCHITECT).



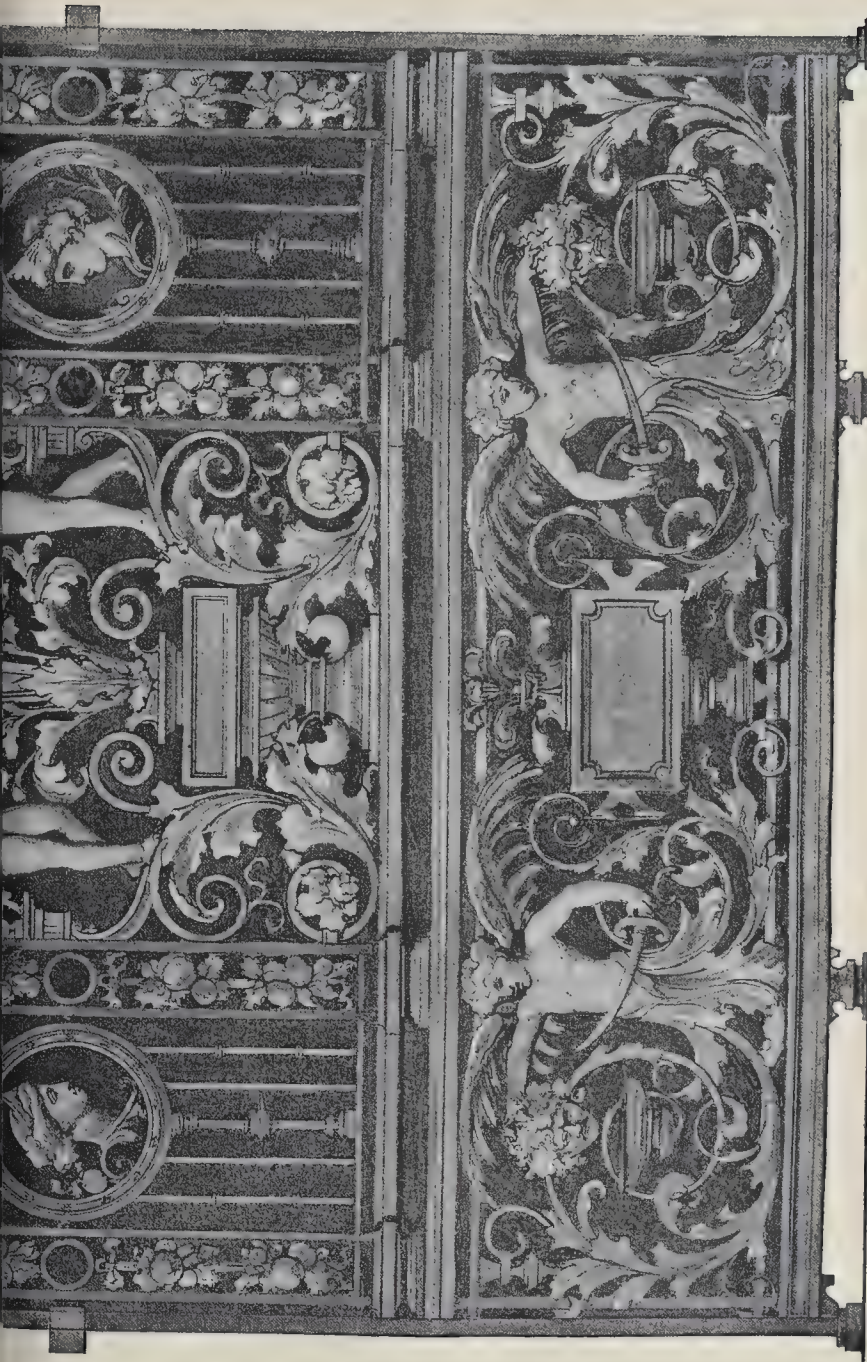




THE BUILDER FEBRUARY 23, 1889.







The Phototype Co., 361, Strand, London.

DESIGN FOR LARGE SCREEN IN WROUGHT AND CHISELLED IRON: SUBJECT, "PEACE."

By Mr. JOHN J. SHAW.



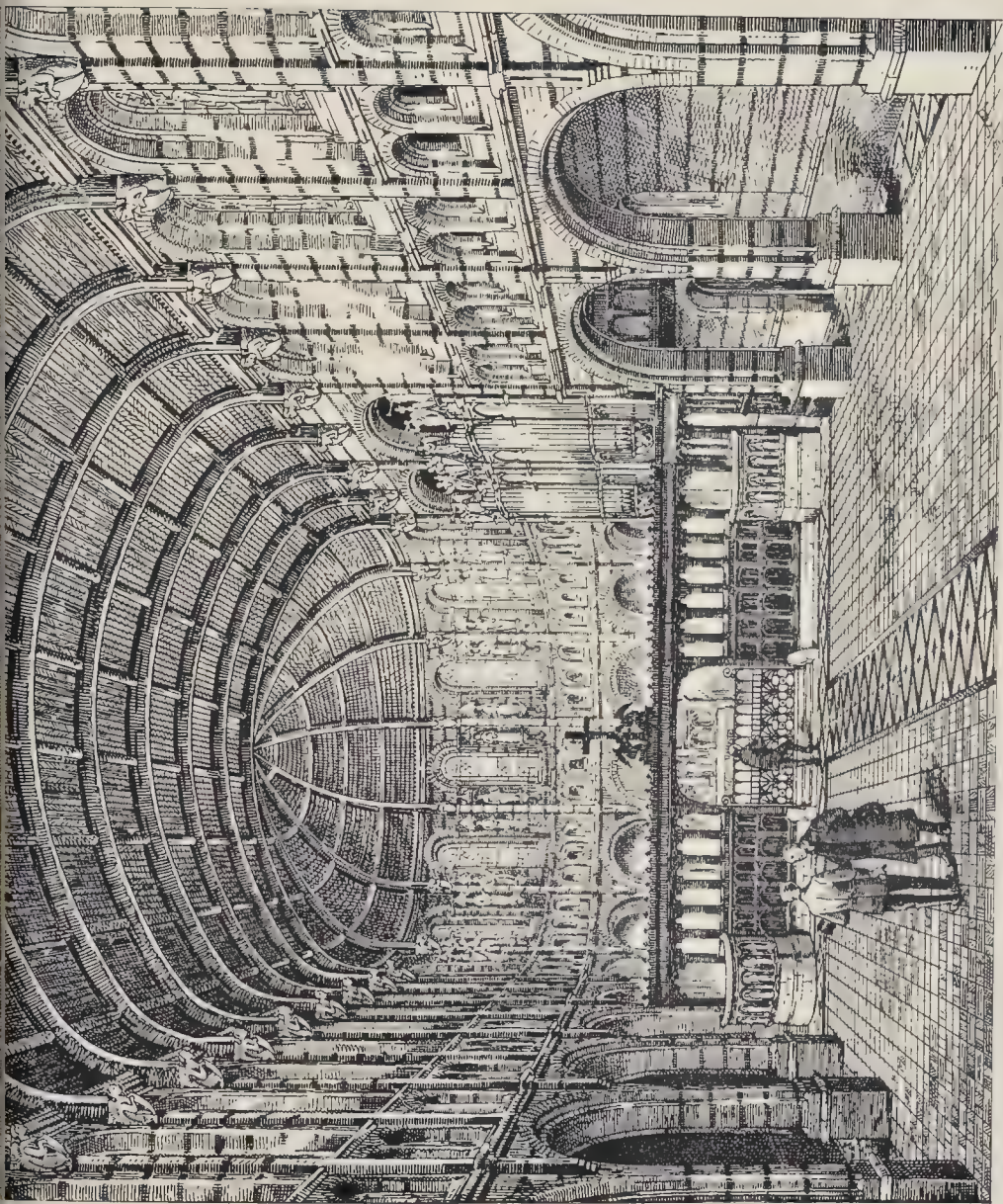




THE CATHEDRAL, MAYENCE. —FROM A DRAWING BY HERR C. SÜTTER.







CHURCH, ROUNDHAY ROAD, LEEDS. — MESSRS. CHORLEY & CONNOR, ARCHITECTS.





## THE ENGLISH RENAISSANCE.\*

In a recent article in the *Builder*, reviewing Muntz's great work on the "History of Renaissance Art," it was observed,—

"The charm and fascination of that extraordinary period in the intellectual history of mankind known as 'The Renaissance' have tempted one student after another to try to get at the heart of its mystery, to learn all about its art and literature, and to endeavour to realise how the men of that time really thought and felt, and what was the origin and meaning of that effervescence of artistic enthusiasm and inventive power which subordinated every other consideration to the one aim of producing beautiful work, whether in painting, sculpture, or decorative art."

Now, without attempting anything in the nature of a history of the English Renaissance this evening, I shall be quite content if I succeed in bringing under your notice a few of its leading characteristics as a style, and a few of the more prominent works of its architects, in the hope that the study may prove of some mutual benefit, and in some measure recompense you for coming here this evening. It seems to me also that the present time is not inopportune for such a purpose, if one may judge from the apparent drift of architectural thought towards a truer appreciation of English art as we find it during the seventeenth and eighteenth centuries.

In England, as elsewhere, the spirit of the Renaissance seems to have been that of a reaction against the asceticism of the Middle Ages,—an awakening, if I may so call it, of the liberty of thought and speech and action from the thralldom of Mediaevalism and all its works,—a glorification of the culture and intellect of humanity as opposed to sacerdotalism of any and of every kind.

The causes that directly led to the results we shall have to consider I can only briefly refer to. Yea, are they not all duly set forth in the book of the Prophet Fergusson, D.C.L. ! And, therefore, as our time is limited, I may just mention in passing those primarily concerned, namely, the revival of Classical literature, the Reformation, the advancement of general education by the development of the printing-press, the more settled state of the Governments of Europe, and the consequently greater facilities for travel. Then, again, local causes influenced the movement with varying force in the different centres of civilisation: in Italy, the birthplace of the Renaissance, and notably in Rome, the existence of the remains of the great works of the Classic ages; in England, the spirit of independence and enterprise which in after-years was destined to raise her to a foremost place among the nations of the world, and which had already in the sixteenth century enabled her to resist successfully all attempts at foreign domination by popes or kings, and laid the foundations of that national freedom which ever since has been her proudest boast.

I have just said that Italy was the birthplace of the Renaissance, and as we may have to consider the influence of her works on the corresponding movement in England, let me in a few words give you an outline of what had been done there previous to the revival in our country. Its immediate impetus was the revival of Classical literature about the middle of the fifteenth century. Fergusson tells us that—

"It was not till the age immediately preceding the fall of Constantinople that the existence of the great literature of Greece became known in Western Europe, but when Petrarch and Boccaccio first became acquainted with its beauties, they naturally lauded their discovery to the skies. Once it became the fashion, and men had got over the unfamiliar names and allusions, it was hailed with all the enthusiasm of a new discovery, and became the literature of the day. Neither in poetry nor in prose, in science nor in literature, had the Dark Ages produced anything that could for one moment stand comparison with the glorious productions of Greek and Roman civilisation."

Again, Gothic in Italy, though it had produced some wonderful works, was always more or less of an exotic; its true home was among the Teutonic races of the north and west. The Renaissance to the Italians was in the main but a return to the traditions of their national art. It is little wonder, then, that the transition from the study of Classic literature to Classic architecture was but short and easy. The hour had come, and, following with the swiftness of cause and effect, came also the men. The cathedral church of Florence, begun at the end of the thirteenth century, had its great octagon still uncovered at the beginning of the fifteenth. Its architect, Arnolfo da Lapo, died leaving

little, if any, information as to what he intended to do with it, so that when Filippo Brunelleschi was commissioned to finish it, he had no original design to guide him. Under the circumstances, and the influence of the dawning Renaissance, he hurried off to Rome and made an earnest study of the famous dome of the Pantheon, that wonderful fane described by Byron as

Simple, austere, sublime.  
Shrine of all saints, and temple of all Gods  
From Jove to Jesus—spared and blest by time.

Returning, he built the Florentine dome as we now see it. This was between 1420 and his death in 1444. During this period also he built the Church of Santo Spirito at Florence, a Classic church on Mediaeval lines, with a small dome at the crossing. Following Brunelleschi came Battista Alberti, with the Church of St. Andrea at Mantua,—a notable example, with coffered wagon vanes over the nave, transept, and choir, springing from pilasters and cornice of the Corinthian order, and with a complete dome at the crossing, carried by four great arches, the type of all the subsequent churches in the style. Alberti died in 1472, and was followed by Bramante, who built the church at Lodi, with a dome in the centre, surrounded by four equal apses, and, besides several palaces, commenced St. Peter's, at Rome, in 1506. St. Peter's, as you know, was carried on by several architects till the great Michelangelo designed the dome, and left it practically completed at his death in 1563.

Besides these typical churches, many great palaces had been built during this famous period, such as the Farnese at Rome, by San Gallo and Michelangelo; the Museum and Palace of the Conservatori, by Michelangelo; the Borghese Palace, by Lunghi, built about the year 1690, and others. Then there come the works of two men who had great influence on the English Renaissance—Vignola and Palladio—contemporaries. They fixed the proportions of the orders by scale, and reduced Classic architecture to the system which has characterised it ever since. One of Vignola's great works was the Palace of Caprarola, designed on the plan of a five-sided fort, 130 ft. each way, with a circular courtyard in the centre, 65 ft. in diameter,—perhaps the germ of Inigo Jones's intended circular court at Whitehall.

Palladio built many famous works in his native city of Vicenza and in Venice, such as the Barbarano Palace, the Chiericati Palace (now the museum and picture-gallery), and the Porti Palace, all in Vicenza; the famous Villa del Capri, which Jones took for his model when designing the Duke of Devonshire's Villa at Chiswick. Palladio also added the arcades to the Basilica at Vicenza, one of his greatest successes. His work was always elegant and well proportioned, and refined in detail,—the work of an artist and a scholar,—and, as we shall find, had probably more influence over the work of Inigo Jones than any other Italian architect. Vignola died in 1573, and Palladio in 1580. With the mention of two other famous names I must bring this brief *résumé* to a close,—they are Sansovino, the architect of the great Cornaro Palace and the well-known Library of St. Mark at Venice; and Scamozzi, who continued the work in 1584, after when Jones visited Venice in 1605. From this hurried sketch, you will observe that the great age of the Italian Renaissance was during the sixteenth century, and that most of its famous works were erected before the movement began in England.

As the sixteenth century was drawing to its close, architecture in this country had been passing through the period of transition known as Elizabethan; indeed, the whole country may be said to have passed through a transition,—a transition from the Mediaeval Tudors to the Renaissance Stuarts. The process was slower and more tentative than in the case of Italy, for the simple reason that the English were more Gothic in their feelings; with them it was a national style, though it may be of a time and a state of society that was fast passing away. Through a period of strife and turmoil, through the crisis of an emancipated Church, through the triumph of a defeated attempt at invasion by a foreign foe, and the consolidation of her national power under a popular sovereign, almost ere the echoes of her guns against the Armada had died away, the spell of Classical literature had done its work. The close of the

sixteenth century saw her ripe for a great change; the hour had come, and, as in Italy, the man came with it in the person of the English Palladio, Inigo Jones.

Inigo Jones was the son of a clothworker, and born in 1572,—the memorable year of the Massacre of St. Bartholomew. He is said to have been apprenticed to a joiner (a good experience for one destined to be an architect), and was probably working at his trade in London when the Armada was defeated in 1588. He was the contemporary of Shakespeare, who was born eight years before him, and died when Jones was forty-four years old; also of Rare Ben Jonson, and of the great Lord Chancellor Bacon. He seems to have devoted himself early to the study of architecture,—so much so, that some noble patrons were induced to send him to Italy in order to perfect himself by a study of the great works of the sixteenth century. In the beginning of 1603, Queen Elizabeth died, and was succeeded by the British Solomon, James I., afterwards one of Jones's most appreciative patrons. Shortly after the famous Gunpowder Plot, Jones paid his first visit to Italy. The brief outline I have given of the rise of the Italian Renaissance will serve to recall to your minds what he found there, and we shall presently discover to what good use he put his knowledge. In Italy he seems to have met Christian IV., King of Denmark, who invited him to Copenhagen as his architect. There he met the King's sister, wife of James I., and returned with her to England. He was appointed by James Surveyor-General of Works, and seems to have been specially employed by his eldest son, Henry, Prince of Wales. On the death of Prince Henry, in November, 1612, Jones returned to Italy, and once more devoted himself to the study of the works of the great masters. Between these two visits he probably designed and carried out the Quad at St. John's College.

On his return from this second visit to Italy he designed the new Whitehall Palace. Probably the scheme may have been talked over before he went abroad, and, if so, it is more than likely this second visit had something to do with it. Be that as it may, Jones was now in the prime of life, and a thorough master of the principles as well as the practice of his art. His design for Whitehall is so well known that I need do no more than give a general reference to it. It was proposed to occupy a site extending from St. James's Park to the river, 1,152 ft. in length by a breadth of 874 ft.,—from about the present Horse Guards to Westminster. Through the centre of this vast area ran the great court of the Palace, occupying nearly the site of the present roadway of Whitehall. On each side of this great central court were three smaller courts, the centre one on the park side being circular, 210 ft. in diameter. The only fragment of this great scheme ever carried out is the Banqueting-house, now standing on the east side of Whitehall. Jones could have seen nothing on so vast a scale in Italy, or, indeed, anything at all like it. It shows what a consummate artist he must have been, and how thoroughly he was imbued with the spirit of the Renaissance he had studied so diligently,—that he was able not only to produce such a magnificent design, but to invest it with an originality of treatment and character all his own, and lay the foundation thus early of that peculiarly English phase of the style which it never afterwards lost. It bursts upon us in all its maturity, stamped with the individualism of its nationality, the first-fruits of the English as distinct from, and in some respects superior to, even the Italian Renaissance,—the labour of no mere copyist or adapter, but the work of an accomplished artist and an original thinker. It will be seen from the Banqueting-house, which was built between the years 1619 and 1621, that he was happier in the sources of his inspiration than the hands available to carry out his designs. Though the details are, like all his work, admirably drawn, at times the execution, and notably in the carving, falls below his ideals. The workman had not yet been educated to that perfection of workmanship to be found under Wren and Grinling Gibbons; but in spite of this, and that it is but a fragment, it remains one of the most impressive works of the style in England. Speaking of the Whitehall Palace as a whole, Mr. Fergusson says "that it was not so much in dimensions as in beauty of design that this proposal surpassed other European palaces. The only building to compare with its internal courts is that of the Louvre, but that is less in height and dimen-

\* By Mr. J. M. Brydon, F.R.I.B.A., being a Paper read by him before the Architectural Association on the 14th inst., as elsewhere mentioned.



sions, and has not the simple grandeur which characterises this design; it wants, too, the variety which is produced by the different heights of the parts, and the richness of effect produced by the change of the design in the various blocks. Externally Whitehall would have surpassed the Louvre, Versailles, and all other palaces by the happy manner in which the angles are accentuated, by the boldness of the centre masses in each façade, and by the play of light and shade, and the variety of sky-line which is obtained without ever interfering with the simplicity of the design or the harmony of the whole." In 1620 Inigo Jones was appointed Commissioner for the repair of old St. Paul's. He proceeded to remodel the west front in the Classical style, but nothing was done till 1633.

In the interval his patron, King James, had died, in 1625, and was succeeded by his son, Charles I. Jones, like Solomon of old, was a great builder, or would have been had he only had enough money. The projected Palace of Whitehall was quite in accordance with his character. He was generous to profusion, he had a great notion of kingly dignity, but was not always so fortunate in keeping it up. In his later years, what with the failure of the Spanish marriage project for his son Charles, which is said to have lost him two millions, and wars of one kind and another, his exchequer became sadly reduced. Charles had not been long on the throne when the struggle began between him and Parliament which ended only with his life. Money was one of the main causes of dispute, so that, under the many adverse circumstances, it is hardly to be wondered that the Commissioner for the repair of St. Paul's found himself unable to make any substantial progress till something like thirteen years after his appointment. In 1633, however, as I have said, the work was actually begun. That great High Churchman, Laud, then Bishop of London, laid the first stone. Probably he was the prime mover in urging on the so-called repairs. This was the beginning of the famous west portico, which was destroyed in the Great Fire. It was a magnificent structure, 200 ft. long, 50 ft. deep, and 47 ft. high,—dimensions worthy of the Romans. It was of the Corinthian order, had eight columns and two square pillars of extremely good proportion and detail in front, and three columns in the depth. As it had a flat roof, there was no need for a pediment, so it finished with a simple balustrade,—a stately and dignified composition. Of course, it had no sympathy whatever with the old Gothic cathedral, and I am bound to say that with the exception of the portico, Jones's west front was a very poor, weak-minded affair indeed. But all the same, I don't suppose the anomaly troubled the heads of the Dean and Chapter, or their architect either. It is interesting to note that the well-known church on the Grand Canal at Venice, Santa Maria della Salute, is contemporary with Jones's work at St. Paul's, having been begun in 1632. The difference in character and feeling between these works is very striking and very instructive. It shows how distinct were the phases of the Italian and English Renaissance even at this early period,—a distinction to become more and more marked as time went on. It would be an interesting speculation, had we time to enter on it, to consider, had this famous portico been preserved from the fire, what its influence would have been on Wren's design for the new cathedral. It would have given the key-note to the order to be employed, and necessarily have dominated the scale of the exterior. I wonder also what Jones would have made of an entirely new cathedral, had it been his fate instead of Wren's to re-build St. Paul's!

I may just mention, before leaving the subject, that the front of old St. Paul's extended much further west than the present building, and that the site of this portico would be somewhere about the place where the statue of Queen Anne now stands.

Jones seems,—as far as the permanency of his work goes,—to have been equally unfortunate in another commission he had at this time, namely, the garden front he designed for old Somerset House. It was taken down when Sir Wm. Chambers began the present building,—the Strand front of which is said to be more or less a copy of it.

Jones's hands seem about this time to have been full of work. In London he designed Covent Garden Church (St. Paul's) and the Market-square, the well-known Water-gate to old York House, Ashburnham House, with its

beautiful staircase,\* one of the most charming interiors in England. He laid out the square of Lincoln's-inn-fields, and built some houses on the west side of it, which are still standing. He built also the Queen's House at Greenwich, and the Duke of Devonshire's Villa at Chiswick. The design of the latter is founded on Palladio's Villa del Capra, about a mile from Vicenza, but treated with a character and originality all its own,—another marked example of the distinctness of the English from the Italian phase of the style, to my thinking altogether in favour of the former. This villa has since been enlarged, but not improved, artistically speaking. In the country, among other mansions, he designed Coleshill, in Berkshire, and Wilton House, in Wiltshire, both notable examples of his taste and skill. Nothing could be happier than his treatment of these and other similar façades. He discarded the everlasting orders, and designed his details with a vigour and freedom from the so-called trappings of Classic which we would do well to profit by. His whole handling of the style is characterised by a picturesqueness and a nobility rarely equalled by his successors, and quite refreshing after the monotony of latter-day ebullitions. He was a master of proportion, and none knew better than he did the value of fenestration, the balancing of voids and solids, and the grouping of masses generally. Internally, his rooms showed his genius for proportion and his powers as an artist even more than his exteriors; combining apartments of all sizes, as every one has to do in an English house, he always managed to make each gain rather than lose by contrast with its surroundings. He got over the difficulty of heights by coives and coffered ceilings, sometimes even making the dove of a room a third of its total height, and leaving it perfect in proportion, a panelled wall and ceiling, with the skill and touch of a true artist; while corridors, halls, and staircases came from his hand as things of beauty and a joy for ever. Witness the little staircase in Ashburnham House, than which nothing more refined, more stately, and yet more like an English gentleman's house has ever been designed. In a word, he not only founded the English Renaissance, but created its national character, leaving it to us as a precious heritage, to keep and to guard, and, above all things, to study and maintain, that we, through his labour being rich, may bring forth fruits worthy of the high ideal he has set so nobly before us, and never let anything pass from our hands to which, could he but see it, he would blush to put his name.

The troubles which had probably delayed his work at St. Paul's thickened round his king as the years advanced. It is not my province to touch on that struggle, which, amid Parliaments and plots, courts and camps, petitions of rights and impeachments of bishops, storm of battle and the intrigues of traitors, moved slowly but surely to the inevitable end. Jones was a Catholic and a Royalist; for this he was compelled to share the misfortunes of his sovereign. At last, on a fatal winter morning, when the snows of seventy-seven winters had passed over us, he died, there came forth from the central window of the Banqueting-house he had designed in the enthusiasm of his return from sunny Italy, never thinking to what sad destiny it was foredoomed, a little procession to the banquet of death; and, in a few minutes, the passing of Charles Stuart from, as he said, "a corruptible to an incorruptible crown," invested the Palace of Whitehall with an historic interest its architect could never have dreamt of. Jones himself did not long survive the master to whose pleasures, in his happier days, the genius of the artist had so often lent additional attractions; for at Somerset House, at the good old age of eighty years, this wonderful designer of pageants and palaces, of masques and markets, of temples and villas, this bright morning star of the English Renaissance, entered into the rest he had so nobly earned.

During the years of the Commonwealth, architecture may be said to have been simply a blank, though Carter and Webb, pupils of Jones, carried on the tradition in a tentative fashion. Webb was Jones's nephew, and married his only daughter. He seems also to have been heir to his practice, as we find him carrying out Amesbury House, in Wiltshire, and the east side of the court of Greenwich Hospital, both

of which are said to have been from Jones's designs, but this is more than doubtful.

If things architectural were in a defunct state during the Protectorate, it was not long after the Restoration till they were woke up in tremendous fashion by the Great Fire in 1666! Something like 400 streets, 13,000 houses, numerous churches, and old St. Paul's Cathedral, were reduced to ashes in three days and nights. Most of the houses were built of wood; it was a dry season, a strong east wind was blowing at the time, with the result that by the time the fire was subdued London of the Middle Ages had practically ceased to exist. The English Renaissance had indeed received its baptism of fire, and its second greatest architect the most splendid opportunity that fortune could bestow.

Sir Christopher Wren,—a gentleman by birth, a scholar by education, and an architect and astronomer by profession,—had already designed the Sheldonian Theatre,—a most successful work,—at Oxford, and had been engaged in various projects for the restoration of old St. Paul's, when the Fire settled the question for good and all. Wren had gone abroad to study, and was in Paris at the time. From there he hurried home to take his place as the foremost architect of his time and one of the greatest figures in the history of English Art. With the grasp of a statesman and the skill of an engineer, his first work was a plan for the rebuilding of the city; to our everlasting regret it was never carried out. Recent so-called improvements, viewed in the light of this masterly arrangement of streets and squares, sink into insignificance. London missed the golden opportunity of becoming one of the handiwork and most convenient cities in the world, and Wren received his first disappointment. But if he was not permitted to lay out its streets, he could at least do something for the buildings that should adorn them, and for his many monuments we have but to look around us. From this time onward till the close of the century, the number and importance of the works which he designed and carried out is simply amazing. In London, in Oxford, in Cambridge, in Eton, in Hampton Court, in Greenwich, in town and in country, he seems to have been almost ubiquitous, he went everywhere, he did everything. In capacity for work and facility of accomplishment, he was an English Michelangelo. Like his great prototype, his life was as long as it was busy. At thirty years of age we find him on a Commission for the repair of old St. Paul's; forty-eight years afterwards the last stone of the lantern over the dome of the new cathedral was laid by his son in his presence. Time would fail me to attempt even a brief résumé of the many works which he went on to make up his marvellous record. If not at all times a mighty artist, such as Jones, his constructive powers were equalled only by the fertility of his invention; and it will never cease to be a matter for congratulation that a man of his genius should have been available at such a crisis in the history of our profession.\*

#### FREE LECTURES TO ARTISANS AT CARPENTERS' HALL: PROFESSOR KENNEDY ON "THE STRENGTH OF IRON AND STEEL."

The second of the present series of free lectures on subjects connected with building, under the auspices of the Carpenters' Company, was delivered on Wednesday, the 3rd inst., by Professor A. B. W. Kennedy, F.R.S., M.Inst.C.E., the subject being "The Strength of Iron and Steel." Mr. H. C. Saunders, Q.C., presided, and there was a large attendance, notwithstanding the inclemency of the weather.

Professor Kennedy said the subject presented, among other difficulties, the primary one that it was so tremendously large. First of all, in speaking of the strength of iron and steel, one naturally thought of its tensional resistance. There were many other points of view, however, which were quite as important, but all he could do was to point out some of the more striking and important of these. Roughly, what did one mean in the first instance by speaking of the strength of a piece of iron? Apart from the questions of the effect of time and vibration, they might say its strength

\* To be continued.

+ The first lecture of this course, by Professor Roger Smith, on "Chapters from the History of Carpentry and Joinery," has been printed in *extenso* in the *Builder*. (See pp. 109, 127, *cont.*)

\* See *Builder* for Jan. 14, 1882, for a drawing by Mr. H. W. Brewer of the staircase; and for March 14, 1885, for details of the same, and plans of the house, from drawings by Mr. Harry Sivier.



was measured by its resistance to being visibly distorted or deformed, which was practically what was commonly called its elastic strength; or they might mean its resistance to being broken, which was usually termed its ultimate or breaking strength. In order to show what happened to a piece of iron or steel when it was strained by simple tension, he asked the audience to exercise their imaginations, and to suppose that he had a bar of cast iron, 1 in. square and 40 ft. long, suspended from the roof. A piece of cast iron became  $\frac{1}{1000}$  part of its length longer for every ton per square inch of weight put upon it. If he put two tons on it, the bar would come down about the sixth of an inch, and when he got to four tons, it would lengthen about double as much. When he got six tons, it would be extended about half an inch, and if he went on loading it he would get more and more extension at a somewhat more rapid rate. At twelve tons, when it had become perhaps an inch longer, he should expect it to break, even if it were first-rate metal. He should have got an entirely different result if he had taken a piece of wrought iron. Below its elastic strength a piece of wrought iron extended just about half as much as a piece of cast iron, so that a piece of wrought iron, 40 ft. long, would extend  $\frac{1}{2000}$  part of its own length for every ton per square inch. The iron would not break when it got to 12 tons. At 16 tons it might stretch 5 in., at 18 tons 7 in. or 8 in., and before the bar broke he might have got it extended to 42 ft., instead of 40 ft. That was a case where they had the ultimate strength a great deal more than the elastic strength, and although the wrought iron did not extend so much as the cast iron to begin with, it had left the cast iron hopelessly behind. If instead of having wrought iron he had had soft or mild steel, he should have had just the same thing, only on a more extended scale. A piece of good wrought-iron plate would extend perhaps 12 per cent. of its length before it broke. A piece of good soft steel would extend 20 to 25 per cent. of its length before breaking, always supposing that its length was about 10 in. He did not suppose that a bar of 40 ft. would extend to 44 ft., because it was perfectly certain there would be a flaw somewhere, which would cause its extension not to be so great. The strength of that 40 ft. long wrought-iron bar depended practically only on its area. If they halved its length it would be just as strong, so that its strength was independent of its length and independent of everything except its area. Where the material was to be compressed or crushed instead of torn asunder they came to a dreadful set of complications. Supposing they took a 40 ft. bar and loaded it at the top end, in all probability it would begin to take a big bend, and would snap, not by being crushed, but by buckling and by want of resistance to tension on the convex side. The strength of a strut did not depend upon its area or its length alone, but upon its shape and the way the ends were held as well. In what was called resistance to shear they had quite another sort of thing altogether. The resistance to shear was about four-fifths of the resistance to tension. These were three simple cases of finding the strength of materials by testing-machines, but one wanted to know how these results were to be interpreted in view of the uses to which they actually put iron and steel. Would a piece of iron that had a certain tenacity have that same resistance to tension if it were left alone for fifty years, or would it deteriorate or improve? In the case of cement, the strength increased very much with time. Nobody had any notion that iron got stronger, but there was a question whether it did not get weaker. He had sent him some little time ago for testing some pieces cut out of the suspension rods of the Conway Suspension Bridge, which was, if not the oldest, at least one of the oldest, suspension bridges in the country. He tested the iron, and found that it was as good as when put in. In the making of iron it was perhaps not possible to obliterate entirely the separation between the various pieces, although in very good iron it was nearly obliterated. During the fifty or sixty years of the existence of the bridge, the weather had found out the separations, and here and there he discovered little golden specks right in the heart of the metal, where damp had slowly got in and had begun to deteriorate the iron. The time had not been sufficient for any real harm to be done, but there were little golden discolourations in places where it had not been well painted outside,

which showed clearly what might have happened. The iron itself, however, did not seem to be injured; and if, instead of iron, they had used the more homogeneous material steel, he did not think any damp could have penetrated. The evidence, therefore, was very strong, that iron did not deteriorate with age in any way whatever. A very much more vexed question, and one of much more practical importance, was, did iron deteriorate in consequence of the vibrations to which it was subjected? If it did, it was a very serious matter for all our structures, because there were very few things that were not subject to vibrations of some kind. Not long ago, an engineer in Scotland, being interested in this matter, put a little instrument, whose function it was to record earthquake vibrations, on the middle of the Tay Bridge. It consisted of a couple of very delicately-balanced pendulums, which drew little curves upon a table directly they were shaken. The result of the experiment was that when a train came on to the bridge half a mile from where the instrument was it began to move. The vibrations at first were very minute, but they got bigger and bigger until the train went past, and they continued until the train left the bridge on the other side. The same thing happened in the case of every railway-bridge each time a train passed over. There was a very deeply-seated popular belief that this vibration made the metal crystalline. He had, like many other engineers, been much interested in this matter, and a few years ago he got some of our principal locomotive superintendents and civil engineers who had possession of old, discarded axles, pieces of bridge angles and plates, and old pieces of rails, to send samples for testing. In no one instance did he find any alteration whatever that he could ascribe to this vibration. The only evidence one got was a railway accident now and then by a broken axle; but from that one must not say that the iron had become crystalline because of vibration. The appearance of a fracture merely depended upon the way in which it occurred. A fracture in an axle might often happen somewhat in this fashion: there was a flaw in the metal somewhere, and the load that came on it with the continually-repeated pushing, or pulling, or bending, strained that particular place beyond its elastic strength. That strain became gradually worse until the crack had extended considerably, and the last extension might occur 100 times as fast as all the rest. The axle eventually broke where the crack was, or at some place fixed by the position of that crack. It was pretty certain that it would break suddenly, and in that case they would get a hard-looking crystalline fracture, although the metal itself had not undergone any such change; so, at the risk of saying what was contrary to the opinions of a good many, until some evidence was adduced to show that the constitution of ordinary metal was altered by continual vibration, he could say nothing, except that he believed that no such change took place. A great many pieces of machinery, such as the piston-rod of an engine, were subjected to an enormous number of repetitions of load. He asked if the mere fact that the iron was exposed to such frequent repetitions of load,—of tension, or compression, or of both,—tended to make it break sooner than it would otherwise do? Having referred to the experiments of Fairbairn, and of the German engineer Wöhler, he said the result of these was, on the whole, encouraging. Although repetition of load would cause fracture under some circumstances, it would not cause it under others, and it was mainly a question of using their common-sense to see where they could draw the line. He thought they might say they could draw the line at the elastic strength. Any load that exceeded the elastic strength would break the material if it were applied often enough. So far as he knew, no load that was under the elastic strength would break the material, however frequently applied. He was speaking now essentially of tension. If he had to speak of alternate pulling and pushing he should have to go into more details than he had time for. No engineer, or anybody who had anything to do with construction, would ever intentionally strain any part of his material up to the elastic limit, therefore they might safely say that so long as a girder, or tie-rod, or piston-rod was not strained up to its elastic limit they might go on pulling or pushing as long as they liked, and no number of repetitions would injure it. But it was all very well for some one to say in an office that a certain

piece of iron would not be strained beyond its elastic limit. One of our most distinguished engineers in this country—Mr. Benjamin Baker, who designed the Forth Bridge—had said to him several times that he did not believe there was a bridge in existence in which some portion might not be locally, by some accident, strained beyond its elastic limit. If there were only one or two places in a very big bridge, it was possible they would be so isolated that they would have no detrimental effect, but still they might have, and they might exist just in places where the repetition of load might find them out. But the saving clause of all that was that if the material was ductile it could not well give way in the sense of breaking without so much distortion taking place first that the injury would be found out before it became serious; at any rate, they must hope so. In the case of cast iron, a great deal of which was used in our structures, there came in a very serious difficulty. When they got a big casting delivered, apparently solid and perfectly straight, they did not know what stresses there were in the material already. They did not know how its molecules were pulling and pushing among themselves. He was asked to go the other day to see some stanchions weighing five or six tons, which had given a great amount of trouble. They had been delivered perfectly good, and on the very same night the watchman in charge was startled by a very loud explosion. One of those huge stanchions had broken in three pieces. He did not think, however, there was blame attaching to anybody there. The metal broke in consequence of the existence of what might be called "latent" stresses, due probably, mainly or altogether, to unequal cooling. It would be a great discovery when some one found out how to ascertain when there were such stresses in a casting. Until they knew that, they could not tell what the strength of a casting was.

#### THE ARCHITECTURAL ASSOCIATION.

THE ninth ordinary meeting of the present session of this Association was held on the 15th inst., in the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

The following new members were elected, viz., Messrs. J. Harrison, F. G. Hicks, C. Harrison, G. Drew, and F. G. Hayward.

A vote of thanks was passed to Mr. Leonard Stokes for allowing the members to visit the new houses at Palace-court; and also to Messrs. Daw, Jowett, & Co., for permitting them to inspect their flats at the same place. The next visit, it was stated, would be on Saturday, the 23rd inst., to buildings in Charing Cross-road and Shaftesbury-avenue.

The Chairman announced the gift to the library of a very interesting series of photographs taken by Mr. J. J. Cole, the architect of the Stock Exchange, and consisting chiefly of City churches taken from points of view not now accessible.

Mr. T. E. Pryce (Hon. Sec.) then read the by-laws for the affiliation of the Birmingham Association.

Mr. W. H. J. Leverton, after the by-laws had been formally moved and seconded, complained that sufficient publicity had not been given to them, and, as a protest, moved—"That the discussion of the by-laws be adjourned to this day month, and that the principal items be printed, and sent to every member."

Mr. A. O. Collard seconded the amendment, which, however, on being put to the meeting, after a good deal of discussion, was lost, and the by-laws were passed by a large majority.

Mr. J. M. Brydon next read a paper entitled, "The English Classic Revival of the Seventeenth and Eighteenth Centuries." The first half of this we print on another page.

Mr. H. L. Florence, in opening the discussion, said he was somewhat disturbed in his mind at hearing a conversation in that room before the meeting began between two of the younger members, who were looking at the drawings. One said, "It will never do to revive this style of Classic architecture now!" To which remark the other replied, "No, it would give too much trouble!" (laughter). Those gentlemen were doubtless philosophers, but they correctly represented the prevailing feeling of the age. Those who had listened to Mr. Brydon's paper, and had given their attention to the illustrations of harmony of proportion, refinement and suitability of detail, and clever combination of plan,



as in St. Stephen's, Walbrook, would understand that to arrive at any success in that style would entail a greater amount of trouble than merely following haphazard the lines of some leading architect of the day. If they inspected the drawings on the screen they would see that some sort of system and some general idea ran through them all. They were not mere repetitions of Classic or Italian work, but contained considerable national feeling. For instance, instead of the lofty proportions of the French type of window, in the English Renaissance the windows, doors, mantelpieces, &c., were of a squarer form, and the same idea was carried out in the development of the Classic afterwards. Again, the examples showed a greater breadth in proportion to their height, which gave them, to some extent, a reflex of the national character, and a certain comfortable amount of substantiality (applause).

Mr. J. J. Stevenson seconded the vote of thanks, and said he considered they were indebted to Mr. Brydon for bringing together such a remarkable collection of drawings. Whether they approved of the style or not, they must all be delighted at the opportunity of seeing so many illustrations of what were considered to be its greatest examples.

Mr. Joseph Pennell, some of whose charming sketches of the old City Halls were exposed on the screen, said that in London were to be found some of the most beautiful buildings in the world. In fact, he had no idea that such an amount of wonderful material for sketching was to be found in the Metropolis. He had made those sketches for the *Century* magazine, and went on until he got tired of the wealth of material that presented itself.

Mr. J. Douglass Mathews said that doubtless many of them had studied with interest Wren's many spires and steeples, which all differed in treatment. They had all heard of the enormous number of works attributed to Wren, but it was perfectly certain he was not to be held responsible for them all. He should be glad if Mr. Brydon could inform them who was associated with Wren in many of his works. He believed that the City Architect of the day, Jarman, was in some way concerned, as a difference in the work was to be traced. One of the smaller halls of the City,—that of the Innholders' Company,—came under his care a short time ago, and although it was attributed to Wren, and no doubt he had something to do with it, he (the speaker) was astonished at the exceedingly unscientific work, especially in the construction of the roof of the building. There were also a great many houses and other buildings erected about the same time, commonly ascribed to Wren, with which he believed that great architect had nothing to do, but which bore marks of a master hand. Wren's pupils, Hawksmoor, Vanbrugh, and others, did a good deal of work, and possibly some of it might be put down to the master. It was a pity Mr. Brydon had been compelled to leave off at the point he did, as plenty of matter had been left for another lecture. If, therefore, Mr. Brydon would be good enough to turn his attention to the works of Dance, Kent, Taylor, Soane, and others, the profession and the public would be grateful (applause).

Mr. Henry Lovegrove remarked that he recollected when the style dealt with that evening was looked upon as something very dreadful, and considered as a bastard type. They now saw a remarkable change of opinion, several of the most eminent architects of the day studying and designing their buildings on the line of the old Classic works. No one could wonder at the so-called "Queen Anne" style coming in vogue for domestic buildings, for which Gothic never was a successful style in this country.

Mr. H. W. Pratt referred to the melancholy spectacle of the stones of Burlington House colonnade lying in Battersea Park, and suggested that they should be utilised to form a handsome approach to the new palace which, no doubt, would be built, for the London County Council (laughter).

Mr. Leverton said he understood that the dome of the Radcliffe Library at Oxford was said to be the third largest in England, St. Paul's being the first. He would like to know which was the second? Mr. Brydon had condemned the two orders in the west-front of St. Paul's, but did he not consider that if there had only been one order used it would have been too coarse and gigantic? A good deal of the interesting work contained in the City Halls was not easily accessible, and it would be well

if the Committee of the Association arranged a series of visits to those buildings (applause). Referring to the Church of St. Mary-le-Bow, Cheapside, he believed there was some Norman work to be seen in the crypt.

Mr. A. C. Bulmer Dooth said that the first church erected by Wren, after the great fire, was that of St. Nicholas Cole Abbey, in 1666, the neighbouring church of St. Mary Magdalen being finished in 1668.

Mr. Alexander Payne expressed the great pleasure with which he had listened to a paper on perhaps the most beautiful period of English architecture, described by so enthusiastic and able a lecturer. A few years ago he went to measure the stones of the Burlington House colonnade, at Battersea Park, when he found small boys with hobbled boots running over and jumping upon them.

Mr. F. B. Farrow (Hon. Sec.) said that about seven years ago a scheme was set on foot by the vicar of Battersea for re-erecting the Burlington House colonnade in Battersea Park. He was then employed to measure the stones, and he found they were all there, as well as the wooden doors which led into the arcade (applause).

The President, in closing the discussion, stated that the stones of the colonnade had passed, with Battersea Park, into the custody of the Metropolitan Board of Works, and a few months ago that Board was in correspondence with the Office of Works as to who was to be at the expense of carting away the stones as rubbish! Mr. Brydon, in his paper, had omitted the name of John Thorpe and the Smithsons. Another carver who had a great influence on the early Renaissance was John Chapman, who carved many mantelpieces. Some of his best work was to be seen at Lacock Abbey, though it had not been measured yet, but the owner would be happy to afford every facility for that being done. Suggestions had several times been made as to having a series of Saturday visits to the Renaissance work in London, and perhaps the Hon. Secretaries would take the subject into their consideration. He understood, with regard to Sir Christopher Wren, that he was the first architect who supplied full-sized working drawings. The vote of thanks was then put, and carried by acclamation.

Mr. Brydon, in replying, said he was under much obligation to the gentlemen who had lent him the unique collection of drawings he was able to exhibit, and notably Mr. Pennell and Mr. Troup. Kirby Hall, he believed, was Thorpe's work, but the first stone being laid in 1570, it was a little before the time with which he had been dealing. He did not believe that Wren drew out all the details of his many works. In the case of the Cambridge Library, Wren wrote that he presumed they had good masons there, because, if not, he would be happy to supply the details "at large" (i.e., full size). No doubt much of the work, and especially in the country, was done by the workmen, both the carpenter work and the full-sized details, showing that the workmen of the time were thoroughly imbued with the spirit of the work, and that they stamped the English character upon it. That seemed to him to be much better than education in schools like South Kensington, and to be the true way of making the art-workman. As the subject was such a vast one, he had been unable to mention all the names, and was obliged to confine himself to the leaders of the movement. As to Dance, the Mansion House, designed by him, was an extremely interesting piece of work. The ballroom there was a beautiful chamber, panelled entirely in wood, with Ionic pilasters, designed in a way that suggested wood, and with a charming gallery running around it. Dance also built Newgate, one of the most expressive structures in London, and having its purpose stamped upon its face (applause). As to the two orders on the west front of St. Paul's, it was not his province to say what should have been done with one order. It was for Wren to do that, and for them to talk about it (laughter). But if Wren had taken the problem thoroughly in hand, he would have made a great deal of the opportunity. With regard to the Burlington House colonnade, he understood that it was not in such a ruinous condition as was commonly supposed. It seemed that an effort had recently been made to get the Board of Works to do something with it; but the idea was voted down, and the question had to be abandoned.

\* See *Builder*, March 3, 1888, p. 150.

## COMPETITIONS.

*The Castle Mona Hotel and Pleasure Grounds.*—In this competition we are informed that the first premium has been awarded to Mr. W. H. Fletcher, of 13, Berners-street, W., and Mr. John Ladds, of 4, Chapel-street, Bedford-row, W.C., joint architects.

*Board Schools, Beasley Heath.*—The *Beasley Heath Observer* of Feb. 16, contains an account of the meeting of the Dartford School Board for awarding the premiums in the competition for the West Hill Board Schools. We gather that the four designs selected by the committee were as follows, viz.:—First premium to the design bearing the motto "School Architecture," by Mr. E. Fincher, architect, West Bromwich; second premium awarded to the design "In Vitae," by Mr. Horace T. Bonner, architect, London. The designs placed third and fourth were "Fitness and Economy," by Messrs. Marshall & Pictor, 7, Great Queen-street, Westminster; and "Oehlmer," by Mr. F. Whitmore, Chelmsford. There were sixteen designs sent in. The report of the proceedings is amusing as showing the way in which competitions are decided when there is no professional assessors. Efforts were made to award the first premium to a local man, whose name and the motto of his design were freely mentioned during the discussion. But the Chairman and the majority of the members of the Board were evidently intent on coming to an honest decision in the matter, and were not caught by the usual claptrap as to studying the interests of the ratepayers, which was given utterance to by those who supported the "local man's" design. The authorship of this design was stated by one member to have been revealed by the handwriting of its author upon the plans. In no other way?

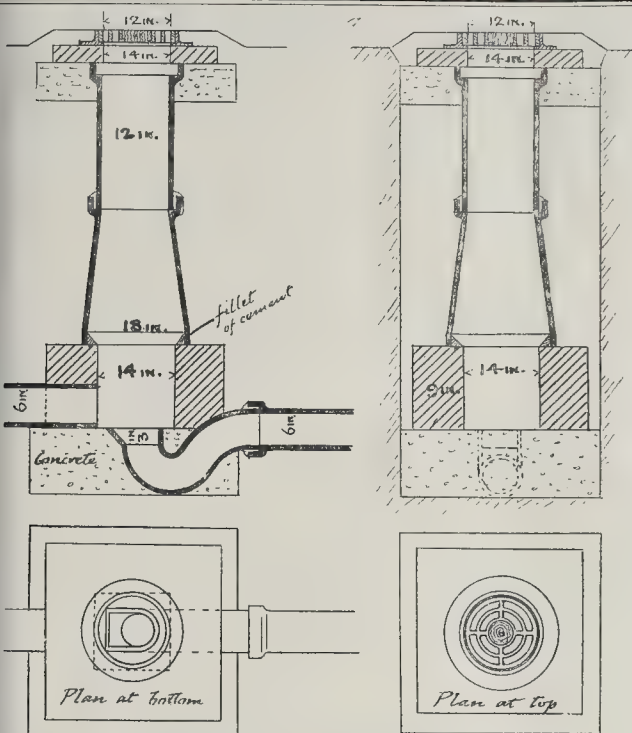
## ARCHITECTURAL SOCIETIES.

*Birmingham Architectural Association.*—A well-attended meeting of this Association was held on Tuesday evening last, at Queen's College, among those present being Mr. W. Doubleday (Vice-President), Messrs. W. H. Birklake, J. W. Bradley, J. Cotton, H. E. McConnell, W. H. Kendrick, J. Ward, and H. R. Lloyd (Hon. Sec.). A paper was read by Mr. J. A. Jones, A.R.I.B.A., entitled "Five Famous Domes," and which treated of the chief historical, constructive, and artistic characteristics of the domes of the Pantheon, Rome; Sta. Sophia, Constantinople; The Duomo, Florence; St. Peter's, Rome; and St. Paul's, London. After describing the distinctive features of each dome, Mr. Jones closed his paper by a comparative criticism, in which he spoke of Sta. Sophia as having the greatest internal and St. Paul's as the greatest external beauty; of the Florence dome as a masterpiece of construction, and of St. Peter's as a masterpiece of construction and architecture. The paper was followed by a hearty vote of thanks to Mr. Jones, and after an announcement by Mr. Lloyd (Hon. Sec.) that the scheme of affiliation with the Architectural Association, London, was now fully arranged, the meeting ended.

*Glasgow Architectural Society.*—On Monday evening last the Architectural Section of the Glasgow Philosophical Society met in the Philosophical-rooms, Bath-street, Mr. James Thomson presiding, when a paper on "Developments in Architecture" was read by Mr. David Thomson, in the course of which he traced the various developments of the different styles of architecture, and remarked that a small but highly-gifted section of the profession were striving to graft upon the picturesque qualities of Gothic art the beauty and delicacy of Classic enrichment, and they had good reason to expect that with a still more extended knowledge of all art, and with the increasing facility in drawing and design, some new development of architectural style might gain a permanent ascendancy with the higher-educated classes, and might in time emerge in some style of a truly national character,—a style understood and appreciated by the whole people, and one in which all the arts and crafts would find a fitting expression.

*The Helsingfors Exhibition, 1890.*—The Finnish Government has received a number of petitions from manufacturers praying for the holding of an Industrial Exhibition at Helsingfors next year. This would be the first exhibition of this kind held in Finland.





Disconnecting Trap and Air-inlet (not in a road).

## PAYMENT TO ARCHITECT BY THE CONTRACTOR.

SIR,—I have recently come across what I think to be rather a novelty in the way of conducting business between architect, client, and builder. I have been invited to tender for work, and one of the conditions states that the architect is to be paid 1s. by the builder each time a certificate is given or payment on account. These fees are not in lieu of the now too-frequent charge for copy of drawings and specification, as that charge is also provided for by another clause.

Never having experienced this condition before, I should be glad to hear whether any of your readers have met with the same peculiar arrangement in their contracts. AN INQUIRER.

\*\*\* The condition appears to us to be a most improper one. It is the architect's duty to give the builder a certificate when the stipulated amount of work has been properly done.

## The Student's Column.

## TOWN DRAINAGE.

## VIII.—PIPE INLET NEAR A SEWER.

AN intercepting or disconnection trap on a house drain placed near a sewer requires an air shaft or chamber on its upper side,—that is on the side nearest the sewer to be drained,—and this serves the purpose so of access to the trap, which we said in a former article was necessary. If the depth of the drain at the point where the trap is to be placed is not more than 5 ft. or 6 ft., and the question is such that the top of the cover may be raised above the surface,—that is, if it is not a roadway or footway,—a pipe of 12 in. diameter is sufficient. A smaller pipe would be inefficient were it not that a large grating is necessary for the admission of air to the drain. These minute things with holes which one sometimes sees over drains are of no use in this situation; they allow little if any air to pass through them. The area of all the openings in a grating should exceed, considerably, the sectional area of the drain-pipe; half as much will be insufficient; it should be nearly twice the area; and for a 6-in. drain the aggregate area of the openings in the grating should not be less than 60 sq. in. It must be considered that the air which is necessary to be supplied

to the drain through these openings cannot have any great velocity; there is no force in any part of the drain to create any great movement of the air through it, and the only means of inducing a gentle current is to make the entrance easy.

In forming the inlet shaft with pipes, as shown in the figure, the cover should be raised above the surface of the ground, a few inches at least, to prevent dirt and stones falling through into the trap; it is, therefore, unsuitable for a roadway or footway. In either of these situations a dirt-box should be suspended under the grating to catch the dirt and stones which always fall through; but in a pipe there is no room for it without blocking up the airway more than is desirable. In a roadway or paved area, therefore, a brick shaft or chamber is the proper thing, whatever the depth be, and where the depth is considerable there is the additional reason for a brick shaft, that room must be given for a man to go down when it may be necessary. Also, when branch drains are joined with the main drain at this point, where the principal air inlet is formed, a brick shaft or chamber is much better than a pipe. Nevertheless, for its proper situation it is sufficient, and may be formed of two pipes, the lower one being a taper pipe, the diameters of its two ends being 18 in. and 12 in., with a straight 12-in. pipe upon it; and the taper pipe should be set upon a few courses of bricks 14 in. square inside, bedded upon concrete, in which the trap is set; and the frame of the grating may be bedded upon a single course of bricks set upon a small bed of concrete surrounding the pipe. The trap can be reached, with a proper rake, from the surface of the ground. As to the bed of concrete at the bottom of the pipe trench, there is no great weight to be carried by it, and it is chiefly of use for surrounding the trap after it has been properly fixed, with its inlet and outlet truly horizontal, and ascertained to be so either with a level or by filling it with water; after which it is kept in position by supporting it all round. For this purpose lime-concrete is sufficient. The bricks are cut where required for solid bedding over the pipe, and laid in cement, or hydraulic lime-mortar; and if this kind of lime be used for the concrete, which it is best to do, the same can be used for the mortar with two measures of clean, sharp sand to one of

lime. When the taper-pipe has been set it is surrounded with the earth excavated from the trench, and rammed in thin layers, and so to the top after the second pipe has been set, if the excavated earth is at all suitable for being rammed solid, so that no further sinking can take place; otherwise the concrete should be continued to the top. The pipes may be dispensed with altogether if Portland-cement concrete be used, and a faced core 12 in. in diameter be fixed and surrounded with concrete 8 in. in thickness, or if boards be placed across the trench so as to confine the concrete to a thickness of not less than 6 in. next the opening.

## Books.

*A Dictionary of the Leading Technical and Trade Terms of Architectural Design and Building Construction.* By the Editor of *The Technical Journal and Industrial Self-Instructor.* (Ward, Lock, & Co., London and New York, 1888.)

THE idea in which this technical dictionary originated is an excellent one, and if well carried out would provide a work alike useful to the architect, the builder, and the operative. To say of the present volume that it is incomplete and not quite accurate is only to say what may be said of every work that ever was published. But, apart from the impossibility of producing a faultless work on so large and varied a subject, it is possible to improve very much upon this present attempt.

In the first place, it is cumbered with many words which cannot properly be called, in the ordinary sense of the word, "technical," such as "back-door," "back-room," "billiard-room," "new work," &c., the signification of which is not sufficiently recondite to warrant their finding a place in a dictionary of this kind. Their room would be more valuable than their company. He must be a very uneducated self-instructor who had to consult a dictionary to find the meaning of "back-door."

In the second place, many words which would naturally be looked for in such a work are absent, *e.g.*, frieze, wainscot, rood-screen, &c.

Again, some of the descriptions are written without proper acquaintance with the subject. For instance, under "beam," we are told that "where it resists compression it is a collar-beam." In some cases the wording is infelicitous, as witness the following explanation of "bed-mold,"—which is described as "that part of a cornice which lies immediately below the lowest part of the cornice or the corona." Any one knowing already what a bed-mold is will see what is meant; but it is doubtful whether the novice would obtain much light therefrom; nor would the "industrial self-instructor," for whom the work is mainly designed, be very clear as to the exact meaning of the term "extrados" by this, the only explanation afforded him,—"*Extrados, in architecture—pron. ex-trah-doss; Ger. äussere wölbung (äussere, outwards, wölbung, a vault),—pron. oy-serr-eh voel-boong.*"

In some cases the confiding student would be grievously led astray, as when, for instance, at p. 98, the Grecian orders are said to be three in number,—Doric, Ionic, and Composite; and if the periods of Gothic architecture given at p. 97, as (1) Saxon, (2) Norman, (3) Early English, (4) Perpendicular, (5) Decorated, may be ascribed to a slip of the pen, all we can say is that, in a work of this character, which is the special resource of the unlearned, such slips are very unfortunate, and should be carefully guarded against.

There is "some fine confused reading" at p. 118, where a reredos is described as something which is sometimes placed behind the altar, but generally separating the chancel from the body of the church. It is plain that the writer had no clear idea what a reredos really is, or has but little skill in exposition.

These and similar blemishes appear throughout the book; at p. 189 a "true roof-truss" is described as one in which "the rafters butt at their lower ends at the foot of the vertical post called the king-post;" and there are other mistakes quite as unfortunate which we have noted, but forbear to particularise, having said enough to show that the ground should be gone over again carefully before the book can be regarded as reasonably perfect.

The etymologies are generally in accord with Skeat, Chambers, and other standard authorities, and are very interesting; as are the French and German analogues; although the attempts



to give, phonetically, the pronunciation of foreign words are not more successful than usual. If the quantities of the Latin words had been indicated in the conventional way, some further help would have been afforded to those who require it; and, finally, we should like to see a few more references to the Anglo-Saxon roots for terms derived from a native source.

Still, there is very much in the book which is accurate, and will be found useful. The editor had to grapple with a large subject, and has, at any rate, furnished a basis for a useful work of reference. In its present state, however, it must be read by all, and especially by the "industrial self-instructor," with discrimination.

*The Orient Line Guide; Chapters for Travellers by Sea and Land.* Edited by W. J. LOFTIE, B.A., F.S.A. (London: Sampson Low, Marston, Searle, & Rivington; and Edward Stanford. 1888.)

"THE Orient Line Guide" is, in fact, a collection of essays by "eminent hands," edited by Mr. W. J. Loftie, and dealing with everything of interest to the traveller to the Far East. The quality of the information may be inferred from the names of the contributors, amongst whom are Mrs. Fawcett, whose description of Naples, the cities of Italy, and the route home through Europe are one of the best sections of the book; Mr. David Hannay, who has given stirring accounts of the great naval battles in the Orient route; Mr. J. Struther, who treats in a sensible and interesting way of health at sea, showing what a sea trip can and what it cannot do for the invalid; and Mr. W. B. Richmond, who has some charming notes on journeyings in Greece. Natural history under the sea occupies the pen of the Rev. C. H. Middleton Wake, and Mr. Norman Lockyer deals with the method of reckoning the time at sea and of finding the ship's daily course. Astronomy, meteorology, navigation, and historical and statistical accounts of the Australian Colonies, Tasmania, and New Zealand all find a place in this amazing little volume, which is copiously illustrated by maps of celestial and terrestrial charts, diagrams, views of places of interest to travellers, portraits and plans of ships, and a really beautiful frontispiece from the pencil of Miss Kate Greenaway. The whole is well written, well printed, well illustrated, well indexed, and well bound, and all for the small charge of half-a-crown.

The managers of the Orient Line seek to obtain for their vessels swiftness, comfort, and safety, and boast that they have achieved all three. They have made the journey from Plymouth to King George's Sound in twenty-seven days. The interiors of their magnificent ships have been liberally and thoughtfully arranged, fitted from designs by Mr. J. J. Stevenson and adorned with pictures by Messrs. Wyllie, O'Connor, Pettie, and other artists of high reputation. The latest-built vessels are lighted by incandescent electric lamps, furnished abundantly with baths, refrigerators, and steam-worked punkahs, and out of 150,000 passengers carried across the seas in the first ten years of the company's existence, not one has lost his life by shipwreck.

We cannot spare room for a detailed discussion of the several points suggested in this book of special interest to the architect. Such subjects have necessarily been merely glanced at by the authors, a page to Gibraltar, a page to Malta, and so on. We are not of opinion that St. John's Cathedral, at Valetta, is the ugliest church in the world, or that the Maltese architecture generally is disappointing, and there are similar criticisms in the book with which we do not agree. The book might be improved in this respect. But passing from opinion to facts, Mr. Loftie states as a fact, that the Tilbury Fort Gateway, which all travellers by the Orient Line must remark, was designed by Sir Christopher Wren, and built at the orders of Samuel Pepys. We can well believe it,\* but we have never found any documentary warrant for the belief. If Mr. Loftie has met with such we should be obliged by receiving particulars. The Chapel in the Fort is not as old as Queen Elizabeth, and a man of Mr. Loftie's archaeological attainments should not say that it is. These are, however, small blemishes in an excellent work, and can be easily set right in that fourth edition which will probably be called for.

\* See article in the *Builder* for Sept. 1, 1888, entitled "Tilbury Fort."

*The Model Engineer's Handy-book; a Practical Manual on Model Steam-engines.* By PAUL N. HASLUCK. (London: Crosby Lockwood & Son.)

It would be difficult to estimate,—perhaps we might say difficult to over-estimate,—how much the engineering supremacy, which we hope England may still claim to possess, owes to the model engines that have formed the toys of many a lad who has afterwards grown into an engineer of note. It is true of the mechanical arts, as of all others which are followed as a profession, that no man ever made his mark who had not a love for his work; and how often has the good seed been sown by a toy locomotive or a model steamer! From this point of view, Mr. Hasluck's latest volume is of greater importance than would at first appear; and, indeed, he has produced a very good little book. It is written in a style that his readers are likely to understand, and, what is of almost equal importance, not beyond the exchequer of any ordinary schoolboy who will be content to eschew gingerbread and lollipops for a week or so.

The author commences with "The Principles of the Steam Engine," a subject he treats briefly but in a plain manner. He then gives descriptions of various types of model-engines usually sold in the shops, and afterwards goes on to treat of the various parts which go to compose engines and boilers. This latter section naturally occupies the greater part of the book. In the present day the way is made very smooth for the model-engine maker, as nearly all the parts can be bought ready-made at the "model dockyards." Years ago it was a real feat to make a model-engine, for the constructor had to go through all the processes of a complete engineering works in miniature. Nowadays, it has resolved itself into a process of "erecting" only.

*Marine Engines and Boilers.* By GEORGE C. V. HOLMES. (London: Chapman & Hall.)

THIS little book affords an excellent illustration of Huxley's apothegm, "How excellent a thing it is to know a great deal in order to say a little." Writers of the class of book to which Mr. Holmes has here devoted himself generally act on an exactly opposite principle; for this volume is in reality no more than a guide to the models in the South Kensington Museum. These models, however, form an excellent text upon which to found a history of marine engines and boilers, and as Mr. Holmes possesses the requisite knowledge of the subject, both historical and scientific, in addition to a good literary style, those who would get general information in this direction cannot do better than consult the book under notice. We have been unable to detect any statements to which we could take exception, and the only advice we will venture to offer to the author is to try and find a publisher who will issue his work with the pages cut. Every one knows what testy beings book reviewers are, and nothing is more calculated to ruffle their serenity than that return to a darker age,—an uncut volume. We are thankful to say that this detestable practice, now so fashionable amongst a certain class of publishers of more frivolous literature, has not gained a footing with those who produce scientific works. An uncut guide-book, however, seems the height of inconvenience.

*Practical Perspective by a Draughtsman: Means, Course, and Operations.* Fully illustrated in detail. Hammersmith: F. O. Ferguson & Co. This is simply a large folded sheet of paper, with a few brief notes and instructions, and a series of small diagrams, showing the whole course of putting a small house into perspective, beginning with a plan of the drawing-board, with the block-plan of the house laid down above the space where the drawing is to be made. Even the use of the T-square and set-square in transferring points on the plan to the verticals of the view is indicated, and the various lines of construction necessary to lay down successively the ground-line of the plan in perspective, the projection of the roofs, the position and height of chimneys, bays, turrets, and gables are shown by dotted lines in successive diagrams, so that the learner seems to see the process of making the drawing going on before his eyes. The whole thing is very ingenious and practical, and could hardly fail to be useful to beginners who may not be in the way of immediate teaching and illustration by an instructor.

*Supplement to Carpmael's Patent Laws of the World.* Edited by a Committee of Fellows of the Institute of Patent Agents. (London: William Clowes & Sons, Limited. 1889.)

UNTIL a new edition appears of Carpmael's "Patent Laws of the World," this supplement is an indispensable addition to that work. Mr. Carpmael's book was a much-needed one, but it cannot now be considered complete without this supplement. The latter is simply a collection of the statutes and proclamations on the subject of patents which have been promulgated since the publication of the parent work. These laws are arranged alphabetically under the heads of each separate nation or colony. There is, for example, the new Swiss Patent Law, which came into operation on the 15th of January. Moving from Europe to Africa, we find the law of June 1st, 1887, of the South African Republic, relating to patents. It is sufficient in this place to call attention to the nature of the present supplement; to criticise the material embodied in it would embark upon a prolonged discussion and criticism of the patent laws of a large part of the civilised world. It is sufficient, therefore, to say that this supplement is as indispensable to any one who has to do with patents as is the original work.

*Foreign Visitors in England, and what they have thought of us.* Being some notes of their books and their opinions during the last three centuries. By EDWARD SMITH. (Ellis Stock, London. 1889.)

THE present volume of "The Book Lover's Library" is little more than an abridgment of "England as seen by Foreigners in the days of Elizabeth and James I.," by Mr. William Brencley Rye, with some additions bringing almost down to date. The subject is susceptible of being woven into an interesting narrative, but as here presented is fragmentary, and, like Hamlet, "too full of quotations."

The mirror which the illustrious stranger holds up to nature is generally, in fact, a lens and the distortion of our characters, appearance, habits, &c., is due to its particular sphericity,—representing us as angels of light, monsters of iniquity as the case may be.

The various estimates of us extend through vast range, and we can take our choice. Miss in the seventeenth century found us generous, upright of heart, full of piety, charity, wisdom and goodness itself,—better loved the more we are known. Others have found us something very much the reverse of all this! Hawthorne who lived amongst us but yesterday, could say but little in us that was admirable, set John Bull down as "a rough animal," and his friends like unto him.

Many of our foibles are held up to reprobation by our critical guests,—our gluttony, drinking love of cruel sports, &c., &c.,—and to many of these charges we can only plead guilty. It is something, however, to find the majority of our visitors agreed as to the beauty of Englishwomen. They are "the greatest beauties in the world," "as fair as alabaster," "cheerful, courteous, of good address," "have the finest hair in the world," "are obliged to nature alone for their complexions" (oh!) "of marvellous beauty and wonderfully clever." This is a moderate sample of the praises lavished on Englishwomen, as Mercutio says:—"Twill serve."

The book is a chatty, scrappy little volume which can scarcely be opened without disclosing something worth reading; but which might have been made more generally satisfactory greater care in its arrangement.

*Modern Workshop Practice as applied to Marine Land, and Locomotive Engines, Floating Docks, Dredging Machines, Bridges, Ship Building, Cranes, &c.* By JOHN G. WINTERS. (London: Crosby Lockwood & Son.)

THE title of this book,—we have quoted it full for a purpose,—is against it. The volume, a fourth edition, is one of the well-known great covered "Weale's Rudimentary Series." It beyond comprehension how any one can hope to say a title that ought to be said on various subjects enumerated above in an octavo of 342 pages; but, as if the range was not wide enough, the publishers' preface to the new edition tells us that there have been added "practical details of gas and its manufacture, also account of steam fire-engines, and of work done by manual and steam fire-engines, &c." do not propose any detailed criticism of mass of matter the author has brought together.



out in turning over the pages of the book we find that about half of them have been given up to ship-building and the marine engine. Perhaps no better index of the author's ability to deal with his subject could be found than in the fact that he refers to the Institution of Naval Architects as the "Naval Architects' Institute." Following on the passage in which this expression occurs we find it refers to "a recent communication" (the italics are ours) to the "Institute" made by Mr. Robert Murray. In order to ascertain the value of the word "recent" we turn to the title-page, and find the date of the issue of the book to be 1889; and further, in the publishers' preface, or advertisement, it is stated that: "A new edition of this standard book being called for, the opportunity has been taken by the author to revise it throughout, so as to embody results of recent engineering practice." Now, this "recent communication," in a book which is stated to "embody results of recent engineering practice," refers to that part of ancient history which treats of the Royal Mail Company's steamers *Rhone* and *Douro*,—vessels steaming 10½ to 11 knots, with engines developing 500 horse-power, and burning 35 tons of coal a day, and working at 20 lb. pressure. This is the sort of thing "Weale's Series" gives us under the heading of "Modern Workshop Practice"! "Ea pede Herculem." We turn over a page or two and find instructions for the making of marine boilers. There are pictures of square boilers, but the cylindrical type appears to be unknown to the illustrator of this "modern" work. Next, the boiler-maker is instructed as to the thickness of plates required, but whether the figures refer to iron or steel there is nothing here to show; and, again, iron seems to be thought the only possible material that a modern engineer is likely to use in engine-framings. The other details are on a par. Old-fashioned slot-links are illustrated, propellers are only shown with the blades cast solid on the boss, and no reference is made to manganese-bronze. Cast iron, again, seems to be thought the only material suitable for pistons, and so on to the end of the chapter, until we arrive at the subject of floating docks and the end of our patience.

If books of this class were only offered to grown men of experience, we should not consider it worth while to give space for their notice. Unfortunately, many young men, at the beginning of their career, are induced to spend money, which they can ill afford, by the specious promises of the title-page and publisher's advertisement. Such works as this, which is an example of too many in the "Weale's Series," are no credit to the author, certainly not to the publishers, nor, indeed, to the engineering Press, which ought to do more towards rendering their sale impossible.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

2,081, Sharpening Saws, &c. J. and J. HILL. The machine which is the subject of this invention consists of a pillar, upon which is attached all the brackets and parts of the machine. Mechanical attachments and contrivances are provided for keeping the saw in place, and also for actuating all emery wheels, grinders, or milling tools. The bracket is also provided with a rack and pinion for raising and lowering purposes, as occasion requires.

3,821, Paint Brushes. W. F. HURDALL. The object of this invention is the binding and filling of brushes when new, to prevent them from being too flexible or spreading. At present the custom is to bind them round with string, but this is a metal shield is used, which is fixed by clips. The shield is made to curve little off from the bristles at the edge, to prevent the edge of the shield from cutting the bristles.

15,058, Valve Apparatus for Ventilation or Air Supply. W. LÖNNHÖLDT (Berlin). By this invention the apparatus can be used both for ventilating and for hot-air supply, without necessitating any change of form, but only requiring to be inverted, whereas in such apparatus as is seen heretofore employed a change of form was required for adapting it to the one or the other use.

4,208, Opening Doors Electrically or Pneumatically. C. W. THODE.

The object of this invention is to facilitate the opening of doors from a central station. Both doors are balanced by counter-weighted levers and held in position by a spring click, which is released pneumatically or electrically. The doors are opened by the action of weighted levers at the

side. The doors may be reclosed and bolted by fixing the spring click again in position.

17,779, Improvements in Filling used by Painters. S. DOWNS and W. GREENWOOD.

In order to obtain a better surface, and to dispense with the labour of rubbing down, this inventor uses a compound of lead, dryers, gold size, and turpentine, mixed to a paste. This is put on with a broad-pointed knife, and levelled by a steel straight edge.

18,070, Improved Chimney-pot. T. A. ALDRIDGE.

In the chimney-pot which is the subject of this patent, a combined double cone or partly conical and partly funnel-shaped enclosure, with movable flaps, surmounts the pipe. By the position of the baffles and orifice the greatest draft is ensured.

18,766, Fireproof Iron Buildings. E. J. WESTON (San Francisco).

This invention relates to a method of construction consisting of a comparatively light fireproof framework for buildings, where, it is claimed, they may be safely erected to great heights without danger of the falling of the walls by reason of earthquakes or fire. Such structures can also suitably be built in locations where difficulty exists in finding a suitable foundation for heavy walls of masonry. The system is also specially adapted to the construction of tall towers, chimneys, &c. The uprights are formed of I beams of wrought iron, of diagonally-based frames or open panels of cast iron adapted to fit closely between the uprights and to be confined by the flanges thereof. Plates of channel beams bind, support, and strengthen the structure.

## NEW APPLICATIONS FOR PATENTS.

Feb. 4.—1,937, W. Higgins, Preparing Slates for Building Purposes.—1,941, W. Longley, Fire-resisting Doors or Shutters.—1,945, A. Clifford, Ventilator.—1,952, J. Merryweather, Paving.

Feb. 5.—2,023, J. Johnson, Rain Water Downspouts.—2,034, F. Scattergood, Indicator for Doors.—2,035, F. Salt jun., Window-fastener.—2,049, H. Young, Machines for Cutting Stone.—2,061, E. Edwards, Holding open Windows in any Position.—2,083, W. Thompson, Door Check and Spring.

Feb. 6.—2,121, G. Wright, Block Tile or Slab for Building Purposes, &c.—2,134, H. Enoch, Water-waste Preventers for Water-closets.—2,155, N. Sorenson, Door-locks, &c.

Feb. 7.—2,167, H. Wazgett, Nails.—2,171, E. Lund, Bookcases.—2,207, J. Day, Syphon Flushing Apparatus for Water-closets.—2,237, C. Smith, Fastenings for Windows, &c.

Feb. 8.—2,254, W. Pearce, Window-catch.—2,257, A. Bostock, Window-sash Fasteners.—2,289, J. Homan, Fireproof Structures and Bricks for same.

Feb. 9.—2,308, R. Somerville, Combination Screw and Nail Dowel.—2,319, R. Livingston, Opening and Closing Casements, Skylights, &c.—2,321, P. A. Lerne, Sash or Window Fasteners.—2,347, J. Gunter and J. Langer, Girders and Channels.—2,353, J. Edwards, Sash Fasteners.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

17,949, R. Hudson, Hinges and Bolts for Gates and Doors.—18,482, G. and H. Schbok, Artificial Stone, Cement, Plasters, &c.—18,507, J. Davis, Mitre Joinery Appliances.—18,552, A. Clifford, Teething Drain-pipes, &c.—18,606, D. Howarth, Lavatory Fittings, &c.—18,705, H. Condy, White Lead.—18,810, H. Faulkner, Lustration Polished Marbles, Granite, Tiles, &c.—18,865, T. Twyford, Water-closets.—18,993, C. Geun, Air-inlet Ventilators.—174, I. Birker, Hoists or Lifts.—193, A. Valgnier, Hydraulic Lift or Hoist.—355, F. Trier, Machinery for Working Stone.—368, H. Crews, Convertible Steps and Folding Ladder.—401, C. Elliott, Chimney-top Cowl.—469, G. Fry, Warning and Ventilating Houses, &c.—482, J. Tolerton and J. Darnley, Fasteners for Doors, &c.—589, J. Kemsley, Ventilating.—638, G. Jennings, Water-closet Valves.—694, R. Suter, Frost-proof Pipes, &c.—727, W. Thompson, Sauters for Windows, Doors, &c.—728, W. Thompson, Safety Bars for Doors, Windows, &c.—801, H. Hall, Tiles for Lining Walls, &c.—847, E. Edwards, Composition for Paint or Varnish.—907, J. Woodward, Securing Sash-lines to Sashes.—980, R. Hitchcock, Construction of Ceilings.—1,025, E. Kingworth, Windows.—1,120, B. Smith and F. Taylor, Combination Tile and Gutter for Roofing.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

3,743, G. Garrard, Roofing, Wall, or Hanging Tiles, &c.—4,373, T. Twyford, Lavatory Basins, &c.—4,568, T. Wilson, Water-taps.—5,169, W. B. acwell and W. Hayhurst, Joiners' Cramps, &c.—5,363, S. Hazeland, Woodworkers' Plane Irons.—7,594, G. Eland, Drying and Seasoning Timber, &c.—8,993, W. Sayer, Bricks, Tiles, &c.—16,737, T. Leblon, Mosaic Tile.—16,854, A. Del Guerra and D. Stefani, Securing Doors.—18,083, J. Strachan and J. Alletted, Securing Sash lines to Sashes.—18,708, E. Edwards, Waterproof Roofing Material.—18,767, T. Martin, Door Locks.

RECENT SALES OF PROPERTY.  
ESTATE EXCHANGE REPORT.

## FEB. 4.

By WORMFOLD & HATWARD (at Dover).

Dover—4, Cowgate-hill, freehold..... £265  
31 Commercial Quay, 81 years, ground-rent £2..... 230  
Charlton—43, Peter-street, freehold..... 170  
Rwell—Four freehold cottages..... 405  
Buckland—5 and 6, Primrose-road, freehold..... 320

## FEB. 11.

By WYATT & SON (at Chichester).

Chichester—Two freehold houses with shops..... 840  
A freehold spirits store..... 1,150  
Theatre-lane—Five cottages, 32 years, ground-rent 2s. 6d..... 210

## FEB. 12.

By WRIGHT & CO.

Spitalfields—The lease of 28, Brick-lane, term 8 years..... 263  
Dockhead—The lease and goodwill of 243, Tooley-street, term 8½ years..... 255

## By BOYCE &amp; EVANS.

Horton—25 to 33, Newton-street, 47 years, ground-rent £30..... 2,865  
108, 110, and 112, Horton-street, 90 years, ground-rent £72..... 1,595  
13 to 21 odd, Emsworth-street, 30 years, ground-rent £21..... 910  
14, 16, and 18, Alma-street, 40 years, ground-rent £15..... 1,035

## FEB. 13.

By P. HOBSON.

Stroud Green-road—Ground-rent of £17, 17s., term 75 years..... 283  
King's-cross—16 and 18, Swinton-street, 63 years, ground-rent £16..... 900  
Mildmay Park—7 and 9, Jude-street, 44 years, ground-rent £8..... 460

By THOMAS & GRIFFIN.

King's-cross, Acton-street, and King's-cross-road—A moiety of an improved ground-rent of £100, term 45 years..... 825

By W. E. NICHOLAS.

West Kensington—19, Castletown-road, 87 years, ground-rent £14..... 579

By D. YOUNG.

South Lambeth—187, South Lambeth-road, 76 years, ground-rent £18, 1s..... 800  
Denmark Hill, Olive-terrace—Improved ground-rent of £8, 7s., term 93 years..... 120

By C. P. WHITELEY.

Swansea, near The Lodge—Siemens Steel Works, with plant and machinery and leasehold land, together with the ironworks and collieries..... 101,000  
Regent's Park—27, Redhill-street, 36 years, ground-rent £8, 12s..... 219

## FEB. 14.

By C. C. & T. MOORE.

Islington—10, Liverpool-street, 33 years, ground-rent £9, 15s..... 240  
Shadwell—6 to 11, Pope's-hill, 10 years, ground-rent £25..... 150

By H. J. BLISS & SONS.

Mill End—28 and 30, Sceptre-street, freehold..... 560

By E. SIMMONS.

Brixton—112 and 114, Holland-road, 34 years, ground-rent £10, 10s..... 335  
Camberwell—121, 123, and 125, Nott-street, and 1 and 3, Herring-street, 25 years, ground-rent £22..... 210  
Peckham—7 and 8, Beaufort-terrace, 46 years, ground-rent £10..... 375  
61, Oakhurst-grove, 78 years, ground-rent £7, 10s..... 230

## MEETINGS.

## SATURDAY, FEBRUARY 23.

Architectural Association.—Second Sessional Visit to various works in Charing Cross-road. (See advt.)  
Builders' Women and Clerks of Works' Institution.—Annual Dinner, Holborn Restaurant, 8 p.m.  
Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation, Wave Theory)." 3 p.m.  
Edinburgh Architectural Association.—Visit to Craigmoad Tower, Lauriston Castle, and Barnton Grounds.

## MONDAY, FEBRUARY 25.

Royal Institute of British Architects.—Mr. T. M. Rickman, F.S.A., on "Writing a Specification." 8 p.m.  
Surveyors' Institution.—Adjourned discussion on Mr. Josiah Hunt's paper on "Quantity Surveyors: their Duties, Rights, and Liabilities." 8 p.m.  
Royal Academy (Lectures in Sculpture).—Mr. A. S. Murray on "Ancient Sculpture in Bronze: statuary." III. 8 p.m.  
Builders' Clerks' Benevolent Institution.—Annual Meeting. 7 p.m.

## TUESDAY, FEBRUARY 26.

Society of Arts (Applied Art Section).—Mr. W. H. J. Weale on "English Bookbinding in the Reign of Henry VIII." 8 p.m.  
Institution of Civil Engineers.—Further discussion on Mr. Gilbert Kapp's paper on "Alternate-Current Machinery." 8 p.m.

## WEDNESDAY, FEBRUARY 27.

Carpenters' Hall (London Wall).—Professor W. Ramsey, F.R.S., on "The Ventilation of Buildings through their Walls." 8 p.m.  
Society of Arts.—Mr. Alan S. Cole on "The Irish Lacy Industry." 8 p.m.  
St. Paul's Ecclesiastical Society.—Rev. E. S. Dewick on "Christian Art on Coins from the time of Constantine the Great." 7.30 p.m.  
Inventors' Institute.—8 p.m.

## THURSDAY, FEBRUARY 28.

Society for the Encouragement of the Fine Arts.—Mr. C. Pfundner on "Religions and Arts of the Extreme Orient." 8 p.m.  
Sanitary Institute.—Colonel W. Hope on "The Metropolitan Sewage Question." 5 p.m.  
Society of Antiquaries.—8.30 p.m.



FRIDAY, MARCH 1.

*Architectural Association.*—Mr. J. T. Michlethwaite on "The Life of an Old Parish Church," 7.30 p.m.

SATURDAY, MARCH 2.

*Association of Public Sanitary Inspectors.*—Sixth Annual Dinner, First Avenue Hotel, Holborn. 8 p.m.  
*Royal Institution.*—The Rt. Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation; Wave Theory)." II. 9 p.m.

### Miscellaneous.

**Foundations in Tunis.**—The *Génie Civil* describes the foundations for buildings in modern Tunis, a section of the City which is built on marshy ground. The subsoil is an oozy sediment, largely deposited by the sewage water from the ancient, or Arab, quarter of the city, which is situated on an adjacent hill. This semi-fluid mud has a depth of about 33 ft. To prepare the soil for supporting an ordinary house, pits from 8 to 10 ft. square are excavated to a depth of about 10 ft., to the level of the ground water. A mixture is made of the excavated soil and powdered fat lime, procured from clinkers and unburnt stone from the lime-kilns, which soon crumbles to fine dust when exposed to the air. The mixture is thrown into the pits in layers about 1 ft. thick, and rammed down for a very long time by specially-trained labourers. A gang of fifteen or twenty men will work at least ten or twelve days ramming for the foundations of a moderate-sized house. An extremely hard bed is thus obtained, reaching to within 18 in. of the surface of the ground, and on this artificial bed the foundations of the building are laid. Although this method of construction is crude, it is stated that the practical results are superior to those obtained by using piles, concrete, or other recognised methods, and in all cases the cost is much less, for labour is cheap.

**The Iron, Hardware, and Metal Trades' Pension Society.**—Mr. Alexander Ritchie, of Messrs. Steven Bros. & Co., the London house of Messrs. McDowall, Steven, & Co., Milton Ironworks, Glasgow, presided at the thirty-third annual Ball in aid of this charity, which took place at Willis's Rooms, St. James's, on Thursday, the 14th instant. The company assembled numbered about 300. During the evening the announcement was made of contributions, collected by the chairman in aid of the fund, exceeding a hundred guineas. The piper boys of the Royal Caledonian Asylum gave a performance, and executed a series of national dances, an innovation which met with warm approval. The Ball, instituted as an auxiliary to the parent fund, was originated thirty-two years ago, and has been the means of producing an aggregate of 2,200*l.*, from which source the executive have been enabled to relieve cases of urgency and distress to which the ordinary funds of the charity are inapplicable.

**The English Iron Trade.**—The English iron market preserves its favourable character. Pig-iron is still in a rising tendency. The Glasgow warrant market has been more active this week, and rates have been advancing. In sympathy with the tone of warrants, Scotch makers have put up their prices from 6d. to 1s. a ton; Cleveland iron is 6d. a ton higher, and has now risen 1s. within a fortnight. In other districts pig-iron is stiff, while Bessemer iron maintains its value well. Finished iron is unchanged, and, save for a reported drop of 2s. 6d. for common bars at Liverpool, which can only be considered temporary, seeing the strong position of crude iron, the market is very steady. The inquiry for tin plates has somewhat revived. Steel still shows a strengthening tendency. Both blooms and slabs are quoted 5s. a ton higher, although trade is quiet. Ship-builders and engineers are as active as ever.—*Iron.*

**Sway (Hants).**—A new chance for the Church of St. Luke, at Sway, New Forest, Hants, was recently consecrated by the bishop of the diocese. The building, designed by Mr. Reginald G. Pinder, F.R.I.B.A., is Early English in style, with red brick copings and weatherings, the only stone used being Bath in the window tracery and finial of gable. The outside face, of red brick, is relieved with a diaper in grey headers, and the inside face is banded with red and yellow bricks and grey headers. The roof is an open-timbered one, covered with grey slates banded with green. The tile floors are by Carter, of Poole. The heating is by Porritt's patent. Messrs. Jenkins & Sons, of Bournemouth, are the builders.

**Break of Railway Gauge.**—A very noteworthy instance of the disadvantages which may be expected to result from the multifarious gauges adopted throughout the Indian railway system has just been reported, and it serves to illustrate how those disadvantages may be further felt as that system becomes extended. The remaining forty-three miles of the Nizam's State Railway now closely approach completion. This line will connect Banakala with Bezvada, the latter place being its terminus on the banks of the River Kistna. On the other side of that river there is the terminus of the Bellary-Kistna Railway, and within a very short time, therefore, passengers arriving by the latter railway will see just before them the commencement of a long stretch of line which only needs the bridging of the river to place them in communication with it. But although the construction of a bridge at that point is both practicable and easy, it will not be worth the while either of the Nizam or of the projectors of the Bellary-Kistna Railway to undertake this work, the Nizam's Railway being of a gauge much narrower than that of the other line. Through traffic is thus denied to all the goods carried by either railway, while passengers by one or the other of them must ferry across the river in order to continue their journey. While admitting that, perhaps, break of gauge in India has been a necessity, such an instance as this fully shows how unfortunate that necessity has been. The extension of Indian railways on such a system in the future must produce many similar results, and the fact should serve as a warning to those in other countries whose progress in railway construction has not yet forced upon them a knowledge of the inconvenience of break of gauge.—*Indian Engineer.*

**Moving Buildings.**—Rather less than a year ago, the Hotel Brighton, one of the largest hotels of Coney Island, New York, was bodily moved a distance of 120 ft. inland. The sea had made such encroachments upon the fore-shore that the safety of the hotel was imperilled, and something had to be done. The hotel had a frontage of 400 ft., and covered an area of 92,000 square ft., the total weight of the building being 5,000 tons. It was lifted on to huge timbers, which rested on 120 railway cars. Six locomotives placed on parallel lines of rails gave a long pull and a strong pull, and the operation was completely successful. The success attending this removal has led to a repetition. Ocean House, another large hotel in the same island, two stories high, and 42 ft. by 55 ft., with a large piazza, was erected twenty years ago, and at that time stood 600 ft. back from high-water mark. The sea washed away the shore so rapidly that the hotel had to be placed on piles two years ago, and it was then considered safe. During a heavy easterly gale in the early winter, however, another slice of the beach was removed, and when the storm had subsided, the hotel was left behind in the Atlantic, some 50 ft. from the new shore, and standing upon its piles. It was at once decided to move it. Messrs. Louis Heinemann & Sons, Brooklyn, undertook the contract, and have just successfully removed the building some 300 ft. back from the beach, or 350 ft. in all. The plan of operation was as follows:—Rows of piles were sunk by hydraulic pressure under the hotel, and reaching to the shore. The piles were then capped, and heavy yellow pine sliding-ways were laid upon them. The hotel was raised upon these ways, and then pulled landwards by crabs on shore, and is now safely located on *terra firma* again.

**Rigid Brass Glazing.**—Mr. W. Gibbs sends us a specimen of stained glass set in brass instead of the ordinary leading, which he claims is stronger and lighter than lead, and safer for domestic windows, as not being liable to be cut into, and does not require saddle-bars. The window submitted to us, of the dimensions of 4 ft. by 2 ft., and mostly in small squares of 3 in. wide, is very rigid, and in this form the glazing answers well; but we think brass has been used in this way before. We doubt whether it would be as tractable and convenient as lead for the various curved lines required in high-class stained-glass design.

**Patent Laws.**—Under the title of "The True Position of Patentees," Mr. H. Moy Thomas has published, through Messrs. Simpkin, Marshall, & Co., a little book, in which the patent laws and regulations at home, abroad, and in our colonies and dependencies, are explained for the information of English inventors.

**American Strikes and Lock-outs.**—Bradstreet's (New York) reports that the labour troubles in the United States during 1888 were not so formidable as in the preceding year. The number of strikes and lock-outs reported was 679, involving 121,841 workmen, against 81 strikes and lock-outs, affecting 345,854 operatives, in 1887. Of the 1888 strikes, by far the larger number were, as in previous years, due to disputes arising out of the wages question or disagreements as to working hours; the percentage of strikes in 1888 being 55, of strikes 68, as against 62 per cent. in both cases in 1887. Pennsylvania still shows the largest number of strikers,—about 45 per cent. in 1888 compared with 32 per cent. in the previous year. The time lost by strikers in 1888 aggregates 7,562,480 working days, against 10,253,921 days in 1887. The total loss of wages from strikes last year was 11,343,720 dols., against 15,380,881 dols. in the preceding year, a saving effected in 1888 of 4,037,161 dols., or 26 per cent.

**The Norwegian Granite Industry.**—The export of hewn granite from Norway has considerably increased of late years, several new quarries having been opened. The chief markets for this stone are England—principally London—and North Germany, the export to this country consisting wholly of kerbstones, whilst to Germany is also shipped finer cut stone for bridges, quay-making, &c. Last year a large quantity of the latter was shipped to Hamburg and Bremen for use in the new custom-houses and quays. In 1888 there were exported 36,000 tons of stone, dead-weight valued at 40,000*l.* In 1887 the export was nearly the same. The demand for the London market remains small, and stocks are rather heavy.

**Eastern Counties Asylum for Idiots.**—Colchester.—A new hospital for thirty-four patients, in connexion with the Eastern Counties Asylum for Idiots, has just been completed, from the designs, and under the supervision, of Mr. R. F. Vallance, architect, Nottingham. Mr. Vallance has been engaged during the last eight years in carrying out additions and alterations at the institution named, his designs for which were selected in open competition in 1881. The hospital building just completed formed no part of the competition scheme, Mr. Vallance receiving the commission for this work in 1887.

**The New Swedish House of Parliament.**—The programme for the competition for the new House of Parliament in Stockholm has now been issued. No estimates of cost at to be furnished by the competitors, the jury appointed making their own estimates on one common basis for all designs. However, the cost of the building itself is not to exceed 200,000*l.* The House of Parliament is to comprise four stories and an *entresol*, and the adjoining National Bank (included in the scheme) a similar number but all fireproof. Up to the present time thirty architects are said to have entered for the competition.

**Spring Hinge.**—Messrs. Moser & Sons have submitted to our notice a very powerful spring hinge for closing doors, which is also very simple in construction and operation, and has the advantage that it can be adjusted for greater power on becoming weakened by use. The inherent defect in all hinges into which spring enters is that they must necessarily become less effective in time, except by such a readjustment as is provided for in the hinge here mentioned. This is made so that the door can be removed without unscrewing the hinge, by the removal of holding-pins on each side of the hinge.

**Ovingdean, Sussex.**—The Ovingdean Estate, near Brighton, is for sale. The property extends over about 350 acres of arable and down land, with farm-buildings, cottages, &c. Ovingdean House stands within a home park of twenty acres, sheltered by the South Down range. Our readers will remember that here Harrison Ainsworth lays the plot of his Royalist novel, "Ovingdean Grange." The parish church was restored and reseated about twenty-one years ago.

**Borough Surveyorship, Brighton.**—We hear that Mr. G. R. Andrews has been appointed Borough Surveyor of Brighton, at a salary of 500*l.* per annum. Mr. Andrews has been for the last ten years Town Surveyor at Bournemouth, under the Improvement Commissioners. He has done a great deal of good work in this rising health-resort, and we congratulate him upon his new appointment.





LONDON.—For alterations and additions to Nos. 300 and 302, Oxford-street, W., for Messrs. Helbroner, Limited. Mr. Albert E. Pridmore, architect, 2, Broad-street-building, E.C. :—  
 Taylor & Co. £1,950 0 0  
 Hollingsworth 1,927 0 0  
 McCormick 1,525 0 0  
 Kilby & Gayford 1,907 0 0  
 R. Julian 868 0 0

LONDON.—For alterations at the Essex Arms, High-street, Aldgate, for Mr. Matchard. Mr. Geo. Treacher, architect, 30, Coleman-street, E.C. :—  
 Caden 2,385 0 0  
 J. Beale, Westminster-bridge-road 330 0 0  
 Smith & Appleton 318 0 0  
 \* Accepted.

LONDON.—For alterations, repairs, and additions to No. 74, Lancaster-gate, W. Mr. W. Jacob Gibson, architect, 36, Great James-street, Bedford-row, W.C. :—  
 W. B. Head & Son 2,549 0 0  
 Macfarlane Bros. 544 0 0  
 H. J. Chapman 533 0 0  
 E. L. Nunn (accepted) 516 0 0

LONDON.—For alterations, repairs, and bar fittings to "The Bickleigh" public-house, Vestry-road, Camberwell, for Mr. J. Lowry. Mr. John Reynolds, architect, 35, Camberwell-green, S.E. :—  
 Parker £1,649 0 0  
 Redmill 1,345 0 0  
 Drew & Godman 1,327 0 0  
 J. & H. Cocks 1,327 0 0

LONDON.—For clearing the site and building a new Baptist Chapel in Cecil-street, Oxford-street, London. Mr. Owen Lewis, architect, 79, Mornington-road, Regent's Park, N.W. :—  
 John Allen & Sons £3,955 0 0  
 Geo. Fosley 3,900 0 0  
 EH Tison (accepted) 3,800 0 0

LONDON.—For the erection of new premises at 69, Westow-hill, Upper Norwood, for Messrs. Simmons & Sons. Mr. H. W. Pratt, architect. No quantities supplied :—  
 Bowyer & Son, Upper Norwood £1,012 0 0  
 G. Jarvis Smith, Streatham 974 0 0  
 Triggs, Clapham (accepted) 947 0 0

LONDON.—For alterations and additions to 74, Upper-street, Islington, N., for Messrs. Fencott, Evans, & Co. :—  
 T. Andrew £1,079 0 0  
 L. H. & R. Roberts 1,043 0 0  
 Wootner Smith & Co 678 0 0  
 Brown & Harris (accepted) 954 0 0

LONDON.—For excavating for and forming concrete foundations for a group of industrial dwellings, to be erected in Brady's rect, Whitechapel. Messrs. N. S. Joseph & Smith, architects, 46, Finsbury-pavement :—  
 Catermole & Son £2,465 0 0  
 Goodman 2,106 10 0  
 Fortescue 1,999 0 0

LONDON.—For alterations and extension of schools in rear of Hampden Chapel, Lauriston-road, Hackney. Mr. Robt. Burr, architect, 2, Gt. George-place, Chelsea :—  
 F. G. Higgs £287 0 0  
 Cox 870 0 0  
 G. W. Beale (accepted) 849 0 0

LONDON.—For sanitary and decorative repairs and additions at 36, Glatton-road, The Boltons, South Kensington, S.W. Mr. John Jackson Wheeler, surveyor, 158, Fulham-road S.W. :—  
 J. Jones, Chelsea £338 0 0  
 Scharies & Co., Chelsea 321 0 0  
 W. Park, Chelsea 286 10 0  
 Bovis & Co., New-street, Dorset-sq. 253 0 0  
 \* Accepted.

LONDON.—For alterations and additions to 3, Crosby-square, Bishopsgate. Messrs. N. S. Joseph & Smith, architects, 46, Finsbury-pavement :—  
 Colls & Sons £3,660 0 0  
 G. S. Williams & Son 3,115 0 0  
 Ashby Bros. 2,855 0 0

LONDON.—For alterations to the "Queen's Head," Strand for Mr. P. Anstie. Mr. E. E. Niblett, architect, Hackney, E. :—  
 Contract No. 1.  
 Wilkinson Bros. (accepted) 278 0 0  
 Contract No. 2.  
 J. Anley (accepted) 282 10 0

LONDON.—For additional story at No. 156, North End-road, Fulham. Mr. Robt. Burr, architect, 2, Gt. George-place, Chelsea :—  
 Walls & Son, Red Lion-street (accepted) £225 0 0

MANCHESTER.—For alterations to house, and additions of billiard-room and terraces, for Mr. Hugh Rowland. Messrs. E. & F. Hewitt, architects, 9, Albert-square, Manchester. Quantities by architects :—  
 Simon Johnson 2,668 0 0  
 Wm. Brown & Son 697 0 0  
 R. Neill & Sons 693 0 0  
 Wilson, Toff, & Huntley 628 0 0  
 Owen Williams (accepted) 597 0 0  
 William Shaw 589 0 0

READING.—For small detached house at Caversham. Mr. Henry Gough, architect, Station-road, West Croydon :—  
 G. Wernham, Reading £233 10 0  
 Simonds, Reading 330 0 0  
 W. Hawtin, Reading 315 0 0  
 W. Goodchild, Reading 245 0 0  
 Batley & Lincolt, Croydon 236 0 0

WATFORD (Herts).—For the erection of new bottling stores at 95, High-street, for Messrs. Durand, Sedgwick, & Burd, of Bedford-street, W.C. Mr. C. P. Ayres, architect, 62, High-street, Watford :—  
 Andrews & Sons £270 0 0  
 C. Brightman 669 0 0  
 W. B. Neal 652 0 0  
 G. & J. Waterman 637 0 0  
 T. Turner, Limited 625 0 0  
 H. M. Dove (accepted) 597 10 0  
 [All of Watford.]

WIMBLEDON.—For building new house at Raynes Park, Wimbledon, for Mr. Fred. E. Weatherley. Mr. Geo. Sherrin, architect :—  
 J. Chapman, Hackney £1,705 0 0  
 [No competition.]

WORKING.—For new house at Mount Hermon, Woking. Mr. W. L. Chambers, architect :—  
 Geo. Gray, Egham £1,458 0 0  
 A. A. Gale, Woking 1,343 0 0  
 Martin, Wells, & Co., Aldershot 1,150 0 0  
 John F. Lee, Ripley 1,060 0 0  
 Edgar Seaver, Godalming 950 0 0  
 Chas. Ham, Woking (too late).

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## HOWARD & SONS

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# The Builder.

VOL. LVI. No. 2404.

SATURDAY, MARCH 2, 1889.

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### The "Encyclopédie de l'Architecture."

WHEN we say that the two first volumes of the new French Encyclopédie de l'Architecture\* comprise nearly 900 double-column pages, and that the end of Volume II. gets us as far as the commencement of the "Béton," it will be at once apparent that this is a work of no ordinary scale and importance. As far as it has at present gone, it appears to be to treat of all important subjects connected with design and construction in architecture, to give a historical review of the architecture of the principal nations of the world, special descriptions and illustrations of important buildings, and biographical notices of the life and work of the most eminent architects of various periods. These biographical articles, however, kept very short, more after the manner of the short notices in the English Dictionary of Architecture." In other respects the aim seems to be to treat the principal subjects with something like the degree of fulness and elaboration shown in Viollet-le-Duc's great work; and as that is confined to Mediaeval architecture, it is obvious that an attempt to carry anything like the same scale of critical explanatory treatment for the architecture of the whole world and of all times, besides including all the various forms of construction considered on their scientific side, represents a task of which it is difficult to foresee the end or limit. In one respect it is at once evident that the comparison with Viollet-le-Duc's work cannot be sustained,—namely, in illustrations. These are very numerous, very useful, and occasionally quite adequate in style and execution to the importance of the occasion; and, of course, in the case of the smaller cuts, even of architectural details properly so called, a simple line drawing is sufficient for the purpose; but many of the perspective sketches of buildings, line-drawings reproduced by zincograph or some analogous process, are in a hard, scratchy manner, without tone or effect, and would not be accepted in the present day by any English

architect as adequate representations to accompany an important architectural work. We regret to find that among the very worst of these are many of the illustrations of English buildings.

As every one would expect in an encyclopædia conducted by M. Planat, practical subjects receive very full consideration. The article "Acier," for instance, deals at considerable length with the composition and properties of steel, and gives sectional illustrations of the Bessemer and Siemens converting furnaces, and descriptions of their method of action. "Acoustique," which follows, is also very carefully prepared, and gives a number of illustrations of various machines which have been used to analyse and obtain diagrams or other visible illustrations of the action and mechanism of sound. The special application of the subject to the acoustics of buildings is reserved for a future article on "Salles d'audition." The article "Assemblage," which is used in French for the joining of the parts in carpentry and iron construction, treats at considerable length of this problem, with a sufficiency of small diagrams of joints and fishings in woodwork and connections in ironwork. The article on "Adjudication," and one or two others on questions which enter into the province generally distinguished in England as "professional practice," are, of course, more especially interesting to French readers, as such subjects are naturally treated in accordance with French practice.

The article "Architecture" comes within the first volume, and we are naturally curious to see how this central subject of the whole is treated in an architectural dictionary. The subject runs through nearly 250 pages, under the sub-headings "Civile et Domestique," "Funéraire," "Militaire," "Privée," and "Religieuse," in the order here named,—which strikes one as oddly assorted at first, but which is evidently arranged on alphabetical consideration only; "Religieuse" occupying by far the larger proportion of space. The philosophical consideration of the art of architecture itself, its principles, its objects, its capabilities and limits, ought, one would have thought, to be considered as a separate subject before coming to subsections. This view of the subject is not entirely overlooked, but it is only glanced at in a few prefatory remarks at the commencement of the "Civile et Domestique" section, and dismissed with the remark that civil and domestic architecture only belongs to peoples in an advanced state of civilisation, and therefore

has passed beyond the subject of primary origin. A general consideration of the origin of religious architecture is prefixed to the chapter on that subject, but only deals in general reflections with no very decisive conclusions, and the article (which is signed by M. Planat) then becomes historic. We should certainly have considered that in a dictionary of this kind there should have been an article, as concentrated as might be, for the reader who might (not unreasonably) look to the work for an answer to the question, "What is architecture?" Otherwise, the treatment of the different sections of the subject is very well carried out, except that "Architecture Privée," certainly a very important branch of the subject, is dismissed in a short article of three pages by M. Paul Sédille, with no illustrations at all. It may be replied that the subject can be treated in detail under "Maison," as one section of it is treated in the present volumes under "Appartement"; but then the same thing might be said of "Eglise," under which heading much of what is contained under "Architecture Religieuse" might have come. There is a sense of disproportion in seeing one subject treated at great length in a dictionary, and another dismissed briefly; it looks as if there were not a strong enough hand over the contributors, and as if each were doing what was right in his own eyes; and it is impossible to make a perfectly homogeneous and logical dictionary on that footing. There are other evidences of the same want of central control or sense of proportion. "Architecture Autrichienne" occupies ninety-seven pages; "Architecture Anglaise" only twenty-three,—an absurd disproportion. The article on "Architecture Religieuse" gives a remarkable résumé of the history of the subject, with plans and sketches of the typical temples and churches of every era, from the earliest known Egyptian examples, and includes a sketch of the recent information that has been brought to bear on Persian religious architecture by the researches of M. and Madame Dieulafoy. Greek temple architecture is ably treated of in regard to the literary portion of the article, but is very inadequately illustrated; the restored view of the Parthenon is such a poor affair that it would have been more to the credit of the book to omit it. Roman temple architecture receives much better treatment in this respect; it is, of course, much easier to illustrate, not requiring the refinement in drawing which Greek architecture demands. As a general rule, how-

\* Encyclopédie de l'Architecture et de la Construction. Directeur, P. Planat, Paris: Dejean et Cie.



ever, the illustrations of this, as of some other articles, go to show that it is better in an architectural work of this kind, where illustrations must be numerous and mostly small, to avoid views as much as possible, and to confine the illustrations to geometrical drawings, which do not require the same finish of execution as a perspective view must have if it is to be worth having. A section and an elevation profess to give us the actual facts of the building; a perspective view professes to give its impression and effect as it appeared, and we want something more than mere correctness in this,—something of artistic effect, unless (which in some respects would, perhaps, be preferable for this kind of work) the view were confined to a carefully-drawn outline. In general, an encyclopedia of this kind is chiefly used by students of architecture who understand and chiefly require sections, plans, and elevations; such readers do not want pretty pictures, and at the same time they are of all others the most likely to be annoyed by bad ones. Among the perspective illustrations of later (Medieval) buildings are some better drawings, as the views of Lincoln, Cologne, and Burgos, though they are all rather hard and wiry in style,—to English eyes, at all events. St. Paul's, we observe, is not honoured with any illustration in this chapter, though St. Geneviève and St. Sulpice, and others of the Renaissance churches of Paris, are duly promenade.

The article on "Architecture Anglaise" is very badly done, and full of absurdities. The editor appears to have put it into the hands of an architect nominally English, but with an entirely French education and French ideas, apparently on the ground that he could write about English architecture in the French language. M. Planat would have done far better for his book if he had got the article written by an Englishman thoroughly conversant with the subject, and then had it translated. The most provoking part of it is that the writer persists in identifying himself with England, speaking of "nous" always, and referring to "mes compatriotes," leading foreign readers to suppose that he is expressing English opinions and conclusions. He has discovered that Wren was incapable of designing anything himself, and that all the good things in his works were done by French architects in his employ. He admits he has no documentary evidence of this, but Wren "nous a laissé une foule des documents en pierre que tout architecte qui sait son métier peut facilement interpréter." How far the author of the article is up to date in his study of Gothic architecture may be inferred from the fact that the details of English Gothic, the development of window tracery, and other things, are illustrated only by copies of the old diagrams in Gwilt, which are all produced here as adequate illustrations of English Gothic; drawings which were made at the time when Gothic was just beginning to be studied in modern England. Gothic ornament is illustrated by a cap from Westminster Abbey and a Perpendicular base and capital from Howden, the hard cast-iron drawing of which has been familiar in all the editions of Gwilt for half a century. The article seems, indeed, to have been mainly got up from Gwilt's venerable historical sketch. Moreton Old Hall and a good many other cuts are copied or photographed from it. Wollaton Hall is illustrated by what is apparently a clumsy outline tracing from a poor engraving in Gwilt, turned in the reverse direction to the original. The writer has got hold of a theory that the square end of the English chancel resulted from the difficulty the English builders experienced in constructing stone vaults, which led them to employ open-timber roofs which could not be so conveniently fitted on to a *chevet* termination; and gives as an instance Westminster Hall! It does not seem to have occurred to him to consider what was the date of Westminster Hall roof; or how much vaulting had been built in England before that; or that Westminster Hall was a very different thing from a three-aisled church; or that when one portion of an

English church is vaulted and another portion not, it is always the nave that has the timber roof, and the choir the vault. The writer's capabilities for treating of English Gothic architecture may be further estimated from others of his illustrations. The only Medieval church of which a decent illustration is given is the west end of the interesting but not very important church of Edington. A Medieval tower is illustrated by a vilely-drawn elevation of All Saints, Derby, which has the appearance of having been enlarged from the small (and very bad) engraving in Gwilt by a French draughtsman who knew nothing of Gothic, and so filled in the detail at his own sweet will. Modern English Gothic is illustrated by St. Mary's Cathedral, Edinburgh, notoriously one of the least successful of Scott's works. None of Street's churches are referred to, though his name is mentioned; and of Mr. Butterfield and the fame of his churches the writer apparently knows nothing. The name of Mr. Waterhouse, who has certainly played as large a part in modern English architecture as most people, is not mentioned; and a scratchy drawing of the upper part of a "Maison d'une Compagnie des Assurances" appears to be an attempt to make a drawing of part of Mr. Norman Shaw's building at the bottom of St. James's-street, conveying no idea whatever of its real effect. We learn that "en France architecture grecque, entre les mains de Labrousse, Duc, et Duban, a été féconde en effets heureux, mais en Angleterre, entre les mains des amateurs ignorants, elle enfanta le gâchis"; a statement little short of impudent. The most important and remarkable building of the Greek revival, St. George's Hall, of which the writer does not seem to have heard, was the work of an English architect, Elmes, of whom also the writer has not heard. St. George's Hall is not illustrated, but St. Pancras Church is, to show the absurdity of English Classical work. We may as well inform French readers that few buildings have been more ridiculed in England than this one. One or two of the buildings erected by Cockerell (who is called "Cokerell") for the Branch Banks of England might also have shown French readers that refinement and originality in the application of Classic types to modern purposes were qualities not quite without illustration on this side of the Channel. We can hardly expect this, however, when we find that St. Paul's is considered sufficiently illustrated (?) by a wretched little line diagram, without the slightest attempt at effect, and looking as if it was drawn with a kitchen fork. English readers will hardly recognise "Dean Collett" or "Sir Thomas Morus" as personages in English history, any more than they will accept the poverty-stricken design of a "Maison dans Sundridge Park" (sic) as a typical example of modern English villa architecture of the "Queen Anne" type. The best thing M. Planat can do is to cut this article out of his next edition, and get an article on English architecture written by a competent English architect, who knows something about the subject, and knows where to go for adequate illustrations of it.

The article on German architecture, "Allemande," not by any means full enough if we are to consider it in comparison with that on Austrian architecture, is, at all events, much better illustrated than that on English architecture. The illustrations are exceedingly interesting in one sense, that they represent a number of curious, picturesque, out-of-the-way examples of the whims that Renaissance architecture took on German soil, and to illustrate these appears to be the main object of the article. It has given us a number of interesting illustrations; but that is not the way to treat such a subject in an Encyclopedia. What is wanted is a logical and connected study of the development of the architecture of the country, not a collection of

interesting examples put in without select or order. The article is much more connected and logical than the illustrations; commences with remarks on the Romanesque and Gothic of Germany, and the main facts of their development, but not an illustration is given of this portion of the subject. In the Romanesque of Germany forms one of the most interesting chapters of architectural history, and includes buildings of a grand and noble though simple style, better worth illustrating, and occupying much more important place in architectural history, than the *rococo* eccentricities of German Renaissance. The conclusion suggested by the article is that it is written by some one who has a taste for German *rococo* and who happens to have a good many illustrations of that type of work on hand, by the course of the article is governed by the materials available, and by special tastes of the writer. Nothing that is exactly what it is desirable to avoid in a book of this class. An encyclopedia is not the place for the setting forth of doctrinaire theories, or of personal likings and dislikes; the object should be to give each subject an unbiased *résumé* of what is known on the subject in a condensed and concentrated manner, and with special attention to logical and well-balanced arrangement; and to attain this end it is absolutely necessary that the editor of such a work should have his eye over the whole, and control the individual tendencies of contributors. This has evidently not been sufficiently the case in the "Encyclopédie de l'Architecture" so far, and the consequence is that some articles, or some portions of articles, run on to undue length in accordance with the inclinations or special knowledge of the writer, while others, equally important, are passed over in a cursory manner.

Subjects such as "abside" and "abbaye" appear to be well treated; and if the history and architecture of French châteaux is tended to be treated and illustrated to some extent as those of "Azy le Rideau" "Amboise" in the present volumes, the compendium will be a valuable book of reference in regard to French châteaux; but this, again, is unduly emphasizing a special subject. It may fairly be questioned whether such articles as those on "Architecture Religieuse" and "Architecture Autrichienne" (for example) are not going beyond the limits of what is necessary and convenient in an encyclopedia. No one who is seriously studying the history of temple and church architecture would content himself with an encyclopedia article, or even think it worth while to look at one; the object of an encyclopedia is to give a *résumé* or outline of a subject for immediate reference; a treatise on the subject is more than is wanted for reference, and less than would content a student. And every unnecessarily long article adds to the difficulty of bringing work to completion. The world is strewn to speak, with the wrecks of dictionaries and encyclopedias which have remained incomplete in consequence of having been started on too extended and ambitious a scale. We wish that the "Encyclopédie de l'Architecture" should not add another to the number.

#### THE REVISED RAILWAY RATES

THE new classifications and schedules of rates required by the Railways and Canal Traffic Act have now been deposited with the Board of Trade. The lack of uniformity, upon which we briefly commented a fortnight ago (p. 120, *ante*), renders the study of these somewhat formidable matter, especially the proposed charges include a double set of "terminals" at each end, in addition to maximum per mile for conveyance. There are certainly not such a number of different rates introduced as there would have been had the existing authorised charges for the separate sections been maintained, companies having in many instances ag-

\* We seem to remember this as a design once offered to us for publication, and declined. It is a mere piece of estate agents' architecture, and to publish it as an example of modern English house architecture is a libel on the English profession.



upon a scale applicable to all,—or nearly all,—the different portions of their system.

With regard to the classification, ordinary merchandise is still divided into five classes, and heavy traffic into three,—the latter to be henceforward denominated A, B, and C. Each of these latter classes is subject to "station" terminals, but only Class C,—which corresponds to the present "special class,"—to "service" terminals in addition. Appended to the classification are a number of general conditions, upon which (as well as upon the classification proper) the companies are practically in accord. Some of these conditions first appeared in the abandoned Bills introduced by the railway companies in 1885. Among these we may quote at length a few important clauses:—

"Special Charges.—The company may charge such reasonable amounts as, in case of difference, shall be determined by the Railway Commissioners in respect of the following matters:—

A.—Accommodation provided by the company at or in connexion with sidings not belonging to the company, and the delivery or reception of traffic to or from such sidings.

B.—The collection or delivery of merchandise.

C.—The use of trucks, or the use or occupation of any accommodation included in the station terminal, beyond such period before or after conveyance as shall be reasonably necessary for enabling the company to deal with merchandise as carriers thereof, and the services rendered in connexion with such use or occupation."

It will thus be seen that there may be a variety of extras to be considered beyond the charges covered by the authorised maximum rates. Another regulation which comes from the 1885 Bills is the following:—

"For a fraction of a ton in respect of consignments exceeding 560 lbs. in weight, the company may charge according to the number of quarters of a ton in that fraction, and a fraction of a quarter of a ton shall be deemed a quarter of a ton." This rule, giving no qualification or exception, cannot really be justifiable. The effect would seem to be that anything weighing just over half a ton is liable to be treated as weighing half a ton, and this, (especially in the case of an article placed in one of the higher classes) would increase the charge to an unreasonable extent. This proposal is one which should be objected to.

With regard to "small," too, the powers the companies should be more clearly defined. This is a matter upon which they could easily be in agreement, but the proposals vary considerably. Many of them opt the following very elastic and convenient rule:—"For small parcels not exceeding 560 lbs. in weight the charge shall be the reasonable sum as the company may think fit." This leaves room for endless variation, although a scale, similar to that at present in force, will probably be eventually adopted by all. It will be noticed that the rate of weight for smalls is raised from 10 lbs. to 560 lbs. There is this fact to be considered all through,—that the companies, being themselves bound to provide against possible contingencies, ask for wider powers in their really desire to exercise under the prevailing state of affairs; and, practically, the rule of "what the company may think fit" modified by the maximum rates and the quoted rule of "what the traffic will bear," will always control rates to a very great extent.

A comparison of the new classifications with those of 1885 reveals the fact that several articles are now placed in higher classes. "Empties,"—which railway people, with aversion,—are actually placed in the fifth class. In 1885 they were in class B, while, practically, they are not dealt with as being classified at all,—except in the case of new empties,—being subject to special regulations. This is a remarkable contrast to the old rule of "free returns," though, under the present scale (which has advanced step by step), empties are still looked upon as un-

| NAME OF RAILWAY COMPANY.        | CLASS.                                                                                                                        | Proposed Maximum Rates for Conveyance (at per ton per mile). |                                                     |                                                     |                                    | Proposed Station Terminal at each end. |                       | Proposed Service Terminal at each end. |                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|------------------------------------|----------------------------------------|-----------------------|----------------------------------------|-----------------------|
|                                 |                                                                                                                               | For the first 10 miles or any part of such distance.         | For the next 10 miles or any part of such distance. | For the next 20 miles or any part of such distance. | For the remainder of the distance. | At large towns as defined.             | At any other station. | At large towns as defined.             | At any other station. |
| London and North Western        | A                                                                                                                             | d.                                                           | d.                                                  | d.                                                  | d.                                 | s. d.                                  | per ton.              | s. d.                                  | per ton.              |
|                                 | B                                                                                                                             | 1                                                            | 1½                                                  | 1½                                                  | 1                                  | 0 8                                    | 0 6                   | —                                      | —                     |
|                                 | C                                                                                                                             | 2½                                                           | 2                                                   | 1½                                                  | 1½                                 | 1 0                                    | 0 9                   | —                                      | —                     |
|                                 | In the case of this Company, the first column is for "the first 20 miles," and there are exceptions to the scale for Class A. | 1                                                            | 3½                                                  | 2½                                                  | 2                                  | 1 3                                    | 1 0                   | 0 9                                    | 0 6                   |
|                                 | 1                                                                                                                             | 3                                                            | 2½                                                  | 2                                                   | 1½                                 | 2 0                                    | 1 6                   | 1 6                                    | 1 0                   |
|                                 | 2                                                                                                                             | 3½                                                           | 2½                                                  | 2½                                                  | 2                                  | 2 0                                    | 1 6                   | 1 9                                    | 1 3                   |
|                                 | 3                                                                                                                             | 3½                                                           | 3½                                                  | 3                                                   | 2½                                 | 2 0                                    | 1 6                   | 2 0                                    | 1 6                   |
|                                 | 4                                                                                                                             | 4                                                            | 3½                                                  | 3½                                                  | 3                                  | 2 0                                    | 1 6                   | 2 9                                    | 2 0                   |
|                                 | 5                                                                                                                             | 5                                                            | 4½                                                  | 4                                                   | 3½                                 | 2 0                                    | 1 6                   | 3 6                                    | 2 6                   |
|                                 |                                                                                                                               |                                                              |                                                     |                                                     |                                    |                                        |                       |                                        |                       |
| Great Western                   | A                                                                                                                             | 1½                                                           | 1½                                                  | 1½                                                  | 1½                                 | 0 8                                    | 0 6                   | —                                      | —                     |
|                                 | B                                                                                                                             | 2                                                            | 1½                                                  | 1                                                   | 1                                  | 0 8                                    | 0 6                   | —                                      | —                     |
|                                 | C                                                                                                                             | 2½                                                           | 2                                                   | 1½                                                  | 1½                                 | 1 3                                    | 1 0                   | 0 9                                    | 0 6                   |
|                                 | 1                                                                                                                             | 3                                                            | 2½                                                  | 2                                                   | 1½                                 | 2 0                                    | 1 6                   | 1 6                                    | 1 0                   |
|                                 | 2                                                                                                                             | 3½                                                           | 3                                                   | 2½                                                  | 2                                  | 2 0                                    | 1 6                   | 1 9                                    | 1 3                   |
|                                 | 3                                                                                                                             | 4                                                            | 3½                                                  | 3                                                   | 2½                                 | 2 0                                    | 1 6                   | 2 0                                    | 1 6                   |
|                                 | 4                                                                                                                             | 4½                                                           | 4                                                   | 3½                                                  | 3                                  | 2 0                                    | 1 6                   | 2 9                                    | 2 0                   |
|                                 | 5                                                                                                                             | 5                                                            | 4½                                                  | 4                                                   | 3½                                 | 2 0                                    | 1 6                   | 3 6                                    | 2 6                   |
|                                 |                                                                                                                               |                                                              |                                                     |                                                     |                                    |                                        |                       |                                        |                       |
|                                 |                                                                                                                               |                                                              |                                                     |                                                     |                                    |                                        |                       |                                        |                       |
| London Brighton and South Coast | A                                                                                                                             | 2                                                            | 1½                                                  | —                                                   | 1                                  | 0 8                                    | 0 6                   | —                                      | —                     |
|                                 | B                                                                                                                             | 2                                                            | 1½                                                  | —                                                   | 1½                                 | 0 8                                    | 0 6                   | —                                      | —                     |
|                                 | C                                                                                                                             | 2½                                                           | 2                                                   | —                                                   | 1½                                 | 1 3                                    | 1 0                   | 0 9                                    | 0 6                   |
|                                 | 1                                                                                                                             | 3                                                            | 2½                                                  | —                                                   | 2                                  | 2 0                                    | 1 6                   | 1 6                                    | 1 0                   |
|                                 | 2                                                                                                                             | 3½                                                           | 3                                                   | —                                                   | 2½                                 | 2 0                                    | 1 6                   | 1 9                                    | 1 3                   |
|                                 | 3                                                                                                                             | 4                                                            | 3½                                                  | —                                                   | 3                                  | 2 0                                    | 1 6                   | 2 0                                    | 1 6                   |
|                                 | 4                                                                                                                             | 4½                                                           | 4½                                                  | —                                                   | 4                                  | 2 0                                    | 1 6                   | 2 9                                    | 2 0                   |
|                                 | 5                                                                                                                             | 5                                                            | 5                                                   | —                                                   | 4½                                 | 2 0                                    | 1 6                   | 3 6                                    | 2 6                   |
|                                 |                                                                                                                               |                                                              |                                                     |                                                     |                                    |                                        |                       |                                        |                       |
|                                 |                                                                                                                               |                                                              |                                                     |                                                     |                                    |                                        |                       |                                        |                       |

profitable and undesirable traffic. Of course, the existing regulations may still be retained in practice; but if allowed to remain in the highest class, there will be plenty of margin in reserve for the upward tendency to be continued. Light castings in boxes, &c., are advanced a class, so is twine and hemp, and several other articles are "moved up" in the same objectionable manner. Copies of the classifications may be obtained from any station-master for a shilling, and traders will be able to see for themselves how the particular merchandise in which they are interested is classified; but, the rates per mile varying, a few specimen rates are appended.

The effect of the addition of "station" and "service" terminals to the rates for conveyance will be readily understood by a reference to the subjoined table. We may first give the definitions of the two charges as they appear in the "general conditions" agreed to by all the companies; together with a list of the "large towns" mentioned by the principal English companies.

"Maximum station terminals include the charge for accommodation (exclusive of coal drops) at terminal stations provided by the company for dealing with merchandise as carriers thereof, before or after conveyance, together with the following services and expenses, viz., share of general charges and office expenses attributable to such services as are rendered by the company to all descriptions of merchandise alike, in performing the duties incidental to the duties of a carrier, shunting and marshalling of trucks, and the provision of engines, horses, machinery, plant, and stores used in the services referred to in this sub-section.

Maximum service terminals include the charges for the following services rendered by the company in dealing with merchandise as carriers thereof, before or after conveyance, viz., the labour of servants of the company in loading and unloading, covering and uncovering merchandise, the provision of machinery, plant, sheets, and stores used in such services, and also the share of general charges and office expenses especially attributable to the classes of merchandise in respect of which service terminals are authorised."

The large towns are London, Liverpool (including Bootle), Manchester (including Salford), and Birmingham; while the Manchester, Sheffield, and Lincolnshire add Ashton-under-Lyne, Oldham, Barnsley, Sheffield, Rotherham, Hull, and Grimsby. It is provided that other places may from time to

time be added by the authority of Parliament.

Above we give a typical list of the proposed maximum charges. It will be noticed that the suggestion thrown out by the Board of Trade as to separate rates for truck and train loads has not been adopted, but the companies will doubtless make special agreements for exceptional quantities of traffic, as heretofore. They would, however, have been less liable to incur charges of undue preference, by submitting a lower scale for such exceptional consignments.

#### NOTES.

THE suggestion made by Mr. Somers Clarke at the Society of Antiquaries' meeting, on Thursday evening, February 21st, in regard to the proposed addition to Westminster Abbey, is certainly worth consideration. Mr. Clarke argues that the position to the south-east of the Abbey is the best one, provided that the new building were a much smaller one than that already suggested, placed east and west, and kept clear of the Little Cloister and the other remains of Mediaeval work. The great objection to the addition as proposed is its preposterous size and the utterly unarchitectural manner in which it is proposed (so far) to join it on to the ancient buildings. We see no decided objection to the addition of a smaller-sized chapel in the place proposed by Mr. Clarke, provided it can be connected with the Abbey in such a manner as not to injure the architectural effect of the latter, and (which is still more important) provided it is carried out in a manner worthy of the position architecturally; and we may warn those who wish to support the project that it will cost more to do that than most of them have probably estimated. Mr. Shaw-Lefevre asserted at the meeting that he had been assisted in his scheme by Mr. Pearson. Are we to understand that Mr. Pearson is responsible for the planning of the connexion of the new building with the Abbey, as shown on the plan published in the *Nineteenth Century*? If not, it would be to the credit of English architecture that he should deny having had any hand in such a piece of bungling.

\* We take the opportunity of correcting a slip of the pen in the leading article of last week (page 138, second column)—"a narrow aisle winding under the flying buttresses of the nave"; it should, of course, have been "of the Chapter-house."



THE site of the Sanctuary of Aphrodite Pandemos at Athens has long been a matter of dispute. An inscription, the discovery of which is reported in the last number of the Athenian *Δελφικος*, though it does not settle the question, affords important evidence. The inscription records certain measures relating to the ritual and general expenditure of a sanctuary which is twice distinctly named as that of Aphrodite Pandemos. It was brought to light in pulling down the Turkish wall which intervened between the temple of Niké Apteros and the south tower of Beule's gate. Of course, an inscription can be dragged about anywhere; but as there are other substantial reasons for supposing that the sanctuary was close to the Propylæa, the discovery of the inscription certainly tells in that direction. Dr. Köhler and others have tried hard to place the sanctuary close to the Asklepieion; but the fact that the heron of *Ægeus must* have been just under the Niké Apteros, where tradition says he threw himself down and died, is a strong presumption that the Aphrodite worship, so closely linked with the whole Troezenian tradition, was close at hand. The fixing of the site is of great importance, as with it goes, according to Pausanias, the shrine of Ge Kourtophros and Demeter Chloe. Before the whole wall in question is pulled down we may hope for a good deal more of this sort of topographical evidence. The inscription is on a slab of Hymettian marble, adorned with a decorative pediment, and, according to Dr. Lölling, dates (by the archonship of Euthikos) at 283 A.C.

IN *L'Architecture* for February 23, M. Loviot replies to the anti-polychromatic views of M. Pottier, alluded to in our last (p. 141, ante). M. Loviot asserts that when he was measuring the Temple of Jupiter Panhellénus at Egina he saw large fragments of stucco coloured red on the floor of the cella, some of them still adhering to the pavement. From the cella floor to the steps of the temple, he argues, is not far; why should there not have been coloured stucco on the steps? He confesses that, supported by this evidence, he would, in any restoration of the Parthenon, paint not only the columns but the steps. "If," he says, "there is not historic argument in favour of the polychromy I have adopted, there is none against it." This seems an exceedingly dangerous line of reasoning; and the continuation of M. Loviot's remarks is in the same style of logic: Polychromatic decoration is beautiful, therefore it must have been employed everywhere by the Greeks, who, besides, were under the necessity of employing it everywhere to hide the excessive whiteness of Pentelic marble, which was injurious to the eyes. It has often been argued that since the Pentelic was given the preference, it was on account of its whiteness. M. Loviot goes on to say that while the archaeologist is occupied in accurately reading the sense of inscriptions to get at their meaning, the architect is guided "par le sentiment personnel," and by probabilities. "S'il arrive que le sentiment et les probabilités s'accordent, tout est pour le mieux, car, avec un compas et un pinceau, il faut de la décision. On ne dessine pas des doutes, on ne colore pas des hypothèses. J'ai pris le parti de faire ce que je crois être le plus beau, le plus conforme au génie grec." That is admirable, no doubt, but it is not archaeology.

THE same number of *L'Architecture* from which the last citation is made includes several records in detail of French cases of party-wall disputes, and the judgments on them, which may be of interest to those who are specially concerned with questions of building-law.

AT the instance of the Belgian Minister of Public Works, M. D'Hauw, a chemist attached to the University at Ghent has been experimenting upon the combustibility of ordinary as well as chemically-prepared wood, the results of which are stated as follows:—When raw wood in its natural state has for half-an-

hour been heated under a temperature of 300 deg. C., it becomes completely free from all moisture, assumes an amber colour, whilst its bearing-strength is greatly decreased. At a temperature of 300 deg. C. the wood assumes the character of charcoal, and the bearing-strength is nearly nil. However, the structural features of the wood are in either case but little affected. But when the temperature is increased to red-hot point the wood was rapidly consumed, flames breaking out on all sides, and the fire continued until ashes alone remain. Wood, on the other hand, coated with some fire-proof material, as, for instance, asbestos, undergoes no structural change under a temperature of 200 deg. C., although the colour becomes brown and the bearing-strength lessened. If wood be steeped in certain chemicals,—as, for instance, phosphate of ammonia, which is much used for impregnation,—the results under the same circumstances are different, the wood assuming a deep brown colour, whilst the bearing-strength is still more reduced. If heated to a still higher temperature, chemically-prepared wood will be consumed like the natural wood, but much more slowly. We give this information (from a German paper) as being of some interest, but of course cannot be responsible for the correctness of the conclusions arrived at.

AT the Goupil Gallery there is at present a small but interesting collection of the works of Corot, including some paintings in his finest style. Among these, perhaps the best is the "Danse des Nymphes" (3), a large landscape, framed in by masses of trees on either hand, as Corot liked to do, with four figures dancing on a green knoll a little way from the foreground, relieved against an evening sky; a soft, hazy distance of undulating country is beautifully indicated behind the ridge. Perhaps a still more complete work, of the same stamp, is the smaller one, "Joueur de Flûte" (1), also an evening landscape seen through trees, with a figure, very unobtrusively introduced, seated and playing the flute; just sufficiently seen to give a human element to the scene. This picture is an example of the pure imaginative poetry of landscape painting; not a mere representation of nature, but a scene expressing a mood or sentiment of the mind. The "Lac de Garde" (2) is equally so, but an entire contrast to the last-named; a silvery spring scene by the side of a lake, the water of which is "invisible with calmness," and only indicated by the reflection of the landscape upon it. It is interesting to learn from the preface to the catalogue that when Corot came to his studio in the morning he examined the unfinished pictures till he came to one that harmonised with his feelings that day. "If he felt gay and happy, he would choose a scene in spring, and he would revel with his brush in a field of flowers, a smiling river, with the willows and reeds moving in the breeze. At other times he inclined to the severely-classical landscape, grave and grand, full of sobriety and dignity." This is quite borne out by his pictures. They each represent a phase of feeling expressed through landscape, and are always either distinctly light and gay or distinctly pensive. Among the smaller works of the bright mood, an exquisite one is "La Vanne" (16),—a meadow, with trees in the middle distance, and a sluiceway built up in masonry in the foreground, the solidity of which, and its dark shadow on the grass, are of immense value in giving aerial lightness to the rest of the scene. "L'Arbre Brisé" (10) is unusual in its composition for Corot; a common, a pond, and a cottage, with a dark mass of trees on the left; but the materials of the scene, though prosaic in themselves, are floated off into a semi-ideal haziness, very different from the realistic representation of a common and a cottage. The collection contains what is certainly seldom seen, a nude figure by Corot, seated in front of a group of trees, in the picture entitled "La Toilette" (15). The figure is not very beautiful, but the girl leaning against a tree in the background with a book is a charming bit in the composition of the whole.

One or two other figure-pictures, especially "Le Passeur" (17), a man fording a brook, are of interest as showing Corot in a light in which he is not often seen. They are probably early works.

A COLLECTION of small water-colour drawings by Mr. C. E. Hern, under the title "London Churches," is on view at Messrs. Dowdeswells' Gallery in New Bond-street. Many of these show much artistic feeling, colour and effect. Putney church (which is hardly a London church) is shown in a misty, morning effect, with part of the old bridge, now removed. The prim architecture of "St. Mary's, Paddington," and "Holy Trinity, Clapham," comes out with much effect in a snowy scene; in both of these the atmospheric effect is exceedingly good. "St. Clement Danes Strand," is well treated in a rainy day view, and "St. John's, Paddington" groups well in an autumn scene with a warm late-evening sky behind it. Some of the drawing of the architecture is, however, open to much criticism in regard to perspective. We have often remarked on the inability of many artists who treat architectural subjects to draw circular buildings in perspective correctly,—inability of carelessness. The artist here is in the same condemnation. In his view of St. Paul's, a large drawing than the others, the horizontal lines of the dome are all crippled, the lantern is not set properly on the top, and looks as it would when seen in elevation. "All Souls, St. Marylebone," where there is a good deal of circular work, is as bad, or worse, in this respect. The fault, in many such cases, is the same as it is here; the artist forgets that the receding circle in perspective,—supposing the case of a horizontal curve such as a string course seen from below,—is perpetually increasing its ratio of apparent curve as it recedes from the centre to the side, the ratio being greatest near the point where it disappears from view; and that in the portion nearest the centre of a circular building the apparent curve is flattest. Artists are always giving too much curve near the centre, and then running out in a straight line to the sides. We have seen this over and over again in exhibitions; indeed we believe many painters who can foreshorten an arm cannot put a building into perspective, not that the latter is not much the easier task of the two, but they neglect to study it. In the drawing of "St. Mary-le-Strand," in the collection here mentioned, the tower is not centrally over the front; and in the little cupola of "St. James, Westminster," each stage is wrong in regard to the one below it, the whole thing being out of drawing completely. The drawings have artistic merits of another kind, but that is not the way to draw architecture.

THE publishers of *L'Art* send us two large etchings by M. Daniel Mordan, one from the picture entitled "Miss à Flore" by M. Ulysse Butin, a seaside scene where a heavy boat is being pushed off into the sea, the action of the figures is fine and energetic enough, but the surf rather woolly-looking, the etching at least; we do not remember the picture. The other is from an exceedingly clever picture by Mr. J. Lavery, "Lawn Tennis," which, if we remember aright, was at the Royal Academy a year or two ago. The peculiar bright effect of sunlight given in the painting it is difficult to convey in such medium as etching; it can hardly be said to be conveyed in this case; but the figure, treated in a free, sketchy style, are admirably rendered in the etching, which provides lovers of lawn-tennis with a pictorial representation of the game, at once artistic in spirit and true in character and action.

THE exhibition of water-colours by artists of the Dutch school, now open at the Fine Art Society's rooms, includes a good deal of work that is powerful in its way, though in many cases distinguished by apparently ostentatious disregard of detail and realism. For example, De Jong's "Horse Drinking" (15) produces at first glance the impression of representing horses that have



fallen down on ice; there is certainly no indication that what conceals part of the animals is water. The architectural interiors by Bosboom (63 and 75) are mere scrawls, in which a smear with a brush passes for the modelling of a moulding, and a few dabs for a carved capital. This sort of thing passes muster with some foolish people, we presume, as a novelty, but it is mere botching, not art. Among the good things of the collection (there are many, if we regard them in the light of sketches and studies) "Dutch Meadows, near Gouda" (7), by Herr Roeloss, a typical Dutch subject, made only out of level grass, cows, and a wooden railing; the "Sewing Lesson" (11), by Herr Neuhuys, an interior with two figures effectively lighted; a "Dutch Village" (19), by Herr Bastert, an admirable little work; "The Waterfall" (57), by Herr Mesdag, a regular hurry and rush of water; "The North Sea" (67), by the same artist, cold enough in colour to be the North Pole, but fine in the movement of the sea and wildness of the sky; "The Heath near Ede" (103), by Mme. Mesdag van Houten, a fine piece of "blottesque"; and two figure subjects by Herr Artz, "Day Dreams" and a "Sunny Day" (100 and 111), of which the latter is beautiful; it represents two or three peasant girls, treated in a kind of abstract decorative manner, on sand-hills near the sea, against which the standing figure is relieved; this is a really artistic work in the best sense.

THE set of sketches in oil (for they are no more) by Mr. A. Ludovici, called "London Life," exhibited at Messrs. Dowdeswells' gallery, represents most prominently the quality which the French call *chic*. They are clever, smart, and vulgar; the latter especially. The faces of the figures are mostly merely dabs of colour, the lawns and streets mere of paint; but the action and character of a certain sort of Londoners is often well set off. One of the best is "A Fare" (5), a girl getting into a hansom; another good one is the young woman leaning over the rails of a pond, with the title "Skates" (21), one of the few well-painted heads in the collection. There are other clever sketches among them, but they do not represent "London life," except of a very third-rate sort.

#### LETTER FROM PARIS.

It is now about three months since the competition for the design for the diploma of the Exhibition was held at the Hôtel de Ville. At its first competition, of which the *Builder* made some mention, the jury, out of 150 competitors, chose the designs of MM. Daniel Langon, Louis Bonnier, Henri Danger, Daniel Dupuis, and Victor Galland. The second competition has just been decided, and the sketch of V. Galland has been chosen. The subject of this composition represents the chariot of Progress, drawn by lions, and guided by different figures personating the several nations.

As regards the Exhibition itself, the preparations continue in all directions, being very much assisted by the fine weather. In the Palais des Beaux Arts, M. Fornigé has made up for a great deal of lost time. At night the work is carried on by electric light, and the interior decoration of the dome, as well as the galleries, is getting on rapidly. It is the same in the Palais des Arts Libéraux, where the interior installation is carried on without interruption. In the Palais des Exposition Diverses, the interior of the principal dome (of which the height is about that of the Panthéon) is still filled up with scaffolding. On the other hand, it is finished in the gallery reserved for the manufacturers of the State, of which the arches are ornamented by colossal heads of the Republic, relieved against a red background with palms and garlands. In the galleries of the different industries legions of workmen are at present occupied in arranging the cases. The designation of the classes and of the objects finished, and these galleries could easily be opened to the public at the beginning of April. In the foreign sections, generally less advanced, we are glad to see that that of England is likely to be completed first.

In the Belgian Court, the installations are only indicated by boarded partitions. In

Austria-Hungary the walls are not finished. In the Russian, Italian, Portuguese, and Spanish sections, there is no trace of decoration or installations. The Swiss section is in progress, and in that of the United States of America the interior painting is almost completed.

In the Galerie des Machines all the nave is already ornamented with the armorial bearings of all the principal cities of the world, as well as with coloured glass. In the part of the Exhibition which runs along by the side of Avenue Suffren, the road so picturesquely imitated from a street in Cairo is almost finished, as well as the Bazaar Marocain. On the other hand, the Russian and Chinese pavilions are simply indicated by notice-boards. In the gardens, the different foreign palaces are very far advanced. Chili, Venezuela, Bolivia, Brazil, and the Argentine Republic are already showing their very original buildings, which will make this part of the Champ de Mars one of the most brilliant and attractive spots of the whole Exhibition.

Opposite, and on the side of the Avenue la Bourdonnaye, are the "Théâtre des Folies Parisiennes," the gas and telephone pavilions, and also that for the Press, which is finished, furnished, and decorated. Lastly, the Rue de l'Habitation, constructed by M. Garnier, by the side of the Seine, is completely finished. In addition, all the buildings near the river (Exposition Maritime et Fluviale), the panorama of the Transatlantic Company, the Palace of Alimentary Products, &c., are, like the agricultural section, almost completed.

As for the Eiffel Tower, it has already attained a height of 280 metres, and in a month it will be completed by the turret and the electric lantern, which will give it its greatest height of 300 metres. It is curious to notice to-day how inferior is the effect produced by this enormous piece of ironwork to the idea that people had of it in advance. Seen from the environs of Paris, it overpowers the city, and appears immense by the side of the large monuments, which are reduced to very small dimensions; but the nearer one approaches it, the less is one aware of its colossal proportions, and the eye hardly sees what relation can exist between the thin termination of the tower and the gigantic arches of its base. There is an optical illusion about it which will always weaken its general effect, and disappoint the hopes of the promoters of this useless attempt to astonish the eye by its giddy height. Our first impression about it is not the least altered, and in a decorative and architectural sense the complete Eiffel Tower pleases one no more than its first sketch.

Let us add, to finish our sketch of the Exhibition works, that the total expenditure up to this date has been 29,432,160 fr.—more than three millions below the original estimate. All the honour of this excellent result is undoubtedly due to M. Alphand, and if the official inauguration is really to take place on May 5, and not to be held, as it was in 1878, in the midst of incomplete installations and empty cases, it will be all owing to his indefatigable activity.

From an artistic point of view, the Exhibition offers considerable interest, and already the excitement in the studios is much greater than it has been in previous years. There will be, in fact, in the month of May, a retrospective exhibition, comprising the *chef d'œuvres* of French art from 1789 to 1889; an exhibition of the art of ten years, from 1878 to 1889, including the most remarkable pictures and statues produced in France and elsewhere during this period; and lastly, the annual Salon, which, from all that we can learn, will not suffer, in spite of the numerous artistic exhibitions going on at the same time. The Exhibition of Water-colours has opened its doors at the same time as in other years. Although very brilliant, it does not include this year many of the painters most known to the public, such as MM. François Déraille, James Tissot, Morot, J. Lewis Brown, and Cazin. On the other hand, MM. Harpignies, Besnard, Lhermitte, Le Blant, Heilbuth, and Madame Madeleine Lemaire, have obtained their habitual success. We may mention also amongst the number a series of pretty views of the Park of Saint Cloud, by M. Roger Jourdain.

Almost at the same time, the annual exhibition of the Art Club in the Rue Volney opened. It includes this year 267 pictures and sketches, but, as in all the exhibitions of this kind where amateur talent predominates, the general result is somewhat insignificant. We may except the fine portrait of M. Elie Delaunay, a Flemish landscape by M. Cazin, a "Salomé" by M. Carolus Duran, and some other works by MM.

Benjamin Constant, Henner, Damoye, and Montanard. On the whole, however, it is a feeble exhibition; and so is that of the "Femmes Peintres et Sculpteurs," which has for the eighth time taken possession of the Palais d'Industrie.

In regard to "expositions particulières," as they are called here, we may mention that of the works of Feyen-Perrin, which will open on May 1 at the École des Beaux Arts, and will be immediately followed by that of the works of Cabanel. This last, both for the quality and the number of the works exhibited, will be one of great interest.

There is at present at the Hôtel de Ville another exhibition which, side by side with pictures of a certain value, includes works that are absolutely ridiculous. It is connected with a competition opened for the decoration of the Mairie of the XIVth Arrondissement, built by M. Aubartin. Among the designs worth mentioning are those by M. Henri Martin, Lionel Royer, Debon, Leenhardt, and François Flameng. This last deserves the prize, and his designs are charming.

Shortly afterwards there will be a new competition for the decoration of the Mairie of Nogent-sur-Marne, and almost at the same time painters will be invited to compete for the decoration of the Salon called the "Siège de Paris" at the Hôtel de Ville, as well as for the "Galerie à Arcades," parallel to the Salle des Fêtes. We must mention also an architectural competition for the construction of a new Mairie for the Xth Arrondissement of Paris.

At the École des Beaux Arts, a committee presided over by M. Charles Garnier has given its verdict, some days ago, on a competition instituted under the title "Prix de Reconnaissance des Architectes Américains." The subject was "Monument à la Fraternité Artistique," and among the nine designs sent in, the committee has adjudged the prize to M. Huguet, pupil of M. Blondel. The designs submitted in the first class at the École have also been examined, under the presidency of M. Ginain. The subject was "Un Hôtel du Ministre de la Guerre." The first prize was not awarded; second medals were awarded to MM. Recoura and Bossis, pupils of M. Pascal; M. Mougnet, pupil of M. Ginain; M. Pauline, pupil of M. Guadet; and M. Honoré, pupil of M. André. In the "rough sketch" competition, for which the subject was a "Foot Bridge," out of fifty-five competitors second medals were awarded to MM. Guénot, pupil of M. Guadet; and a first mention to M. Charles, pupil of M. Ginain. Lastly, M. Ginain has been presiding over a competition instituted under the title "Prix Edmond Labarre," of which the subject was "A Summer Residence for the President of a Republic." After having examined 152 designs sent in, the jury gave the prize to M. Francastel, pupil of M. Ginain.

In the section of painting a successor has to be provided to fill the place of M. Cabanel, who has also left a void place in the Institut which is eagerly sought for. Among the candidates who are seriously considered are MM. Lefebvre, Jean Paul Laurens, Henner, and Détaillé. It is expected that Lefebvre will carry the day.

They are also occupied at the Institut about the formation of a new museum to be installed in the right wing of the Palais Mazarin. The museum is due to the generosity of the Comtesse de Caen, who has left great part of her fortune to pay a pension of 4,000 francs for three years to study at Rome. In return for this legacy, she imposes on the artists the obligation to contribute by their work to the decoration of a museum to bear her name. In conformity with the terms of her will, all the Prix de Rome men since 1876 will figure in the new museum, the entrance money for which is to be given for soup and clothes for poor people.

The transformation of the old site of the Tuileries is at length fairly taken in hand, and thanks to the credit of 280,000 francs recently voted by the Chamber, this large space, so long cumbered with ruins, weeds, and sheds, will soon be a place of plantations, flower-beds, green lawns, and statues, a new place open to the public. The "grille d'honneur," which has seen so many Royal cortèges pass, and so many hideous insurrectionist cohorts, has been removed; Prince Stirbey has bought it to ornament his château at Bécon (the place where Carpeaux died). The general aspect of the place will shortly have changed completely, and nothing will recall the civil battles and tumults that have so frequently taken place here. The new square will serve as a frame for the Arc



de Triomphe, built in 1806 by Percier and Fontaine. This elegant monument, inspired by the arch of Septimius Severus at Rome, is worth a word of description. It is about 14½ metres high by 19½ in width. Like its model at Rome, it includes three arcades, but it has also a cross arcade. Four Corinthian columns, in coloured marble with bronze capitals and bases, support, on each of the two principal fronts, an entablature, surmounted by a frieze in *griotte* marble. On the entablature, over the apex of each column, is a statue in white marble, representing a soldier of the First Empire. Six marble bas-reliefs, representing some of the battles of the same epoch, adorn the four faces of the monument. The attic is surmounted by a pedestal, on which were placed the celebrated horses of St. Mark, brought over after the Italian Campaign, and returned to Venice at the Restoration. They have been replaced by a quadriga in bronze, directed by a figure of Victory. The group is by Bosio.

Before quitting office, M. Lockroy had organised a Committee to examine the sketches and designs presented for the decoration of public monuments. The new Committee will be composed of forty-two members, presided over by the Minister, and including among its numbers several architects, notably MM. Garnier, Bailly, and Dutert. Thanks to this organisation, instead of wasting the resources of the State in a number of small commissions, one will be able to carry out the decoration of public buildings on a system, and by the selection of the best artists for the work.

The sculptural decoration of the Panthéon will be one of the first questions submitted to the new Committee. According to M. Lockroy's idea, this is what it will consist in. In the hemicycle which terminates the axis of the nave,—that is to say, in the place of honour,—will be a commemorative monument of the French Revolution. At the base of the piers on which the dome rests will be executed four alto-reliefs, symbolising the Mediæval period, the Renaissance, the Seventeenth Century, and the Eighteenth Century, treated in a similar manner to those by Rude on the Arc de Triomphe de l'Étoile. Five funeral monuments will commemorate the celebrities who have the honours of the Panthéon. Before the stair leading to the chévet will be the cenotaph of Descartes. Between the columns near the entrance to it, will be those of Voltaire and Rousseau. In the two arms of the transepts will be erected the monuments to Mirabeau and Victor Hugo; this last will be raised above the vault where the remains of the poet rest. Lastly, between the columns which extend longitudinally and horizontally will be erected the statues of great men who have assisted France in all manifestations of human thought or energy. These will be selected and arranged in such a manner as to represent the development of French National History. The great artists of the romantic period will be grouped around the tomb of Victor Hugo; the men of the Revolution around that of Mirabeau; the philosophers of the eighteenth century around those of Rousseau and Voltaire. The statues already executed since the first project for decoration, started in 1874, will be placed in front of the engaged columns which serve as frames to the paintings affixed to the walls. At the two extremities of the transepts, in the places now occupied by tapestries which harmonise very ill with the general bright tone of the walls and the paintings, there will be placed against the wall monuments to Lazare Carnot, "the organiser of victories," and to Armand Carrel, Manuel, and General Foy, all of them Liberal orators, celebrated in the contest against the Monarchy of the Bourbons.

Such is, in its main lines, the last project elaborated by M. Lockroy,—understood to be from the ideas or suggestions of M. Laroumet, Directeur des Beaux Arts. The cost of it is estimated at about 2,500,000 francs. It would realise a grand effect, and is well worth executing. But the Ministry has gone out, and political considerations at present push everything else on one side, to the great detriment of the artists.

It is intended to commission from M. Mercié a statue to Alphonse de Neuville, and from M. Rodin a bust of Castagnary, which is to crown the monument to be erected at Montmartre, from the design of M. Faure Dujarric. There is talk also of erecting in the Quartier Latin a statue to Alfred de Musset. M. Chapu has been commissioned by the Société des gens de Lettres "to execute a statue of Balzac,

which will be placed at the Palais Royal in the Galerie d'Orléans. The same sculptor has made a sketch for the monument to Flaubert, the author of "Salambo." There is also to be noted an intended statue to Victor Noir, who it may be remembered was killed in 1870 by Prince Pierre Bonaparte, whom he had insulted,—a tragic occurrence which gave rise to a "cause célèbre," and was in some sort a kind of prelude to the fall of the Empire. The commission has been assigned to M. Dalou.

#### DECORATIVE MATERIALS.\*

BY PROFESSOR AITCHISON, A.R.A.

ROMAN architecture, from the latter part of the so-called Republic up to the transfer of the capital to Byzantium, was for the most part clothed architecture. I say "so-called Republic," for in reality, from the supremacy of Cæsar Marius to the assumption of the Empire by Augustus, it was a military despotism, only with two or three despots occasionally instead of one.

From the fact of Roman architecture being clothed, and consequently its clothing only being seen, we should get but a poor idea of its splendour if the consideration of the visible parts were omitted. Many here have seen St. Mark's at Venice in all its glory of marble, glass, mosaic, and gilding, and we can picture to ourselves what it would be like if it were stripped of its marble linings, its mosaic, and its gilding, and nothing were left but the bare brickwork, and such columns only as are necessary for its support.

Instead of a jewelled casket we should have a dismal brick structure, with a few marble columns and cornices. We get the true aspect of Roman buildings at their zenith from those shown in Italian pictures of the Middle Ages and early Renaissance days.

In a picture by Pinturicchio (1454-1513), from the Appartamento Borgia in the Vatican, there is a triumphal arch. The whole body of this structure is of purple porphyry; the columns are of africano, or pavonazetto; the frieze and centre of the attic is of blue; and nearly all the rest, including the capitals, bases, and pedestals of the columns, and the statues, are of gold or gilt.

The Romans did occasionally use pure white marble from Paros, Pentelicon, or Luna; but for the most part, even for column shafts, they preferred coloured marbles. I say "even for shafts," on account of the difficulty of getting sound marble of great length, and large diameter, of coloured marbles that will bear weight. Large shafts are mostly of white marble, grey striped Greek, giallo antico, pavonazetto, cipollino, or of red or grey Egyptian granite; and when I speak of large shafts, I mean of 3 ft. diameter and upwards. Below this diameter they may be found of all sorts of precious marbles, including red porphyry. One of the most beautiful I have seen is a shaft of verde antique in one of the churches at Venice.

In Roman times, all stucco work, both inside and out, was painted, and often gilt; variegated marbles were largely employed as wall-linings, even in private houses, from the first century B.C.; and bronze, as a rule, was either plated with gold, burnished, or damascened with silver. Slabs of coloured glass were used in his temporary theatre by Scæurus, Sulla's son-in-law; and Pliny the Elder informs us Agrippa would have used glass mosaic instead of encaustic painting for the vaults of his Thermæ, if it had then been invented. In no building did greater magnificence prevail than in the Thermæ; in fact, the only building that ever vied with them was Nero's Golden House. Martial has given a sketch of some of the marbles used in the baths of Etruscus:—

"These stones in chequered order put,  
From Phrygian rocks and Lydian cut,  
Contending with Tygetus' green  
Marble for gracefulness are seen;  
Erat cnyx there panting sweat,  
And flaming opibites burn with heat."

Lib. VI., 42, sixteenth Century MS.

And Statius describes the gables of its halls as being effulgent with various coloured glass, and the water as being conveyed by silver pipes, and falling into silver basins. M. Lepidus, consul (77 B.C.), had used lintels of Numidian marble. Licinius Crassus (140-91 B.C.), the orator, is said by Pliny to be the first Roman citizen who used

six marble columns for his hall, about 12 ft. high, of a sort of Cipollino, called Cipollino, and these were from Mount Hymettus, at which he was called, by Marcus Brutus, the "Palatine Venus." Scæurus imported 30 columns of the Lucullan marble, 38 ft. high for his temporary theatre; these were afterwards used in his house, the sewer contractor compelling him to give security for the possible damage to the sewers while they were being moved through the streets.

As we do not want to trace chronologically the spread of Roman magnificence, it may perhaps as well to give the Latin and Italian names of some of the principal marbles and fine stones used by the Romans in their buildings. I have followed Corsi in the arrangement, and I have consulted Mr. Burnham's book, and in all cases alluded to Mr. Kendrye's personal survey of ancient quarries, when they differed from the other two. I may mention that in the allusions to marble made by the Latin poets the neighbouring towns, mountains, or rivers are often used to denote the source of marble, when these are more convenient for the verification.

I did translate and abstract from Corsi's description of the white, coloured, and figured marbles, the serpentine, alabasters, granite porphyries, and murrha, with the situation of the quarries, where known, and the few ancient buildings in Rome where these marbles and fine stones were used, and are still to be seen; seeing that there are more than one hundred different descriptions, which extend to over twenty pages of manuscript, I thought that human endurance would not suffice for this fiction, so I shall publish the list on the walls. I am sorry I am obliged to omit reading it, not only because it may be of use to Classical scholars, and because the bulk of all the marbles in the world have been taken from the buildings of the Romans, but because we have in England the two magnificent and, I believe, unique collections of specimens made by the learned Corsi; the grand one at the Oxford Museum is contained in two cases, which were removed into the light for me to see, some years ago, by the kind offices of Sir Henry Acland. Corsi's own private specimens, about 1½ square, in slabs of white marble, are now in the Geological Museum, Jermyn-street; here they are put vertically, under windows, but they can be seen if you kneel down, and have the use of a lantern though I may say that marble of this size, practically useless for identification, as in veins and brecciated marbles pieces might be cut out which would not only give a perfectly erroneous impression, but which might make one believe that a fine brecciated marble of green or purple was pure black or white, and in cases of large breccias and in other marbles containing masses of large veining, interspersed with plain ground or large flowering, even when the specimen is most characteristic, you cannot get the proper effect of the pattern, nor of the striking contrasts. I may also remark that though some ancient quarries may yet be undiscovered, it is quite possible that many of the varieties were got from quarries near at hand.

When there was such a passion for coloured marbles, and when people doubtless paid extravagant prices for rare pieces supposed to come from distant parts, it is most likely that the site given was in many cases imaginary, particularly when we know that almost all large quarries produce a variety of different coloured marbles. At Siena, for example, there are forty varieties, ranging from black to white.

I may here mention that I think I have discovered the Classic name of Rosso Antico—was Marmor Tenarium, like the Nero Antico, its quarries being comparatively close to them. These quarries having been re-discovered, Rosso Antico is now by no means a very costly marble. I have used it occasionally within the last twenty years for slabs, fenders, and panels.

The Numidian marbles have also been re-discovered in Tunisia and Algeria. The quarry of the celebrated giallo antico are in Tunisia, of which half the large interior columns of the Pantheon are made, and those to the Arch of Titus.

The misfortune of Corsi's grand collection being at Oxford is twofold, even excluding the fact that the specimens cannot be properly seen. Oxford is a long way off, and is not a centre of marble working, and consequently is next to impossible to carry down to Oxford specimens of adequate size to compare with the

\* This list of marbles will be published in the Builder next week.

\* Being the fifth Royal Academy Lecture on Architecture this Session, delivered to the students of the Academy on the 11th of February last. (For the previous lectures see Builder, pp. 85, 103, 121, 132, ante.)



unique ones. That his own specimens are put where they cannot be seen is a scandal. I am of complaining of the authorities at the Geological Museum in London, as they have no room. The Museum wants enlarging to enable it to hold the specimens of the public, which it was made cannot, for want of room, be carried out, i.e., the showing to the public of the specimens of all the marbles of the united Kingdom, its dependencies, and colonies. I take so little interest in architecture and the arts connected with it that if a book of antique marbles, with proper coloured illustrations, are published, it would not pay its expenses. It must be done by some wealthy and enthusiastic patriot. Even our finest public and semi-public buildings are not published, except in a French work—St. Paul's Cathedral, the Houses of Parliament, St. George's Hall, Liverpool, the Taylor and Randolph Buildings, for instance. The Reform Club has been published by M. César Daly in his "Revue Générale." Mr. Burnham, in his book on lime-stones and marbles, has only given forty-eight illustrations; eight, at least, are of American marbles, eight of Algerian onyx and modern marbles, and thirty-two of antique marbles, and six plates are only 3½ in. by 2½ in.

From Algeria comes an ivory-coloured marble, of magnificent crimson breccia, the Algerian onyx, and other coloured marbles.

**Morpha.**—This has had an infinity of writing bestowed upon it, and were we to be guided solely by the description, we could not doubt its solution that it was Derbyshire floor spar, commonly called "Blue John"; the colour is blue, the softness that may be crushed by the thumb is like, and its treatment with mastic and oil makes its odour the same, which would still more powerful if warm fluids were poured into cups of it; and he found antique specimens of it: but when it is first taken from England was unconquered, and, as far as I know, no trade in floor spar was carried on. The cups, &c., taken from Mithridates by Pompey the Great are the first that are mentioned, and Pliny says it came from the land of the Parthians, and the best from Carmania, in Persia; mainly from this last circumstance, modern mineralogists consider it to have been agate or jasper from Siberia. Pliny says baster is so called from the town Alabastron, in the Nile (El Molmar).

**Oriental Alabaster.**—Corsi believes that oriental alabaster and onyx were often confounded. Onyx is said to be so called from a Greek word *ὄνυξ*, the nail, from its resemblance in colour to the human nail. It quotes Genesis (chap. ii. v. 11, 12):—"the name of the first is Pison; that is the land compasseth the whole land of Havilah, there is gold; and the gold of that land is good; there is bdellium, and the onyx stone." It says Calmet believed this to be the Oriental baster. The hard Oriental alabaster is carbonate of lime, and very much harder than our alabaster, which is sulphate of lime. It says:—"It is found in the vicinity of Thebes, in Egypt, and of Damascus, in Syria, that Damascus being whiter than the others. The softest kind, however, is that of Carmania, next being the produce of India, and then of Syria and Asia. The worst in quality that of Cappadocia, it being utterly destitute of lustre. That which is of a honey colour is most esteemed, covered with spots curling whorls, and not transparent. Alabastrites is considered defective when it is of a white or colour, or approaching to glass in appearance." That which he says is most esteemed closely represents the columns of the balban in the Basilica of "St. Paul's without Walls" at Rome, the shafts of which are in several lengths, and were sent to the Pope, Gregory XVI., by Mohammed Ali, the then sultan of Egypt.

**Lapis atraticus**, verde antique, is said to come from Thessaly, and to have been so called from the neighbouring town of Atrax, near to the river Peneus, and not far from the sea. The quarry was said to be worked in the open plain. A quarry was found in Italy by Mr. Brindley, but not in this nation. What we know as verde antique is appreciated marble, fragments of snow white or black being imbedded in a green paste. The rarest specimens are said to have blue in them. The green varies from a heavy bluish green to the most brilliant emerald green. The finest specimen of this last sort I have

seen is a table-top at Dorchester House. There is also a lovely column of verde antique in one of the Venetian churches, which Signor Boni had repolished.

There are only two marbles that have retained the names of the ancients who used them, *Marmor Luculleum* and *Breccia di sette Basi*, and one only named by the ancients *Marmor Luculleum*, Bigio Morato, a bluish-black marble that looks as if it were dusty, said to be quarried in the island of Melas, in the Nile. The *Breccia di sette Basi* was so called by the moderns because it was found in the ruins of the villa of Septimius Bassus, on the Appian Way. It has a purple ground, covered with oblong fragments of a dull white, mixed with red and yellow, and when the pattern is small, it is not unlike the Breccia a seme Santo, so called from its resemblance to the coloured sugar-plums containing physic which are given to children; one of the columns to one of the pulpits of St. Mark's, Venice, is said to be of it, and the late Mr. Burges believed he had the frustum of a column of it in his hall at Melbury-road, Kensington.

**Marmor Synnadicum = Pavonazetto.**—This was called by the ancients indifferently Synnadicum, from the town of Synnada; Docimianum, from the town of Docimia; Migdonian, from the province; and more commonly Phrygian, from the country. It is mentioned by Strabo (l. 12, c. 3, s. 14), by Ovid, Horace, Tibullus, and Juvenal. The quarries have lately been rediscovered by Mr. Brindley. It is a white marble with red and purple veins; the best with purple patches, and the white is sometimes of the colour of old ham fat. It was one of the few marbles of which large shafts were made—half the large interior columns of the Pantheon are of it. Hadrian was a great admirer of it, and is said to have used it in his mausoleum. It is translucent, and used for glazing the chancel windows at San Miniato, Florence.

**Porphyry = Lapis Porphyrites.**—The quarries of the true Egyptian purple porphyry were found by Mr. Brindley close by Gabel Duchan, within a reasonable distance of the port of Abu Shah El Kibbe, on the Red Sea, and the material may of course now be had at a reasonable price. It never can be cheap, on account of the distance it has to be brought and the expense of working it. The main body is a fine purple red, containing small fragments of pale purple, occasionally almost white; and there is another variety, in which the ground is rather heavier and duller, with yellowish-white specks. There are grey, black, and invisible-green varieties; these mostly have the white specks. On account of its extreme hardness, it is used for mortars and slabs for grinding colours, as well as for decorative purposes.

Green porphyry, called by the Italians *serpentino*, and by Martial the green metal of *Taygetus*, is from Mount Taygetus, called the five fingers, in Laconia, Peloponnesus, and is spoken of by Strabo as having its quarries very lately opened by the Romans near the Temorian quarries (lib. 8, cap. 5). This is of a full, yellowish, dark green colour, containing fragments of almond shape of lighter green, sometimes almost white, and takes a brilliant polish, and is rarely found of any considerable size; there is a small piece on the wall I found at Hadrian's Villa, which seems to have been used as an inlay. Senior Boni sent me a piece from Aquileia that had been burnt to a deep purple-red colour when that city was burnt by Attila.

**Fine Stones.**—It is hardly necessary to describe lapis lazuli. The two sorts best known to us are the dark azure blue, with veins, or powdering of gold, which is, in fact, nothing but iron pyrites, and the sky-blue interspersed with white. It was called *Cyanos* by the Romans, or, at least, the male\* was so called, and Pliny describes the best as coming from Scythia, the next best from Cyprus, and the worst from Egypt, and he says it has the appearance of being powdered with a golden dust. (Nat. Hist., lib. 37, c. 58). Sapphirus, however, was its ordinary name, and, according to Pliny (Nat. Hist., lib. 37, cap. 59), the best comes from Media. According to him, this is the female stone. It is now found in Persia, Bucharia, Grand Tartary, China, and also in Austria. Venuti says that a pavement of lapis lazuli was found in one of the halls of the Thermæ of Titus, in the Pontificate of Innocent the Tenth (1644-1655). The most superb thing I have seen in lapis lazuli, which looks as if

it might be a bit of that pavement, is in the possession of Messrs. Farmer and Brindley. I have mentioned lapis lazuli because it is the only real blue that can be got except in precious stones, all the blue marbles being but a bluish grey.

**Lapis Mithras = Labrador Spar.**—Pliny says (Lib. 37, cap. 63):—"Mithras comes from Persia, and the mountains of the Red Sea; it is of numerous colours, and reflects various tints when exposed to the sun." It is now said to be found in Greenland, Iceland, Norway, near St. Petersburg, in the Hariz Mountains, and in America, besides the island of St. Paul, off the coast of Labrador, Canada, from which it gets its name. Corsi does not say that he ever found any antique specimen. It is now often used as an inlay in wood or marble, and if set at an obtuse angle to the light gives the most lovely peacock hues. I have so used it, but the only public place I know where it has been used is at the schools at Oxford.

**Molochites, Malachite.**—Pliny says (Nat. Hist. Lib. 37, cap. 36):—"It is not transparent, being of a deeper green than *amaragdus* (the emerald); its name is derived from the mallow, the leaves of which it resembles in colour. It was highly esteemed for making seals. Corsi says nothing about finding any pieces that have been used in decoration.

**Margarita** (a fine specimen is called *unio*), perla, a pearl).—Our word is supposed to be derived from *perna*, a ham; hence *perula*, a little ham. Pliny says:—"Perna, too, is the name given to a kind of shell-fish in the Euxine. These fish are found firmly planted in the sand, resembling in appearance the long shank of a hog." He thus explains the occurrence of pearls:—"When the genial season of the year exercises its influence on the animal, it is said that yawning, as it were, it opens its shell, and so receives a kind of dew, by means of which it becomes impregnated, and that at length it gives birth, after many struggles, to the burden of its shell, in the shape of pearls, which vary according to the quality of the dew" (Nat. Hist. Lib. 9, cap. 54).

Procopius, De Bell. Pers. (Lib. 1, cap. 4) tells the following story:—"The sea-dogs are wonderful admirers of the pearl-fish, and follow them out to sea; when the sea-dogs are pressed by hunger, they go in quest of prey, and then return to the shell-fish and gaze upon it. A certain fisherman having watched for the moment when the shell-fish was deprived of the protection of its attendant sea-dog, which was seeking its prey, seized the shell-fish and made for the shore. The sea-dog, however, was soon aware of the theft, and, making straight for the fisherman, seized him. Finding himself thus caught, he made a last effort and threw the pearl-fish on shore, immediately on which he was torn to pieces by its protector."

Though I dare say pearls were occasionally used in decoration, Pliny does not mention the circumstance. I think it quite possible that mother-of-pearl was combined with glass mosaic, instead of white or silver, as we now find it used in Saracen mosaic, all of whose early mosaic was supplied from Byzantium. Suetonius (Nero, cap. 81) says that of Nero's golden house was entirely overlaid with gold, and adorned with jewels and mother-of-pearl.

Mosaic was called *opus musivum*, which is equivalent to "artistic work." Pliny calls it *lithostrotum*, and says "it was first introduced by Sulla, and that there is still in existence a pavement formed of small segments, which he ordered to be laid down in the Temple of Fortune at Præneste"; but whether this was true mosaic or *opus sectile*, I do not know. The word used at Byzantium was *phosphorus*, from the Greek word *phosphos*, a pebble. *Phosphos* is called by the Saracens *faefyaa*. One of the conditions of peace between the Caliph Waleed and the Roman Emperor, in the early part of the eighth century, was that the latter should furnish a certain quantity of *faefyaa* for decorating the mosque of Damascus. Pliny goes on to say:—"Since Sulla's time these mosaics have left the ground for the arched roofs of houses, and they are now made of glass."

I have given a rough description of the floor and terrace mosaics at Caracalla's Therma, though on my last visit to Rome I did not see the mosaic of the Exedra with the Athletes, this pavement having been moved to the Lateran Museum; these are said to be of fine stones. While at Rome I paid a visit to Hadrian's Villa, and I there saw a wonderful floor of mosaic; the whole room was covered with

\* Stones were divided into male and female by the Romans.

\* Pliny's "Nat. Hist.," Book xxxvi., cap. 12.



earth, but they cleared a piece for me to see. The mosaic was very ugly in pattern, and startlingly vulgar in colour, but from this very fact I think the materials must have been jasper, agate, chalcedony, and carnelian; the cubes were about  $\frac{1}{2}$  in. square, so that it looked like a bit of Berlin wool work.

**Aurum = Gold.**—Massive gold does not seem to have been much used by the Romans as a decorative material, though Pliny mentions (Lib. 36, cap. 22) a temple at Cyzicus of polished stone, between the joints of which the artist had inserted a thread of gold; and golden reeds were used in the joints of the marble shrines at the temple of Zeus Olympios, by Hadrian. A gold fillet may be seen in the base of a column at the British Museum, and gold in connexion with marble was much used at Jerusalem; we read of the golden vines there. Gilding excites Pliny's wrath; he says (Lib. 33, cap. 18):—"The ceilings which at the present in private houses even we see covered with gold, were first gilded in the capitol after the destruction of Carthage, and during the censorship of Lucius Mammilius. From the ceilings this luxuriousness has been since transferred to the arched roofs of buildings and party walls even, which at the present day are gilded like so many articles of plate, very different from the times when Catulus was far from being unanimously approved of for having gilded the brazen tiles of the capitol."

Pliny describes gold as being excavated by ants in the North of India, and says (Nat. Hist. Lib. 11, cap. 36):—"The ant 'has the colour of a cat, and is in size as large as an Egyptian wolf.' Sir John Maundeville, who says he went abroad in 1322 A.D., in chap. 30 of his voyage, very amusingly enlarges on this statement, as if he had himself seen the ants digging the gold."

**Argentum = Silver.**—I have already mentioned the silver pipes and labra in baths. The extent to which the use of silver was carried in baths moved the wrath of Pliny (Nat. Hist. Lib. 33, c. 54.—12 in Bohn's translation). He says:—"Our women, when bathing, quite despise any sitting bath that is not made of silver, while for serving up food at table, as well as for the most unseemly purposes, the same metal must be employed! Would that Fabricius could behold these instances of luxuriousness, the baths of our women,—bathing as they do in company with the men,—paved with silver to such an extent that there is not even room left for the sole of the foot!"

**Æs = Bronze.**—Bronze statues were so numerous in Rome that the wits said there were more brass men than real ones, and the word "statuary" meant a brass founder, and is generally so used by English writers who are familiar with the classics,—the late Mr. King, to wit,—and as it is a word much wanted, I also use it in this sense, and not in the sense in which it is used by the artificial stone-makers of the New-road.

Pliny says Scorus had three thousand statues erected on the stage of what was a temporary theatre only, and Juvenal tells us that basins and frying-pans were made out of the statues of the great Scaurus.

The Romans employed several sorts of bronze,—Corinthian, Delian, Agnetan, and Hepatizon, or liver-coloured, speculum metal, and Aurichalcum,—this latter is supposed to be either brass or mosaic gold. Brass, as you know, being copper and zinc, or copper and lead, while bronze is copper and tin. Pliny says it is curious that they stain it when made into statues with bitumen, as statues are mostly gilt; and he tells us that Nero had a statue by Lysippus of Alexander the Great when an infant, which so delighted him that he had it gilt; "this addition, however, to its value, so domain, detracted from its artistic beauty that the gold was removed, and in this state it was looked upon as still more precious, though disfigured by the scratches and seams which remained upon it, and in which the gold was still to be seen" (Nat. Hist. Lib. 34, cap. 19).

Besides the statues of Alcibiades and Pythagoras, that were erected in Rome, Pliny,—if I read him aright,—says "that statues of Hannibal, even, are to be seen in three different places in that city, within the walls of which he alone of all its enemies had hurled the spear" (Nat. Hist. Lib. 34, cap. 15). Besides equestrian statues, and those in chariots, Rome contained many colossal statues, Apollo in the Capitol, brought by Marcus Lucullus from Apollonia, 45 ft. high, which cost 500 talents (121,875*l.*); a statue of Jupiter, close to Pompey's Theatre; the Tuscan Apollo in the Library of

the Temple of Augustus, 50 ft. high; Nero's statue, 110 ft. high; Vespasian changed the head for one of the sun, and we must suppose that the statue was built, as Pliny says Zenodotus, the statuary, [was unable to cast it, and thus this statue proves that the art of fusing brass was then lost. The other colossi of those days were: one at Tarentum, 60 ft. high, too big to be removed to Rome; one of Mercury, made by Zenodotus, and put up in the City of the Avern (Clermont Ferrand), which took ten years to complete, and cost 400,000 sesterces, roughly 3,531*l.*, and which, he says, was the largest of our own age. There is probably some mistake as to the cost, and sesterce has been mistaken for sestertia, which would make it 353,160*l.*. As he tells us that one 45 ft. high costs 500 talents, 121,875*l.*, this sum does not appear out of proportion.

There was also the colossal statue of the sun, which stood formerly at Rhodes, and was the work of Chares, the Lindian, a pupil of Lysippus, no less than 70 cubits in height—105 ft. It was finished by Laches of Lindos, Chares having committed suicide.

"This statue, fifty-six years after it was erected, was thrown down by an earthquake; but even as it lies, it excites our wonder and admiration. Few men can clasp the thumb in their arms, and its fingers are larger than most statues. Where the limbs are broken asunder, vast caverns are seen yawning in the interior. Within it, too, are to be seen large masses of rock, by the weight of which the artist steadied it while erecting it. It is said that it was twelve years before this statue was completed, and that 300 talents were expended upon it (only 73,125*l.*); a sum raised from the engines of warfare, which had been abandoned by King Demetrius (305 B.C.) when tired of the long-protracted siege of Rhodes" (Nat. Hist. Lib. 34, cap. 18).

Gibbon says, "but the massy trunk and huge fragments lay scattered eight centuries on the ground, and are often described as one of the wonders of the ancient world. They were collected by the diligence of the Saracens, and sold to a Jewish merchant of Edessa, who is said to have laden 900 camels with the weight of the brass metal" (Gibbon, "Decline and Fall," cap. 51). This was in the days of Moaweyah, who died 679 A.D.

I mentioned the bronze bosses for the lamps, still remaining on the vault of the tepidarium at Diocletian's Baths (now the St. Maria degli Angeli). Bronze doors were at first confined to temples and public buildings, but were eventually used for private houses.

The Temple of Vesta and the Pantheon had their roofs covered with bronze, and the latter had the eye lined with it, if the whole inside of the cupola was not lined too, and the original inside capitals were also of bronze. We have heard of the brazen girders and lattices at Caracalla's Thermae, as well as those of the portico of the Pantheon. Window-lattices are believed to have been of bronze, though lead lights were found at Herculaneum.

I give you an amusing story about Corinthian brass from the Satyricon of Petronius: Trimalchio, the freedman, who is the picture of a vulgar Roman millionaire (he was, in fact, sixty times so, for a million sesterces was only about 10,000*l.*, and he tells us he had sixty millions). Being anxious to show the extent of his wealth and learning to his guests, he had the news of what had occurred in his domain read out between dinner and dessert, and when he hears of a fire in the gardens of Pompey he asks when they were bought, and being told the year before, he says unless he is told within six months of any purchase he will not admit it in his accounts, and talks of adding Apollonia to his domain. A guest examines a bronze salver, when the host says, "I am the only man who has the real Corinthian. Perhaps you will ask why I alone possess real Corinthian? It is because the brass-founder I buy of is called Corinth, and what is Corinthian but what you get from Corinth? But lest you should think me an ignoramus, I know very well the origin of Corinthian brass. When Troy was taken, Hannibal, a cunning fellow, and a great rascal, heaped all the brazen, golden, and silver statues on a pyre, and set it on fire; a mixed bronze was thus made. From this mass the braziers helped themselves, and made plates, dessert dishes, and statuette. This is how Corinthian brass was made,—one substance out of all, neither one thing nor the other."

**Vitrum = Glass.**—Pliny's story of the invention of glass by some merchants on the coast of Syria

(1. 36, c. 65), who supported their cauldrons cooking on lumps of nitron, which, he says being subjected to the action of fire in combination with the sand of the seashore, caused streams of a transparent liquid, hitherto unknown, to flow forth, which was the origin of glass, is said by glass-makers to be fabulous; no heat so engendered would be sufficient; the most likely story is, that a forest on an abrupt mountain in Syria taking fire, the ashes so made, mingling with the sand, and melted by the intense heat, and glass floated down the side of the mountain. Be this as it may, Tyre and Sidon were early famous for their glass, and the Egyptian glazes are said to be vitreous, pieces of which were found in a frieze at Thirynus. Pliny tells us in his day that the magnet-stone was added glass, as well as other brilliant stones, and last shells and fossil sand, and says several authors tell us that the glass of India is made of broken crystal, and that, in consequence, there is none that can be compared to it. Glass, he says, is blown into various forms, turned in a lathe, or engraved like obsidian glass, made in imitation of Obsidian glass, was used for eating statues,—he mentions Augustus,—as well as for table services; also says red and white opaque glass was made the latter being like murra, and that if glass be burned with sulphur it becomes as hard as stone. Martial tells us "it was a common practice to exchange broken glass for brimstone matches (Lib. i. Ep. 42):—

"Take those who'll th' suburbs making cry  
For broken glass, who'll matches buy."

and in Lib. x., Epig. 3, he says of the verses of his imitator, Cæcilius, that a dealer in broken glass would not buy them for a brimstone-match. It is supposed, with what truth I know not, that the glass slabs in imitation of jasper, agate, and lapis-lazuli were so treated. There are many specimens at the British Museum, and it is also believed that the second story of Scorus' temporary theatre was lined with this of this glass, and that possibly the columns were made up of hollow glass fragments.

Pliny says glass had superseded the precious metals for drinking-vessels, and before his time our friend Trimalchio had given the same opinion. He says:—"Excuse what I am going to say, would rather have glass drinking-cups; I would not. If they could not be broken, would rather have them than gold ones, now they are very cheap." He then tells the following story:—

"There was an artificer who made a glass vessel which could not be broken. Being admitted to Caesar with his gift, he made Caesar give it to him and threw it on the pavement. Caesar could not help being alarmed, but he picked up the vase from the ground. It was bruised, a brazen one would have been. Thereupon he forth a little hammer from his breast, and deftly reshaped the vase at his ease. This he did because he thought he was in Jove's heaven; that after the Emperor said to him, 'Does one else know of this annealing of glass vessels? See now.' He denied it. Caesar commanded him to be beheaded, because it should be known we should value gold like lead" ("Pet. Satyricon," cap. 51).

Pliny says that this story about Tiberius for a long time more widely spread than was authenticated. "But be this as it may, it is little consequence, for in the time of the Emperor Nere there was a process discovered which two small glass cups were made of kind called 'Petroli,' the price of which was less than 6,000 sesterces" (63*l.*), and I suppose he means by this that the glass was made of petroleum. You will see by the pieces of old Roman glass on the table that there are specimens of imitations of lapis lazuli and of opaque red and white glass ribbed and twisted glass, the flutted laticino, the mosaic, mille fiori, and the striped and banded in various colours, as well as imitations of onyx, banded agate, and jasper, one piece with raised letters on it; and many of the blues, greens, and ambers are lovely in colour.

The ruins we have seen at Rome, and drawings we have admired in exhibitions, mostly of a deep yellow or yellowish-red, and so strong an impression on us that we often picture to ourselves ancient Rome as a dingy brick or of golden-coloured stone, the people in white togas with here and there a purple stripe—in fact, as a drawing in which black, and red chalk—than as a picture resp-



lent with colour. I thought therefore it might not be amiss to give you a long list of the various coloured marbles, the glass, the gold, the silver, and the bronze, to bring you back to what, in fact, was a splendidly-coloured scene; also in the hopes of stimulating those to whom the gift of colour has been vouchsafed to bestow a deep and loving study to its harmonic arrangement. Even in the days of Augustus the white toga was getting out of fashion, and its place was being filled with clothes of more splendid colour, even when the Romans in office kept to the white toga with its purple border. You must recollect that almost every one was escorted by troops of servants and pages, splendidly dressed; many were carried about in a litter of rich woods, inlaid with ivory, amber, tortoiseshell, and gold, with embroidered curtains and green, crimson, and purple cushions.

In interiors the effects were still more gorgeous. I think every one must feel the necessity of splendid colour, when the very pavement cut out on was of lapis lazuli; there the walls must necessarily be lined with rosso antico and black marble, or with pavonazetto enriched with opus sectile, with green and purple porphyry, onyx, Oriental alabaster, africano, and verd antique, the vaults gleaming with glass mosaic and gilded bronze. Imagine that you were walking in those sumptuous and colossal halls, amid plashing fountains and the masterpieces of the Grecian chisel!

During the last century of the Republic, generals and statesmen, captains and soldiers, utters and camp followers had become familiar with the gorgeous trappings of the East, with the splendours of the Greek kingdoms in Asia, with the magnificence of Persia, of Babylon, of Lydia, and of Egypt; with men whose hair was adorned with golden grasshoppers, and whose curls were enclosed in golden nets, whose arms and armour were damascened with gold and silver, and studded with jewels; whose cloaks and tunics were of costly stuff and of gorgeous colours, often stored by the Attalic or Babylonian needle; with girdles of engraved gems, and chains of silver or of gold angling and clinking on the embossed scabbards of their swords; with jewelled earrings, and with golden bracelets and bangles on their wrists and ankles: they had drunk from jewelled cups, and played backgammon on boards of precious stones, with pieces of sculptured gems or embossed gold; ad seen or handled the chased gold scabbards beyond price, the hilts of engraved gems, and the famous damascened scabbards of Eastern conquerors, whose very horse-trappings were heavy with jewels and with gold. Probably many a silken curtain embroidered with gold and precious stones, torn from the beds or tents of Eastern potentates, kept the draught from the halls of Roman baths, where the populace bathed for a farthing; not to speak of the magnificence of Sulla, the Lucullus, and Pompey the Great, we know that Julius Cesar gave his horse to be kissed by those he pardoned at Pharsalia, and when some one remarked on this Oriental arrogance, his friends said it was not one from haughtiness, but in the hope that they might see and admire the fine pearls, and the engraved gems with which they were adorned. Fliny tells us that Julius Cesar and young "hob-nails" Caligula were great bucks in their dress, and were very fond of having their slippers embroidered with pearls. In one of his diatribes, he says, "Let women wear gold upon their arms and all their fingers, their necks, their ears, the tresses of their hair; let chains of gold run meandering along their sides, and in the still hours of the night let sachets filled with pearls hang suspended from their necks, all bedizened with gold, so that in their very sleep, even, they may still retain the consciousness that they are the possessors of such gems. But are they to cover their feet as well with gold? Much more becomingly do we record this distinction to our pages, and the dorned beauty of their youth has quite changed the features of our public baths."

**Greek Mouldings Illustration Fund.**—Mr. Penrose announces the following further subscription to this fund:—

Messrs. Carpenter & Ingelow..... £2 2 0  
**Obituary.**—We regret to hear that Mr. Charles Richard Fink, F.R.I.B.A., died at Winchester on the 25th of February, in his 36th year. He will be well remembered by many of our readers as a recent President of the Architectural Association.

### RUSTLESS IRON.

A SHORT time since a party of architects and experts were invited to see a large heat of iron pipes subjected to the Bower-Barff process of coating with magnetic oxide. One remembers very well indeed the great interest which was excited some twenty years ago by the invention of the late Professor Barff, and the display at the Royal Society and at other learned societies of gratings, tubes, brackets, and a variety of other articles, including swords and gun-barrels and other highly-polished articles. From that day to this one has never ceased to hear of Barff's process, but apparently the rustless wares and goods have not come into such extensive and every-day use as might have been expected. In fact, the special display in question may be taken as a reminder to a very practical profession that there is ample scope for a very much wider recognition of the Barff process in architectural and building specifications. The works at Skin Market-place, on the Bankside of the Thames, by Southwark Bridge, are small, but very interesting, as containing, first, the original Barff apparatus, and, secondly, the more complete and satisfactory Bower modification.

The process itself is very simple, and based on almost elementary chemical principles. The iron goods are heated to glowing redness, and then a continuous current of superheated steam is allowed to play upon the radiant mass. Oxygen from the steam is absorbed by the heated iron wares, and a double oxide is formed superficially, and penetrates in depth into the mass of the metal, according to the length of time the action is allowed to go on. Generally in practice this permeation is kept within the limit of the  $\frac{1}{16}$  of an inch, and the time of operation under twelve hours. The term "rustless" is thus seen to be in one sense a misnomer, for the iron is really double rusted to the extent that it cannot rust any more when so coated. Exposed to the ordinary wettings and dryings and weather action, articles such as gutter-gratings, rain-water pipes, and railings, endure for a very long time before they undergo the slightest change or reduction of condition. It is still possible after severe attack, continued for very considerable periods, that the peroxide should begin to be robbed of one particle of its oxygen, and be reduced spot by spot to the condition of the common red rust, or single oxide. It is, however, correct in a general sense to call the wares so produced "rustless," because the process is undoubtedly a preservative whose influence is very slow indeed in giving way, and the Bower-Barff process will compare in efficacy very favourably with paints and lacquers.

The practical value of the process, indeed, over the ordinary paint coatings may be well illustrated in the matter of the down rain-pipes from roof to ground. For repainting these, long ladders and other paraphernalia are needed, and even then the workmen cannot well get at the rear of the pipes contiguous to the walls. Long lines of rust may consequently be almost universally observed in this vertical interspace, causing rapid decomposition of the pipes. For pipes which had been submitted to the Barff process there would be no more deterioration on the one side than the other; whilst for years there would be no need of repair. If any such need arose, the pipes could be taken down and reprocessed.

The limitation of the time and of the extent to which the process shall extend have for their object the prevention of any sensible decrease in the strength of the iron goods. The superficial protection is all that is really required, and the extent of its permeation need be no more than will suffice to avoid injury by external bruises. In experimental tests made by the late Sir Joseph Whitworth on some pipes of ordinary and processed metal, it was shown that under various pressures, there was no appreciable difference up to twenty-one tons; with twenty-two tons' load, before the process, the deflection was 0.0002 of an inch; after the process, with twenty-one tons, it was 0.0008; with twenty-three tons before process, 0.0008; and with twenty-two tons afterwards, 0.0022 of an inch. By these tests, therefore, some approximate knowledge on that point can be clearly gathered.

In the original Barff apparatus the iron goods were placed within a large iron cylinder, heated on the outside, the heat radiating through the wall of the cylinder, and so bringing the goods within it to a bright red heat.

Superheated steam was then admitted into the cylinder, and the process performed, the hydrogen liberated escaping by a pipe. In the Bower process the cylinder is abandoned, and there is substituted a large fire-brick chamber. The furnaces are built in separate compartments, about 8 ft. high by 4 ft. broad, and these are fed with coal from above, a small draught being admitted below to the extent sufficient for gas to be continually generated. This gas is admitted in a continuous stream into the heating-chamber, where it is met by a corresponding current of air, which has worked its way from the outside atmosphere by numerous pipes descending into the earth and rising again underneath the hot-chamber in such a way as to get well heated in its passage. The combustion of the air and gas is thus rendered perfect, and a fine glowing heat is maintained in the chamber.

The goods, placed on a long trolley on sixteen wheels, are run into this chamber, the ends of which, are then closed up. After a time, when the goods are thoroughly hot, the gas fire is cut off, and the superheated steam current, generated in a separate boiler, is introduced and kept up for some hours, according to the nature of the work in hand. No special provision is made for the escape of the residual hydrogen from the steam, which gets away as best it can through the brick structure of the chamber and through the flue or chimney stack. Such furnaces can be easily managed, and may be erected in any provincial district and attended to by ordinary labour. There is therefore no difficulty either in the process itself, or in the multiplication of small works for local operations by which the more expensive transport to any distant central station or works would be avoided. The cost is, perhaps, a little high, and this may be the chief reason of its hitherto limited adoption. As gilding, silvering, and painting on a "rustless" surface has perfect adhesion and will not flake away nor blister, there are many subsidiary advantages attached to the process which should cause the leading men in practical undertakings to give attention to it as having results which are really scientific and useful.

### ARCHITECTURAL ASSOCIATION VISITS.

THE second visit of the present session was made by some of the members of the Association on Saturday last to several buildings in course of erection from the designs of Messrs. Martin & Purchase, in Charing Cross-road and Shaftesbury-avenue. The first building visited was that at the junction of Charing Cross-road, Oxford-street, and High-street, Bloomsbury, known as Imperial Mansions. This building is arranged on a semicircular site, and consists of a range of shops on the ground-floor, with basements under, communicating by means of a circular iron staircase. The upper stories, which are separated from the shops by a fire-proof floor, are planned for letting as residential flats or offices. Access to the upper floors is obtained by a staircase of fireproof construction, but somewhat awkwardly planned, and a hydraulic lift is also provided for the use of the tenants. The divisions between the rooms on the upper floors are constructed on Mr. Middleton Edwards's fireproof system, and consist of light rolled iron standards, between which is placed thin sheet-iron rolled with rectangular corrugations to support the plastering, thus forming a finished partition only 3 in. thick. Accommodation is provided on the top-floor for a caretaker, who will be enabled to supply meals for tenants, if required. The exterior elevation is carried out in red brick with Beer stone dressings; but the design and detail can hardly be said to be worthy of the important position which the building occupies.

After inspecting these buildings, the members next proceeded to Cambridge-circus, where they visited the block known as Harrington Buildings, which, like the former, consists of shops on the ground-floor, with residential rooms over. In this case, however, the block of buildings is sub-divided by party-walls, so that the shops can be let either with the rooms over them or independently. The visitors afterwards proceeded to inspect a number of shops in Shaftesbury-avenue, which are of ordinary type, the rooms on the upper-stories forming part of the same tenements as the shops. This completed the visit, which was rendered instructive by the explanations of the architects, who accompanied the visitors throughout the afternoon.



## Illustrations.

## THE NEW WELLINGTON STATUE.

**W**E give this week a view, reproduced from a photograph taken specially for us, of the Wellington statue at Hyde Park-corner, together with illustrations, on a rather larger scale, of the four supporting figures at the angles, which form certainly not the least successful and interesting portion of the sculptor's work. They represent private soldiers of four of the arms of the service over which the great captain exercised rule.

On the work generally,—on the fine qualities of some portions of it, and what we venture to consider some defects in other respects, we have already commented, and need not repeat what has been before said. It may be as well to put on record here the main facts as to the carrying out of the work.

The bronze statue of Wellington and the angle supporting figures were designed and modelled by Mr. J. E. Boehm, R.A., and were cast by Mr. Moore, of Thames Ditton. Mr. Boehm was assisted in designing the pedestal by Mr. Howard Ince, an able young architect, who, some years ago, gained the travelling studentship of the Royal Academy; and that part of the work, which is of red Peterhead polished granite, was executed by Messrs. Macdonald, of Aberdeen.

The platform, pavements, and surrounding alterations were designed by and carried out under the superintendence of Mr. John Taylor, of H.M. Office of Works. The marble mosaic pavement was executed by Messrs. Burke & Co., of Newman-street; and the inslab Aberdeen and Peterhead granite work, the Aberdeen granite steps and general works, by Messrs. Mowlem & Co., of Westminster.

The cost of the statue, angle figures, and pedestal has been about 10,000*l.*; and of the platform, pavement, and surrounding improvements about 5,000*l.*

## PLANS OF ROMAN THERMÆ.

By the kindness of Professor Aitchison we are now enabled to supplement the plans of the Baths of Caracalla, which we published a fortnight ago, with plans of other Roman Thermæ, which have been described in this year's Lectures in Architecture at the Royal Academy, as published in our pages during the last few weeks.

## NEW CHURCH OF ST. EDMUND, SOUTHAMPTON.

THIS church is in course of erection in the Avenue adjoining the grounds of the Convent and School of la Sainte Union des Sacrés Cœurs, by the Rev. E. Rivara. It is of local red bricks, with dressings of Ham Hill stone, and Bath stone internally. The tower and convent chapel are not included in the present contract. The total cost when complete will be about 11,000*l.*, the site having been a gift. The architect is Mr. W. Lunn; the builder, Mr. W. H. Chapman, of Woolston.

## JUBILEE MEMORIAL FOUNTAIN, KINGSTON-ON-THAMES.

ON the occasion of the Jubilee rejoicings in 1887 at Kingston-on-Thames, a sum of money was set aside for the erection of a permanent memorial of Her Majesty's Jubilee, and this, it was eventually decided, should take the form of a fountain, the execution of which was entrusted to Messrs. Doulton & Co., of Lambeth.

The fountain is constructed entirely in salt-glazed coloured stonework (Doulton-ware), and is a little over 17 ft. high, and 9 ft. 3 in. wide at the base, just above the three granite steps by which it is approached. The lower portion is divided into four sections by buttresses, at the foot of each of which is a dog-trough. Between the four large basins are perforated screens. Above each basin is a niche containing small panels, from which the drinking-water pours. In the semi-circular tops of the niches are ornamental medallions, surrounded and supported by perforated foliage. The medallion facing the road has the inscription:—

"Erected by public subscription, as a memorial Of the Jubilee of her Majesty, Queen Victoria, A.D. 1887. George C. Sherrard, Mayor. Joseph Marsh, Chairman of Committee."

On the opposite side the shield bears the arms of the town of Kingston. On the sides

between are portraits of the Queen. One bears the words

"Victoria, Dei Gratia, A.D. 1837."

and the other

"Victoria, Regina et Imperatrix, A.D. 1887."

Above the cornice of the square central portion rises an octagonal upper tier, which terminates in a dome and cupola. Mr. Arthur E. Pearce, designer to Messrs. Doulton & Co., made the design, and superintended the manufacture and erection of the fountain.

## WORKS NEAR GODALMING.

THESE consist of restorations and additions to old buildings, in the case of Rake Mill House, Darbyn'sbrook, and Littleford, and new buildings in the other cases. The materials are Bargate stone or red brick in hollow walls, Burntised Dantzic timber, filled in with concrete of silentic lime, and weather tiles.

The builder for Rake stables was Mr. R. Pink, of Milford, and for the other works Mr. Harvey Brown, of Bramley, near Guildford.

The architect was Mr. Ralph Nevill, F.S.A., of London, and formerly of Guildford.

All the tile roofs are laid in concrete plaster, on Mr. Nevill's system.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting of the present session of this Institute was held on Monday evening last, Mr. Arthur Cates (Vice-President) in the chair.

## The New By-Laws.

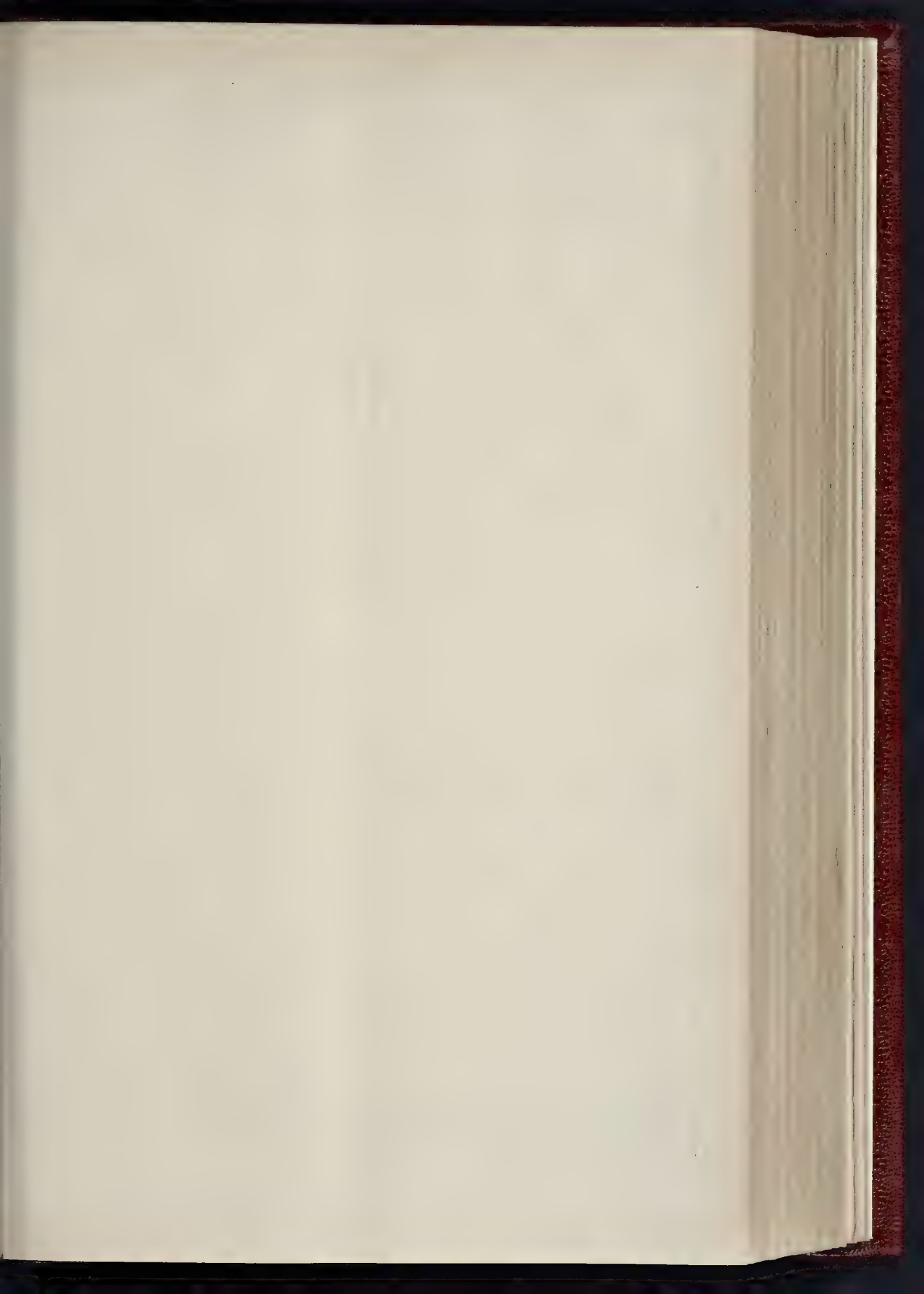
The Chairman read the resolution of the Lords of her Majesty's Privy Council approving of the new By-Laws. The first matter for the consideration of the present Council, on receipt of that approval, was the proceedings to be taken under the temporary By-Law for the election of the new Council. The new By-Laws provided an entirely new constitution for the Institute, and a Council constituted very differently from the present one, with a different system of election. The temporary By-Law provided that the present Council should remain in office until the close of the first general meeting following the election of the new Council, which new Council should, in the manner provided by By-Law 31, be elected as soon as possible after the By-Laws had been approved by the Lords of the Privy Council. The usual general meeting in May was not so far distant, and the preliminary business which had to be accomplished before the executive would be in a position to send out the necessary information for the election rendered it undesirable that there should be any election immediately, although the By-Law provided for such. The Council of the Institute therefore proposed to adopt By-Law 30 as it stood, and having completed all the preliminary arrangements, to issue, two weeks prior to the annual meeting on May 6, a list of members nominated for election on the new Council, and then to proceed exactly as provided by By-Law 30. He presumed the members would agree with the Council that that was really the earliest period at which the temporary By-Law, with all reasonable despatch, could be complied with (applause). Under the new constitution, by By-Law 9, ballots for the election of members could only take place at business meetings. The ballot, therefore, would be deferred to the business meeting of March 11.

## Specification Writing.

Mr. Thomas M. Rickman, F.S.A., then read a paper on "Writing a Specification," of which the following is an abstract:—The author began by stating that the specification was one of the means employed by the architect to carry his design into execution. The design was in his mind. The drawings presented a reproduction of the design in scale-projection; they were a representation of the idea in the architect's mind. The specification was the translation of the design into technical language, describing the selection of the materials and the construction of the whole. The duty of the writer of the specification was to translate the design, from all the materials at his disposal, into another language; from the image in the mind of an architect to a technical English description of the work. The true specification should be in course of preparation all the time that the design was being elaborated by the architect. The general description

of materials should govern the details of construction; and the work of preparing each should be simultaneous. The writing of a specification should be encouraged as part of a pupil's work during his articles, rather than the common course of education, which left the part of the art altogether to those who had passed through their period of apprenticeship. It seemed in some cases as if the architect-master of the present day followed the discipline of Pythagoras, who, it was said, expected a probation of five years from his pupils, and afterwards instructed them in the meaning of the enigmatical sayings in which he involved much of his doctrine. Before writing a specification its purpose should be fully considered. Much might be said, as regarded the order of treatment adopted, in favour of each of the following courses, the varied influence of which might frequently be traced:—(1) Giving directions as to general principles, leaving the details to the common sense and experience of the workman who have to carry them out; (2) following the order of the quantities, and, in fact, only supplying a running commentary upon them; (3) following the order of the execution of the work; and (4) following the order in which the work would be taken when measured. For the practice of specification-writing, perhaps the most important mental quality after patience, was decision, and the author considered that before writing a specification the mind should be made up as to the meaning and application of the following terms, about which there were varying opinions. Uniformity in the use of words and the avoidance of various terms meaning the same thing would also be of great assistance in making a specification intelligible. "Allow for" was a term which should not be used: it belonged to a bill of quantities and should show that the extent of the work was at the risk of the contractor. "Provide" was intelligible, if applied to quantities of materials and labour; if applied to sums of money, a very clear interpretation clause was needed. "Supply" if used in place of the usual "provide" increased the clearness of the specification, and avoided some prolixity. "Proper," before the introduction of work in imitation of Mediaeval structures, had an intelligible meaning, as applied to ledged doors, door-frames, &c., but was now safer to fully describe what was intended. "Sufficient" was a legal term which required breaking down so as to convey the intention of the writer; to describe the intention might save much trouble. "Best" had ceased to have any definite meaning through the introduction of the term "Best Best," "Double Best," and the like. "Prime cost" required explanation as to whether it was to be taken from the list price without trade allowances, without also discount for cash, and also whether it had to be increased by establishment charges, cartage, or fixing. There were few occasions for the use of "The Plan" which would not require some detail beyond the term. "Average" was a dangerous word, as it admitted of some of the work described being of less dimensions than were specified, and often nothing short of a measurement of the whole would clear up the doubts thrown on the execution of the work by foreman or clerk or works. "Sizes" should be explained as "out of" or "finished," and often at what time or in what position they were to be taken. Before "Attendance" was used the amount of labour and responsibility thrown on the contractor should be clearly explained, and the Employers' Liability Act should be understood; the delay occasioned by other tradesmen should also be considered. The application of the term "Reinstate" to disappointments was not considered by the author; to require a contractor to reinstate after accident, or after defects other than those of his own materials and labour, demanded a specially drawn specification; and it was sometimes better for the immediate use of the building to leave a small defect than to cut out the structure to pieces in order to insert new material in construction, if power were retained by the architect to charge for renewal, when an opportunity allowed of the work being executed. "Local Requirements" should be mastered before they were referred to in a specification. "Watchdog and Lighting" should be explained, whether for the contractor's own work or for other tradesmen, whether for night-work or for day only; the use of gas, firing, and special lighting varied in each case, and no general clause was in all cases sufficient. "Search for Old Drains" was some knowledge of where the old drains were was necessary before drawing the specification.





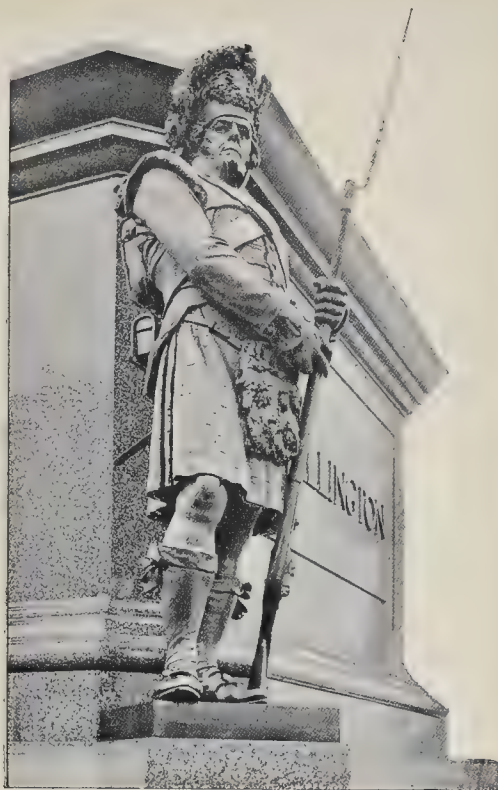


ANGLE FIGURES.



THE WELLINGTON MONUMENT, HYDE P

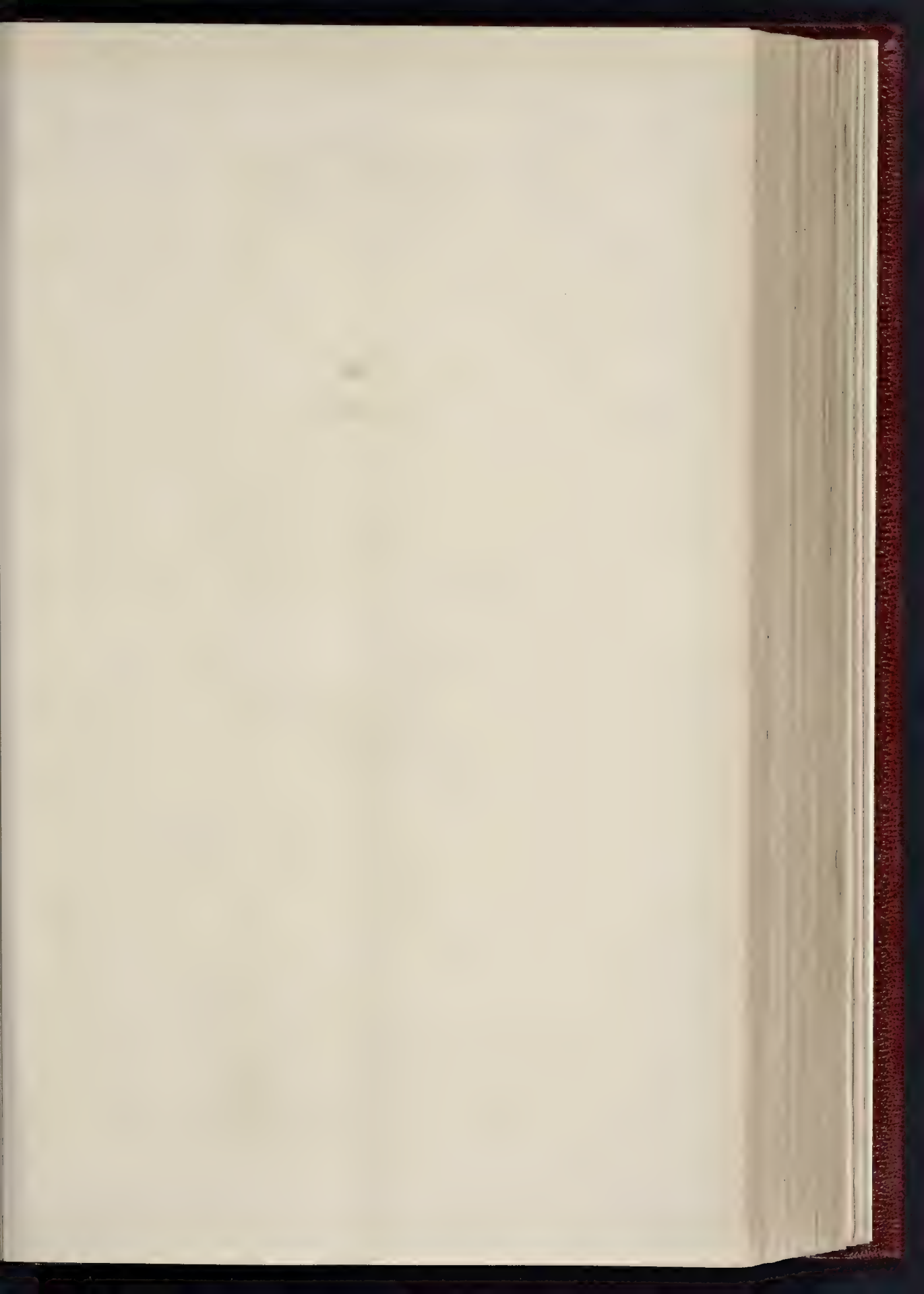




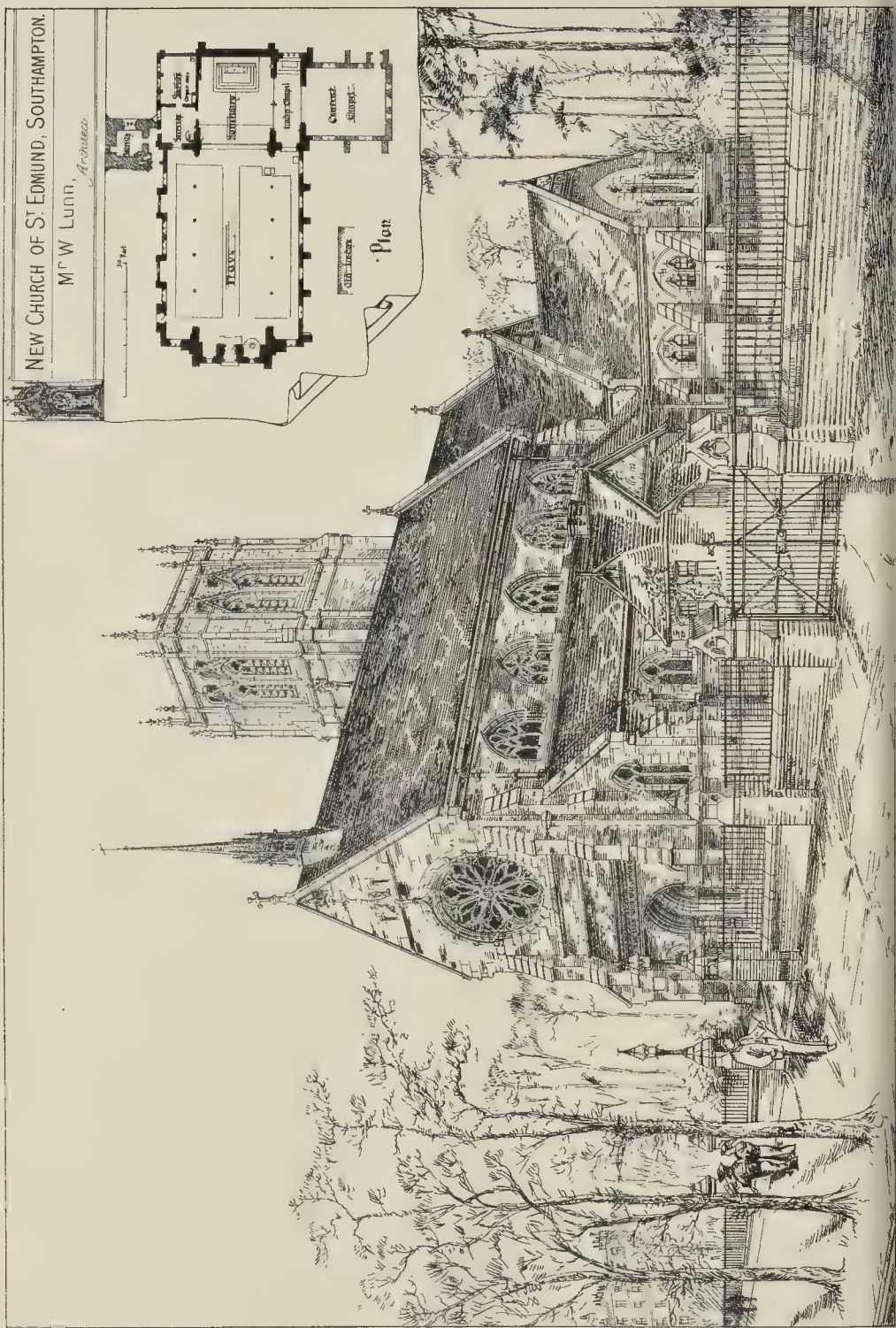
ANGLE FIGURES.



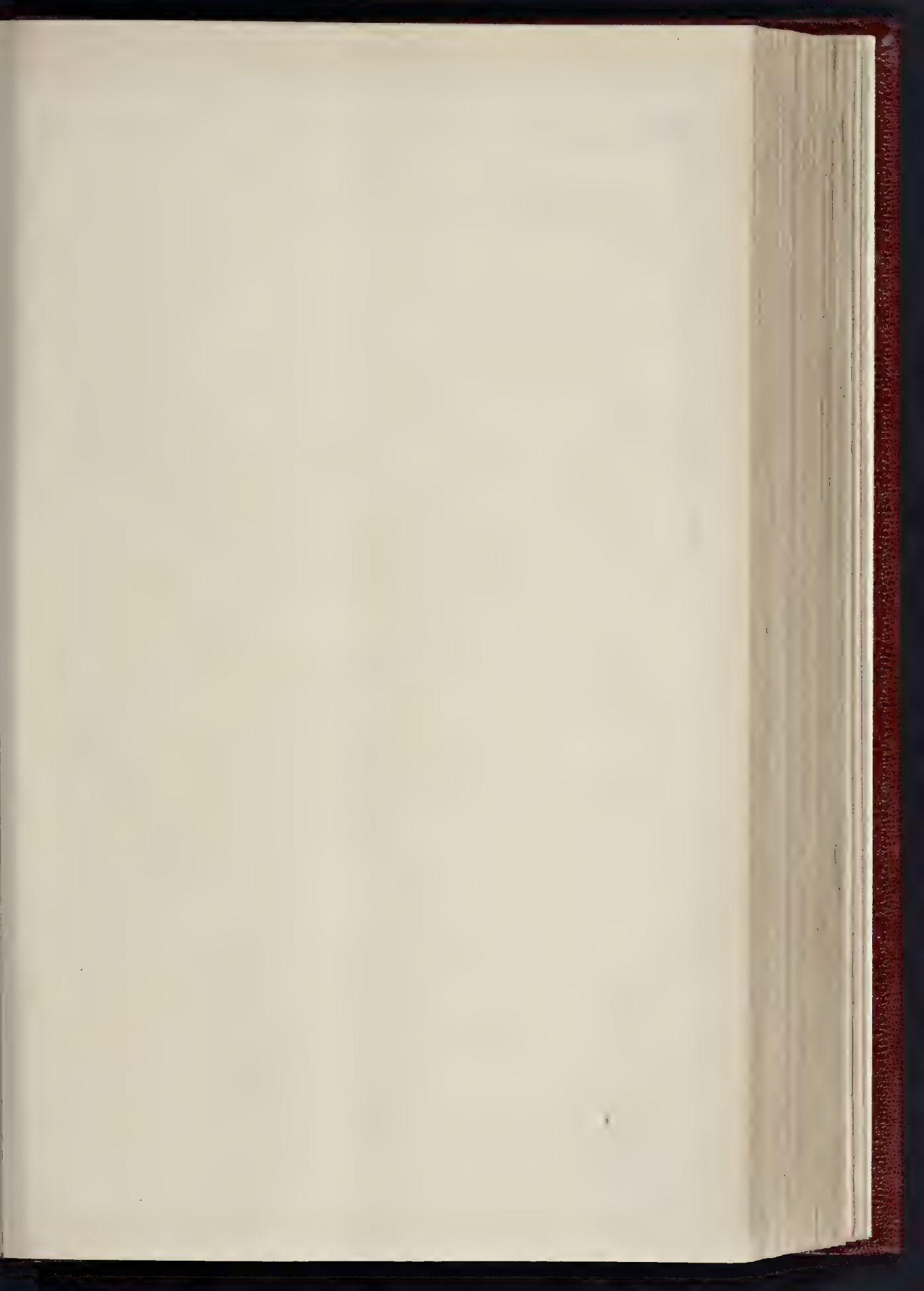


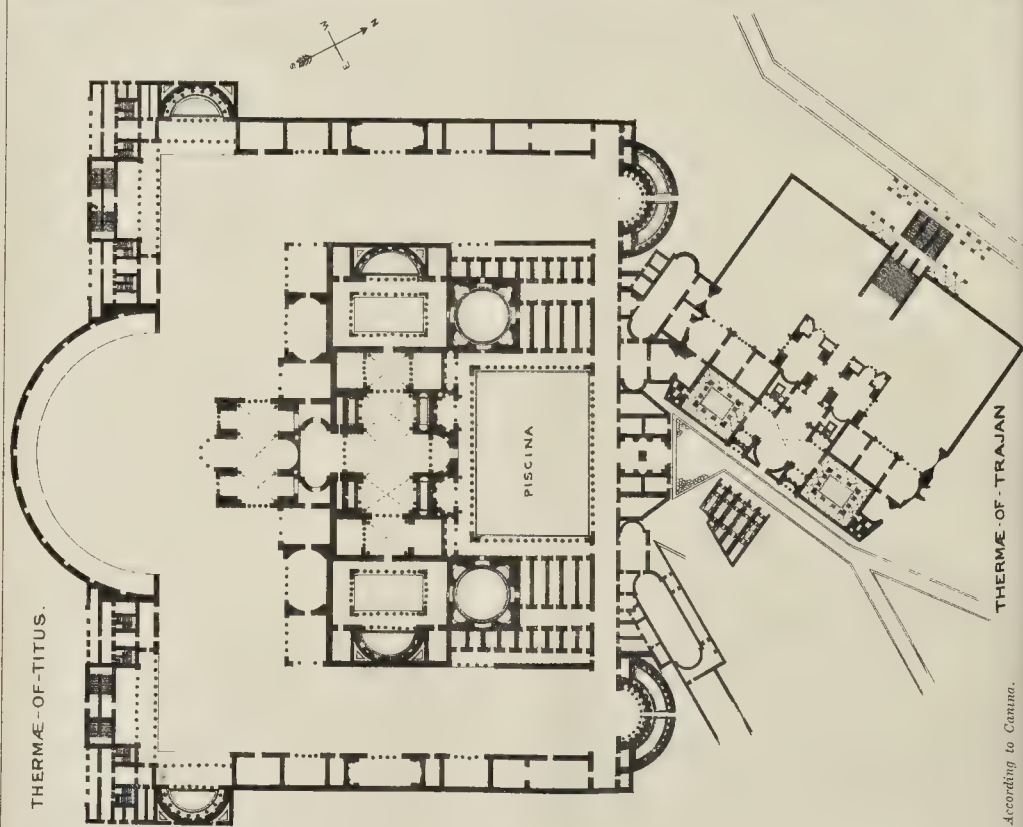


THE BUILDER, MARCH 2, 1889.

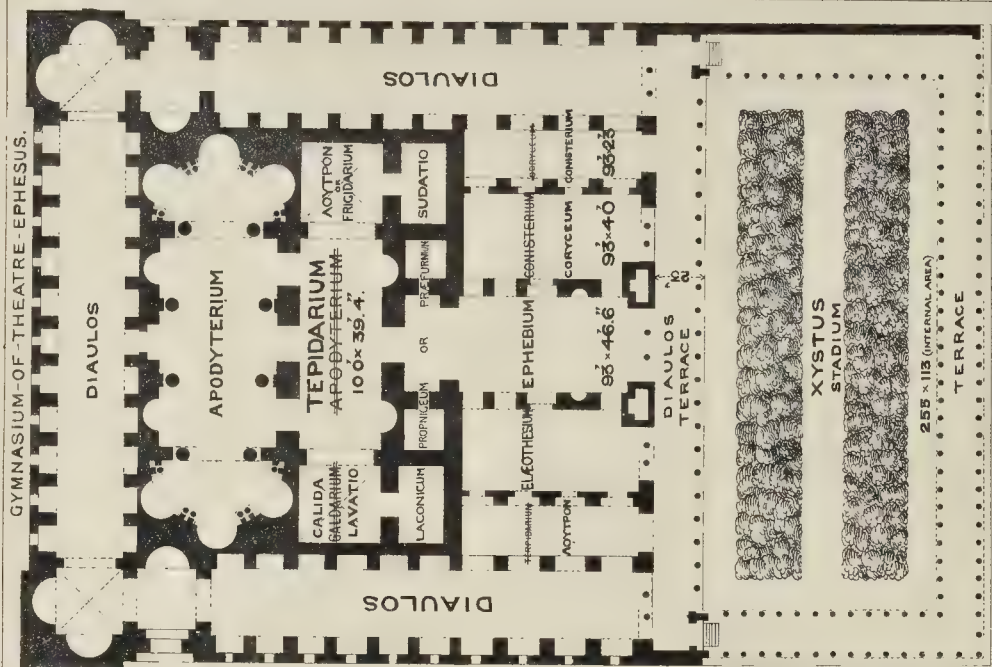








According to Canna:

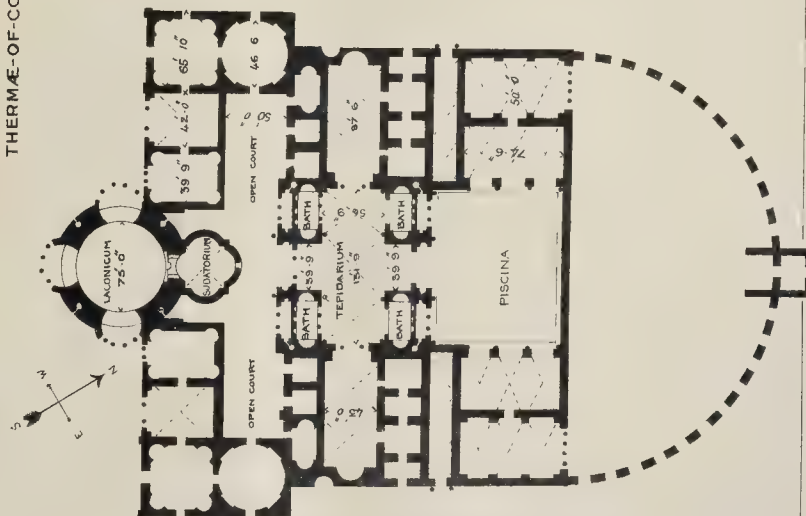


According to E. Falkener,

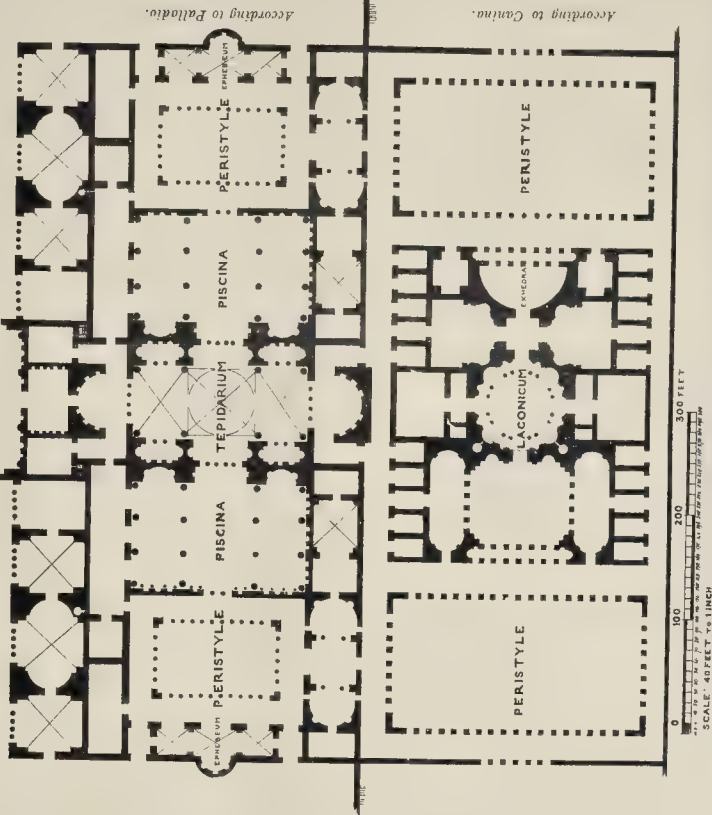




THERMÆ-OF-CONSTANTINE.



THERMÆ-OF-ACRIPPA.



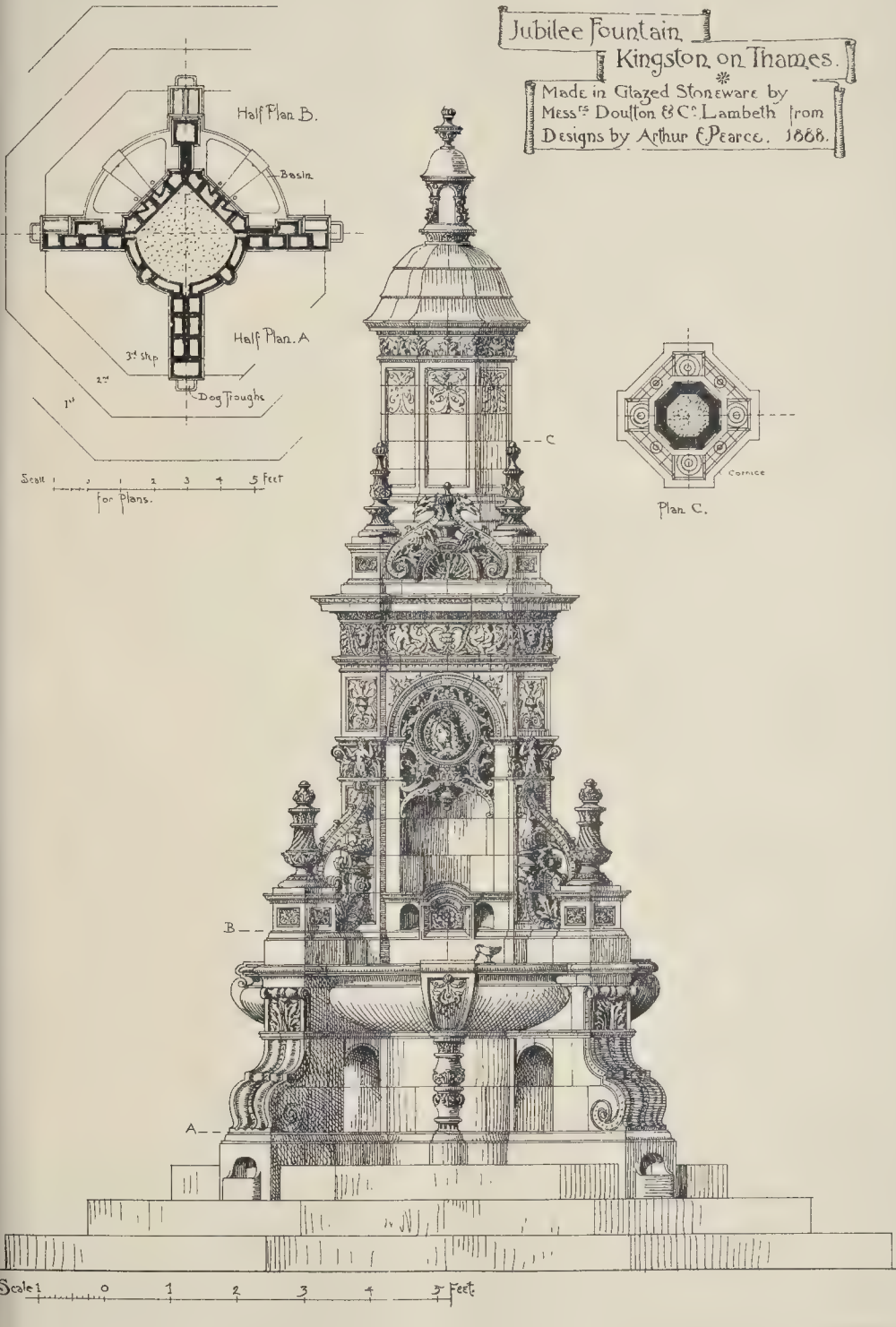
PLANS OF ROMAN THERMÆ.—IN ILLUSTRATION OF PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES.





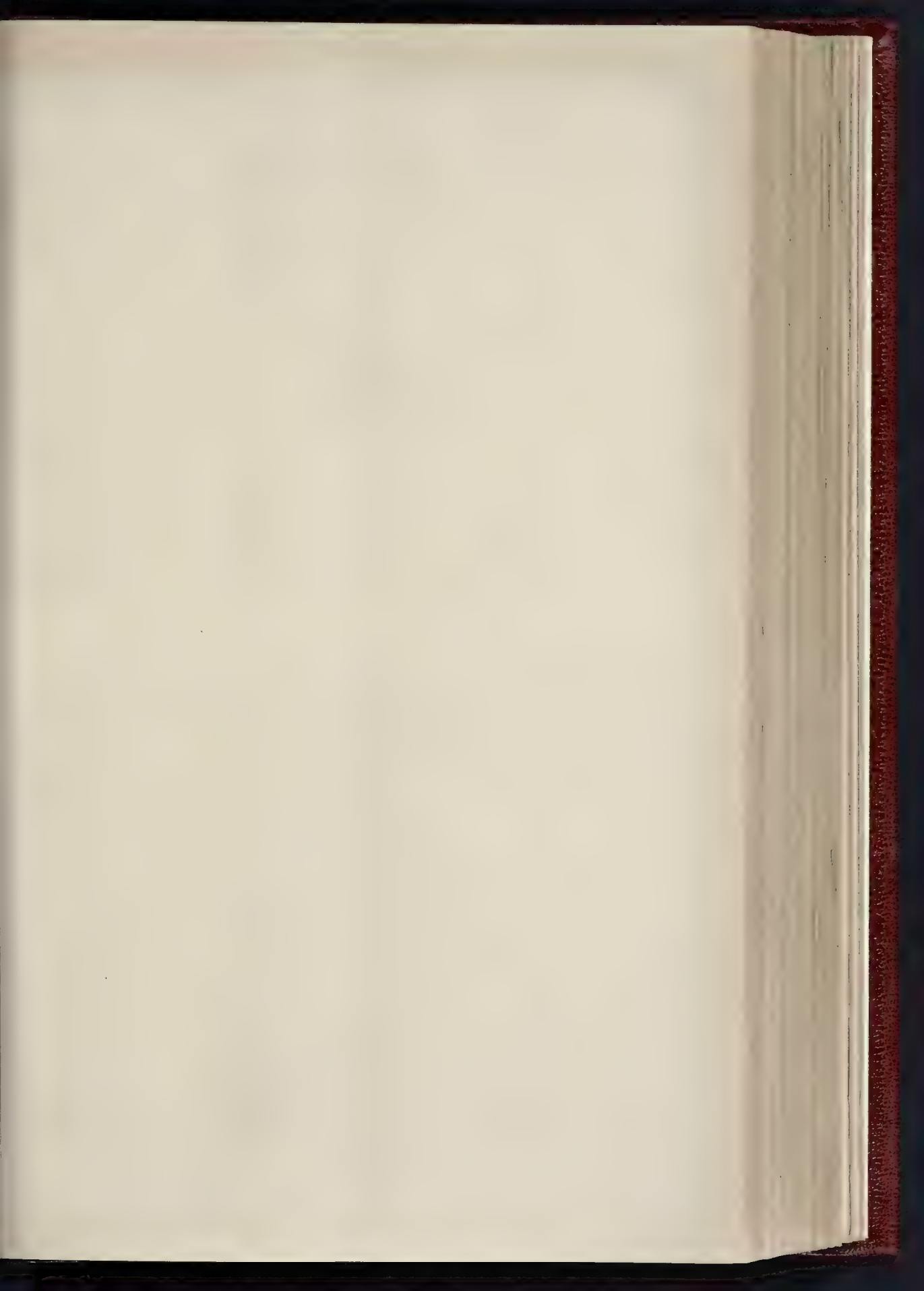
# Jubilee Fountain Kingston on Thames.

Made in Glazed Stoneware by  
Messrs Doulton & Co. Lambeth from  
Designs by Arthur C. Pearce. 1888.











RAKE STABLES.



RAKE MILL HOUSE.







DARBYN'S BROOK.



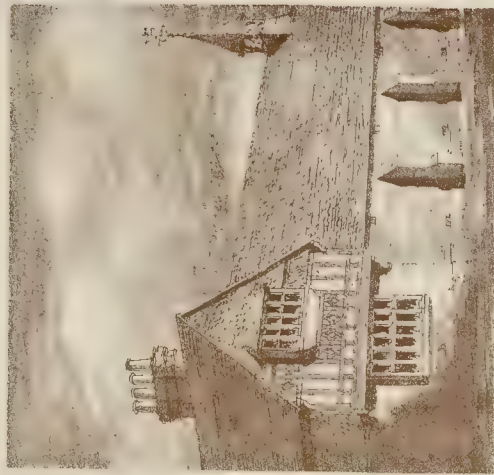
LITTLEFORD.



FARM STABLES



DARBYN'S BROOK.



FARM STABLES

WORKS NEAR GODALMING SURREY — Mr. RALPH NEVILL, F.S.A., ARCHTRECT.

THE BUILDING DESIGNED BY R. J. J. WATSON AND J. J. WATSON, ESQ., ARCHTRECT.





"Facilities" were to be afforded for inspection of work and for the introduction of other tradesmen for fittings during the progress of the contract, and it was only fair to define beforehand the extent to which this was to be carried, and the accommodation and responsibilities involved. If "Use of Scaffolding" was required for special purposes, or to be specially erected, attention should be drawn to the subject, as otherwise the ordinary words might carry only the use of scaffolding erected for the contractor's purposes, the extent of which varied greatly in different localities. The precise mode to be adopted in "Secret Fixing" should be clearly studied before writing the description. Before describing "Concrete," it was well to make up the mind whether absorbent or non-absorbent materials were to be used, whether burnt ballast was to be allowed or not, whether lime and cement might be mixed together, and whether the material should be shot into trenches from a height and left untouched under a penalty, or whether it was to be carefully laid without dropping, and then well punned. Would the architect approve of "Art Tiles" if winding and out of shape? or would he insist on having as good workmanship in their manufacture, without seconds, as he would have expected from Hollins or from Maw? "Rubbish and Debris" were both dangerous terms, but occasionally used; they were supposed to mean brickbats, waste-paper and night-soil should be specified out of them. If by "Asphalte" tar and sand was meant, it should be stated; if superior material in two thicknesses, the maker's name should be clearly specified. For "Flooring" the mind should be made up as to widths of boards, thicknesses, whether from the saw, the mill, or the plane, mode of fixing, quality, finish, and bearing. In "Ironmongery," the sets of hinges and the mastership should be decided on, and if P.C.'s were given they should be continued throughout. The tests required for "Cast" and "Wrought Iron" should be resolved in, and who was to pay for the testing made clear, whether the material passed the tests or not; whether Belgian iron was to be used or rejected should be decided on, and the cost of special rolls remembered. The capacity of the ordinary bricks should be studied for "Brick Facings"; every special mould required would delay the building so many days; whether all bricks were to be firsts, or any percentage of seconds allowed, should be clearly stated; and, as regards pointing, whether the kind described was likely to last if executed with the brickwork ought to be ascertained. London and Manchester interpret the term "Old English Bond" differently; which was to be used should be determined and made clear, and any bond it should be decided whether the perpends were really to be kept, and the necessary position of closers remembered. With reference to the term "Trapped," the gases of the recent day got through obstacles which in old times had been intended to stop rats; the water supply forced traps formerly approved; and he considered decision as to the form of a trap the strongest proof of professional influence. He mind should be made up as to what "Bonding or Cross-bonding" gave the better bond between stone and brick; it should be remembered that the average lengths on the two sides of a quoin-stone multiplied together did not give the average section of the stone quoin; and in what cases jamb-stones should bond within the face of wood frames ought to be stated. "Joggles": doubt should be ineliminable as to whether the material named was stone or cement, or as to the cases where the joggle ought not to be stopped. It could be decided whether "Scarfing" was to be described by a general rule or in detail; whether to be invariably bolted, and whether to be used at discretion. In "Fixing Lead-work," decision was necessary as to the use of lead seams or wooden rolls and other details; some cases a judicious reticence was safer in doubtful detail. As to "Drain Pipes," the new patented joints should be tried before being specified; the tests defined, whether made, water, or peppermint; the sizes stated, and the writer of the specification should be clear as to the construction of the bottoms of access chambers before binding the connectors as to the mode of execution, and also to which side of a trap the fresh air was intended to be introduced. When "Centric" was wished to be close-jointed, it should be stated. If the edges of "Plate Glass" were to be blacked, it should be noted. "Custom of Country" should be studied with reference

to stone facings, and the mode of pointing, slating, and tiling of all sorts, with bedding and torching appropriate. The selection of stones, and the appropriate treatment of each, was too large a subject for the author's present purpose. Among the many things likely to be forgotten might be mentioned:—The possible necessity of driving the planking of foundations; the application of a rule as to footings to piers and special cases; the liability to misinterpretation of the width of bed of a stone; the amount of labour carried by descriptions such as moulded, stopped, enriched, fitted, veneered, and the like; the accesses to cisterns, taps, and many other things; and the selection of sizes and shapes to suit the market for the several materials. The objects of a writer of specifications would be best gained if he first of all placed himself in the position of his client, but with his own better knowledge as to judicious expenditure; in the position of the builder, but with an art-knowledge which the builder might not have as to the materials available; and in the position of the clerk of works and foreman in having to obtain from the workmen intelligent labour.

The Chairman, at the close of the paper, said that with a good many architects the writing of specifications was thought to be a simple matter, and many, without years of experience, hardly appreciated the difficulty of expressing their meaning in terms which conveyed ideas clearly to those who wrote specifications from another point of view. He hoped there would be an animated discussion on the subject, because in days gone by there had been considerable difference of opinion between architects as to whether a specification should be treated in the elaborate manner which Mr. Rickman considered was the proper course. Some held that a general description of the qualities of the materials and workmanship, in rather vague terms sometimes, was the best way to deal with a specification, leaving the elaborate drawings, annotations, and descriptions to convey their meaning to the workmen. Even in that case there would arise a considerable difficulty in conveying the exact meaning to the workmen, and difficulties and omissions would continually arise. With the complete system advocated by Mr. Rickman those difficulties would be less likely to crop up, but the architect would have to be a many-sided man to be minutely acquainted with the details of every trade necessary to carry out his scheme. He would also probably receive great assistance from the draughtsman in his office, and from that now apparently indispensable adjunct to building works, the quantity surveyor, whose revision of the specification, after the process of taking out the quantities had been completed, would supply many minute details which the architect perhaps had overlooked. As to the necessity for patience, decision, and accuracy of language, there could be no doubt whatever. Of all things, the first qualification for an architect undoubtedly was patience (applause), after which, decision became an essential quality, one in which architects were sometimes wanting. Then, again, unless the architect had cultivated the habit of precision of language, which was intelligible in the sense in which it was meant, not only to himself but to those who read it, that decision would be of little value. Litigation in connexion with building matters arose frequently from looseness of expression. In that respect the paper was most important, as bringing home to architects, and those studying for the profession, the great importance of attaining that power of accurate expression by which alone they could avoid some of the pitfalls which had been indicated. Mr. Rickman's remarks upon "best" and "prime cost" were also of great value. Some years ago, when the term "best" began no longer to mean anything, but the worst, it was an ordinary practice to introduce at the head of specifications a declaration to the effect that the word "best" was intended to be used in its real sense, and no such travesty of the English language as "best best" would be entertained. In the present day, too, when the practice of employing special tradesmen was so general, it became important that the manner in which these were dealt with should be clearly expressed. The architect should, therefore, thoroughly make up his mind as to what would be the ultimate result, and the result between himself, the contractors, and the builders (applause).

Mr. E. T. Hall drew attention to a feature

which Mr. Rickman had not specially laid stress upon,—viz., the necessity which should be present in the architect's mind of making his specifications quite irrespective of the fact that quantities were to be taken out or not. If he set himself to work to do that, he would have a more perfect specification, and he would cultivate that which Mr. Rickman had laid stress upon,—namely, a habit of precision. If an architect did not know what he meant to do in the execution of a building, it was impossible that the clerk of works or the builder should know. Therefore, if he set to work and analysed the building from bottom to top, he would give the quantity surveyor less labour, and would possess himself of a knowledge of the building which the clerk of works and the builder's foreman could never have (applause). Mr. Rickman had drawn attention to the fact that specifications generally described what was to be done, and added that the suffering followed. The suffering here, however, was sometimes on the part of the client, and was usually followed by suffering on the part of the architect. Mr. Rickman had said that the writing of specifications should be encouraged as part of an architect's education, but he (the speaker) thought it could hardly be part of the pupil's work, as it required great experience, though the pupil might learn how to do it by being set to copy specifications, than which there could be no better education. With regard to loose expressions in specifications, of course there could be no justification whatever for them, leading as they always did to trouble, and being in every way most objectionable. As to details Mr. Rickman objected to the expression "Allow for" as a phrase which was indefinite, but there were in reality certain items which came under that description. Referring to the terms "best best" and "double best," these must have originated from a desire to assist the builder in evading the common-sense meaning of the term "best." The young architect who did not know all those particular terms ought not therefore to be made to suffer. As to the vexed question of "prime cost," he hoped that the Institute before long might see its way to have a definition of the term, which would prevent the trouble which had arisen. "Prime cost" should have but one meaning, namely, the first cost which the builder paid for the articles specified, and if it were clearly laid down that "prime cost" applied to the actual cost which the builder paid out of his own pocket, no injustice would be done to any one. With respect to the architect's knowledge of the Employers' Liability Act, he did not quite follow Mr. Rickman that that was an essential, because it was one of the responsibilities which the builder, in making his estimate, should contemplate. A common expression in specifications was that timber should be absolutely without sap, but in the case of timber for joists it was almost impossible that that should be so. Indeed, a trifling piece of sap on the edge of a joist had no materially prejudicial effect on the building, and it was simply reasonable that such a thing should be passed; but it was unreasonable that a clause should be inserted in the specification to the effect that no particle of sap should be in the timber. Watching and lighting in regard to the contractor could only apply to the work he had undertaken under the contract. As to searching for old drains, if they knew exactly where they were they would not use the expression "searching" for them (laughter). The architect should specify what he meant with regard to the term "asphalte." If he meant tar and sand he should say so. The best thing to do with regard to drain-pipes was to specify that they should be tested. When the pipes were laid the outlet should be blocked, and they should be filled with a charge of water, and if there was any flaw in the line of pipes, even as small as a pin-hole, the pressure would soon find it out, while if the drain stood that test they might be sure it was strong enough for all the work it would have to do. Mr. Hall concluded by proposing a hearty vote of thanks to Mr. Rickman for his very able paper (applause).

Professor T. Roger Smith said he thought the meeting had perhaps gone a little from the nature of specifications to the nature of the things which should be specified, while Mr. Rickman had tried to turn their thoughts to the somewhat difficult question of grasping exactly what a specification should be by telling them some of the qualities which went to the making



of it. At the same time, there were one or two matters Mr. Rickman had laid little stress upon. He had mentioned properly that a man should have patience and decision, but he (the speaker) was inclined to think it was equally important that he should have knowledge (laughter and applause). Unless a man knew thoroughly what materials the tradesmen would furnish him with; what would be expensive and what would be inefficient; what would be necessary for his purpose, and form the general scheme, he would be very much at sea when he came to write his specification. A man who was going to write a specification must furnish himself with knowledge, and he would even then find he had to get a good deal of special information for the preparation of individual specifications. Another essential quality was system. A man should, as far as possible, proceed on the same lines. He believed that a good, and, in many respects, valid specification, might be written comparatively short, describing things in somewhat general terms, but in that case it must not in any way go into particulars. On the other hand, if a man went into particulars, he ought to go equally into particulars in every part of his specification (applause). And he should lay down a system for himself, and adhere to it. Years ago, when special trades were done by various tradesmen, the object of the specification was to give each tradesman a description of that part of the work which fell to himself. Afterwards, however, came the very convenient mode of having one contractor to do every kind of work, and the specifications were then made into one volume. The curious thing was that they were going back to the old plan, and the chairman had pointed out that specifications existed even in which one-half of the contract-money was introduced in the shape of money provisions; which was simply going back to the individual tradesman. It looked as if they felt, to a certain extent, that they had gone a little too far, and that they were now getting more of the work done by separate tradesmen than was the custom a few years ago. The sole reason, almost, why it was desirable to include the various tradesmen, by the help of many provisions under one contract and specification, was to get the supervision and control over them that the general contractor exercised. When they came to look at so large a portion of the work being practically done without descriptions, the question arose whether they really wanted the descriptions in the specification, as directions for working, or for something else. If they were going to carry out work without a contract, whatever the specification practically said it was almost useless, and, if that were so, it was a point worth looking carefully at. It showed that they ought to have the question of the contract in their minds in writing specifications from beginning to end (applause). They ought to be such documents as would compel the contractor to carry them out in every way, and if so, the next thing that followed was that the nearer they ran to the quantities the better, because in all the work quantities were practically the basis from which the contractor formed the idea of what he would have to do. That seemed to show that those gentlemen who got the assistance of quantity surveyors, at any rate, to improve their specifications were not altogether unwise. The speaker concluded by seconding the vote of thanks, and by complimenting Mr. Rickman on the literary value he gave to subjects which in other hands would be comparatively prosaic, if not tedious (applause).

Mr. William White said that in former times it was a practice for contracts to be taken by different tradesmen, simply because the locality was often such as not to justify the existence at that time of a builder. That system might have its advantages, each man being interested in the work he had to do, and doing it personally. At the same time, there must be, in the present day, one responsible head for the whole of the work, in order to avoid the many disputes that would inevitably ensue. The architect ought to draw the specification for the surveyor as well as the contractor, instead of the surveyor drawing the specification for the architect (applause); and the surveyor detecting some little omissions which might have taken place in the description of the specifications, it was his privilege and duty to draw attention to them, and not simply to pass them over and let them go. He certainly thought there ought to be one first basis in writing a specification.

Mr. Lacy W. Ridge said the question as to the

definition of "prime cost" was certainly a difficult one. There were great advantages in these days in employing men who devoted their time specially to one particular branch of building, in such matters as fire-proof floors, lifts, or other things which required a good deal of special experience. Therefore, they should not draw out general conditions, and in the provisions they made they should be prepared to provide for them. As to the searching for drains, if the architect could not search for them before he drew his contract, how could the builder know what allowance should be made (applause)? Therefore, such a thing as searching for drains should be followed by a provision for money. He did not understand Professor Smith's idea of writing a specification in general terms, and where the object was to make a contract he did not see how the specification could be anything but full (applause). He agreed with Professor Smith's remark that knowledge was, after all, about as important a quality as could be brought to bear upon the work. Honestly, it was the architect's duty to know what he meant, and to say it in his specification (applause).

Mr. Henry Lovegrove expressed his admiration at the concise form in which the paper had been put together. He considered that if a rough general specification was supplied by the architect to the surveyor, the latter had a great inducement to follow the order of his quantities. It enabled him to compare the specification with the bills, and make them check each other. He agreed that the term "allow for" should not appear in a specification. The word "provide" should be used in the quantities, and it was better to give the number, weight, or quantity. It was quite certain the word "supply" would always meet the case. He agreed also that the word "fix" did not adequately represent what the architect meant. As to the term "prime cost," it seemed the one thing in the specification on which the architect and builder could never agree when the time for settling came. "Prime cost" should mean the money actually paid to the merchants by the builder, and his profit of 10 or 15 per cent. could be added to the amount. There was no doubt that in the rush and hurry of modern practice sufficient time was not given to the drawing up of specifications, and it was not a work which was practised by the ordinary architect.

Mr. W. H. Atkin Berry said that, as a young architect, he had experienced the greatest difficulty in dealing with the matter of "prime cost." Builders had architects very much in their power, and he hoped to hear some distinct expression of opinion on the subject. He was glad to hear it distinctly recognised that the specification was still to be regarded as the work of the architect, and not of the surveyor; for it had become the custom with many to look upon it as work to be delegated to the surveyor. The architect, he considered, should have as much control over his specification as over his drawings.

Professor Aitchison said he believed that most architects who knew their business could write a good specification, provided they had the time, but even when it was done in the best way, it appeared to him the architect generally was insufficiently paid for it (applause). The builder was naturally anxious to get as much out of it as he could, and the architect was the only person who probably gave away the larger portion of his time for nothing.

Mr. William Woodward contended that a specification should be drawn in such a way that, supposing the architect died, or the work was taken out of his hands, it, with the drawings, would be sufficient to enable the entire carrying out of the work on the original lines.

The vote of thanks was then put to the meeting and very heartily received.

Mr. Rickman, in his reply, said that the discussion had shown there were points in his paper which it would be well for them to study before they wrote a specification. Some of the speakers had suggested that the term "best" should be sufficient, but many architects did not mean to have the best things. The term "best" had sometimes a curious technical meaning, as in the case of glass, where it meant that it might have been selected four or five times. As to the general question of provisions, he had not gone into it on that occasion, as he did not consider it possible to compress what should be said on the subject into a paragraph in a paper on specifications. He understood, however, that the subject was to be discussed at the Institute

of Builders in the course of a few days,\* and it would be well if some architects were able to be present, and to take part in the discussion, so that they might understand the views of the builders in reference to the enormous number of provisions frequently brought into specifications. The one real difficulty in dealing with provisional sums was the payment through the contractor, and the client would often find it better to pay for many things direct than to pay for them through the hand of the contractor, who would necessarily pass the plane over them (laughter). He did not believe that a pupil who had been under five years in an office would be able to write a satisfactory specification. Professor Smith had said that the paper did not recommend knowledge; but the first requisite he had propounded was curiosity, by which he meant that desire to find out all about the different things which would enable one to get the necessary knowledge to write out a specification. The right way, of course, to draw up a specification was to assume that the architect, surveyor, and builder were all acting honestly (applause).

The Chairman announced that the next meeting would be held on March 11, when a special business meeting would take place for the election of the Royal Gold Medalist for 1889, followed by a business meeting to ballot for new members, &c.

The proceedings then terminated.

#### THE ENGLISH RENAISSANCE.

ST. PAUL'S is, of course, Wren's *magnus opus*. The present fabric was the outcome of several proposals, and the insistence of the clergy that he should adopt what was called the "Cathedral form." His first design was, as we know, more in the form of a Greek than a Latin cross, and the model of this is still preserved in the cathedral. This, however, and a modification, proving unsatisfactory to those concerned, he finally, as the compiler of the "Parentalia" quaintly puts it, "turned his thoughts to a cathedral form," by which, I presume, is meant the old Mediaeval model, but so altered as to reconcile, as near as possible, the Gothic to a "better manner of architecture." King Charles approved this design on May 1, 1675, and the first stone was laid on June 21 following, Wren being at that time in the forty-third year of his age. In ten years the walls of the choir and side aisles and the circular porches were finished, and the piers of the dome were also brought up to the same height. The first service was held in the new cathedral in 1685, twenty-three years after its foundation. The top stone of the lantern was laid by his son Christopher in 1710. Thus, in the comparatively short space of thirty-five years, the building was practically completed under the superintendence of one architect, by one principal mason, Mr. Strong, and during the occupation of the See by one Bishop of London, Dr. Henry Compton,—a wonderful contrast to the number of Popes, architects, and builders engaged in the completion of St. Peter's.

St. Paul's cost, in round numbers, about £750,000, was paid for principally out of the coal and wine dues, supplemented by voluntary contributions, and its architect was paid a salary of £200 a year. Allowing forty years for the time he was engaged on the work, this would give him £8,000, a little over one per cent. on the outlay; a truly magnificent remuneration for such services! It is interesting to compare St. Paul's with the contemporary church of the Invalides, the dome of which was begun by Jules Mansard in 1680, five years after St. Paul's, and finished in 1706, four years before the completion of the lantern of St. Paul's. The dome of the Invalides is 92 ft. in diameter, as against 108 ft., and is carried on four great arches, as against eight in St. Paul's; but internally it is lower in proportion to its diameter than St. Paul's, and in this respect probably better. Externally, the portico is two orders in the height, but there the resemblance to the English example ends, as neither in majesty of effect nor in dignity of style can the French church be at all compared to it.

I need not attempt to give you a description of the building itself. It is too well known to require this. In plan it is very pretty to look

\* See notice in our list of "Meetings" on p. 174 of this week's Builder.

Continuation of a Paper read by Mr. J. M. Brydson, F.R.I.B.A., before the Architectural Association on the 14th ult. (See p. 147, ante.)



at; but everything has been sacrificed to the "Cathedral form." For a domed church, the nave is too long and too narrow; the dome being so far off, its full effect is partly lost till one is close upon it. The breaking of the frieze and the architrave of the great order, to secure height for the nave arcade, and the introduction of an attic above it, seem to be grave errors. Then, again, to preserve an uninterrupted view down each aisle,—which is hardly ever seen,—the great piers of the dome are thinned down to the utmost; and the attempt to make all the eight arches look equal by mitring the archivolt only results in making them look weak.

The dome itself is too high for its width. The most satisfactory view, to my thinking, is across the transepts, and the finest bay of the nave that between the Morning Chapel and the Wellington Chapel. Notwithstanding all this, the whole interior is full of charming design. The lines are everywhere soft, flowing, and graceful, while the detail is always refined and elegant; the carving exquisite and full of spirit. The sweep of the dome above the whispering-gallery is truly magnificent, and even the four arches into the aisles are, in themselves, most picturesque bits of design. We see what an immense advance in regard to workmanship the style had made since the days of Jones,—the workmen had learned to interpret the letter as well as the spirit of the architect's intentions, and the national characteristics of the style had become even more distinctly marked.

Externally, St. Paul's, mu. more successful. The cupola rises from the body of the church in great majesty. The simple unbroken sweep of the peristyle on its plain base, from which the eye is easily carried down to the ground, secures for it a repose that is beyond all praise; indeed, we may claim that for dignity and elegance it has no rival anywhere, and especially is it far and away superior in this respect to St. Peter's. Again, however, it must be admitted that the employment of two orders, one over the other, resulting in two porticoes in the height in the west front, with one pediment doing duty for both, is most unsatisfactory, whilst it will never cease to be matter for regret that Wren did not boldly grapple with the problem of nave and aisles and clearstory, with the flying buttresses to support the nave vault, instead of erecting screen walls to hide the whole construction. Perhaps the exterior gained in simplicity by the treatment he has adopted, though one cannot but feel it is more or less of a sham, and that a great opportunity was thrown away. On the other hand, granted the two orders, nothing could be happier than the two western towers, considered either by themselves or in the general grouping with the dome and the rest of the church; for whatever point of view we take it, the effect is admirable, the most successful exterior of any Renaissance church in the world.

The mechanical skill and ingenuity displayed in its construction, and especially of the cupola, are in every respect most admirable, and worthy of the earnest study of every student. It is often said that Wren was a much greater engineer than architect; in his time there was no distinction, and in him we see a man who could construct scientifically and design artistically simply because he understood his work and how to express it.\*

Besides St. Paul's, Wren built some fifty churches after the fire. Let me only mention two or three. St. Stephen's, Walbrook, is famous for its interior,—which for its size is unsurpassed by any other church in Europe. It is a simple parallelogram, 22 ft. long by 89 ft. wide, with sixteen Corinthian columns so spaced as to produce the effect of a nave and aisles, with a central area covered by a dome, 45 ft. in diameter. Out of such simple elements, Wren has obtained one of his greatest successes in an interior full of elegance, admirable in proportion, and picturesque to a degree rarely ever found. I am sorry to add that this beautiful church has recently been "restored," internally, almost out of all knowledge.

Another fine interior is St. James, Piccadilly, famous also for the skilful carpentry of its roof. It is not much larger than St. Stephen's, being 86 ft. long by 87 ft. wide. It is divided into nave and aisles by a row of four columns on each side, the nave being covered with a barrel vault, and each bay of the aisles with side vaults opening out of it at right angles. Again out of

these simple elements a most charming and elegant interior is produced, much marred, however, by a hideous east window. This is a galleried church, and the galleries are skilfully worked into the construction, being supported by square piers, on which stand the columns carrying the vaults. The pity is that all this beauty should be enclosed in such an unworthy shell.

No notice of Wren's contributions to English Classic must forget his steeples. The steeple is a peculiarly national feature of this style, and Wren may be said to have invented it. His towers everywhere give a character to the City, and they are designed with rare skill for their sites. Witness that of Bow Church,—the finest of them all,—how well it stands on the ground, how picturesquely it groups from every point of view, especially up and down narrow Cheapside, though it is a thousand pities the loggia he designed for the street front of the church was never carried out. Old Bow Church, of historic and Dick Whittington memory, was generally regarded as the principal parish church in the City. It stood back from the street, and on the old site the present church is built. In order to get the steeple out to the line of the houses, a private house was purchased, and on this site the steeple is built. It may be interesting to know that in digging for the foundations an old Roman causeway was found 18 ft. below the surface. On this Wren built his tower, so that this bit of English Renaissance really stands on a Roman foundation. Another interesting historical incident about St. Mary-le-Bow. In old Medieval days there were tilts in Cheapside, and the king was wont to sit in a gallery near the church and watch them. When Wren built his steeple, to commemorate the old days of tilting and the Royal gallery, he placed a doorway with a little railed balcony overlooking Cheapside.

Bow Church was finished in 1677, and its great rival, St. Bride's, in 1680. It must be confessed Wren's later steeple is not equal to St. Mary's, at least in the spire part, which has somewhat the appearance of a drawn-out telescope. The monotony of the stages lacks the grace of form and play of light and shade of the Cheapside example. The interior, however, of St. Bride's is much finer than the other, which is commonplace to a degree. St. Bride's is another galleried church with a barrel-vaulted nave, though quite different in every respect from St. James, Piccadilly. Of a different type is the tower of St. Magnus, London Bridge, said to have been finished as late as 1705.

Besides his church work, Wren was employed on many large civil buildings. He followed Jones as architect for Greenwich Hospital. He built extensively both at Oxford and Cambridge, the Sheldonian Theatre at the former and Trinity College Library at the latter being among his best-known examples; also several of the City Halls.

He designed and carried out the extensive additions to Hampton Court Palace under William and Mary, including the Fountain Court, and what are known as the State Rooms. The garden front has a stately picturesqueness about it which is thoroughly English,—the simple quiet of its treatment and the homeliness of its material, red brick with stone dressings, amid the setting of its lovely garden, famous for its turf, combine to render it the beau-ideal of a Royal suburban retreat,—to my thinking much more interesting than the corresponding palace of the French kings at Versailles.

The seventeenth century was now drawing to a close, though Wren had still plenty of good work in him yet. His patron, Charles II., died in February, 1685, and was succeeded by James II., who in three years' time succumbed to the Revolution of 1688 and the advent of Mary and her Dutch husband, William,—afterwards William III., who reigned till the accession of Queen Anne, in 1702. It had been a wonderful century; the country had made immense advances in all that makes for the greatness of a nation. It was no longer a question of England and Scotland, but of Great Britain,—though the actual union by Act of Parliament did not take place till 1707, under Queen Anne. The East India Company had been incorporated, and made great progress in the formation of what ultimately became our Empire in the East. England's Colonial Empire had been founded by the settlements in the Carolinas and the New England States,—the beginning of that Greater Britain which has come to be such a

factor in the civilisation of the world. The party names of Whig and Tory came into use to distinguish the opposing Parliamentary factions. Our well-known English Bible had been translated and published as the authorised version. In literature we have the immortals Milton, and Bunyan, and Dryden; in Science the mighty Newton, and Harvey, and Flamsteed, the founding of the Royal Society and the Royal Observatory at Greenwich; in industries the establishment of the celebrated Spitalfields silk-weaving; and everywhere an enlarged and increasing commerce. Wars we had also in plenty, finishing with Marlborough's brilliant campaigns in Queen Anne's time, and the establishment of England's military prestige. Through sixty years of it all, Wren worked away at his architecture, now under one monarch, now under another. If he had his enemies, who were ready to prate against him on occasion, he had also his honours. He had been knighted by Charles II., he was M.A. of Oxford, and D.C.L. of both universities. He had been Professor of Astronomy and President of the Royal Society, and had sat in two Parliaments.

Wren, unlike Jones, never visited Italy to study the great works of the Italian Renaissance. Doubtless, had he done so, he would have gained greatly in artistic power. On the other hand, the loss of such an experience probably made him more self-reliant, led him to think out matters for himself, and, consequently, to originality of expression, and by that means may,—more than we are at first inclined to allow,—have helped forward that distinctive national character which pervades the English phase of the style. Wren was Jones's successor in the office of Surveyor-General of Public Works, from which, at the advanced age of eighty-six, and after fifty years of faithful service, he was dismissed in favour of a Court favourite, at the instance of a Court intrigue; to the everlasting disgrace of George I. and his ministers. He died in February, 1723, at the age of ninety-one, and was buried under the south aisle of his great cathedral. With the death of Wren may be said to have closed the Early English Renaissance, which had lasted about one hundred years. It had now become firmly established as the national style,—the vernacular of the country. With the advent of Vanburgh and Hawksmoor and Gibbs begins the later Renaissance. The reign of Queen Anne,—whose name has been taken so much in vain in the recent revival,—was the age of transition; an age also of great palaces, such as Blenheim and Castle Howard, and Grimsthorpe in Lincolnshire; and, notable for the development of the typical English plan of a great central block with curved wings or curved colonnades connecting it with side wings at their extremities, so as to form a great semicircular forecourt,—a type revived, by the way, by Messrs. Deane & Son in their competition design for the Imperial Institute.\*

The style up to the end of the seventeenth century was characterised by great vigour and picturesqueness, and by a freedom from restraint and an honesty of purpose not always to be found in the later Classic. The mouldings were well drawn and full of expression; not merely an arrangement of lines put together anyhow, as is too often the case with our latter-day Queen Anneists. A great school of carving had also been created, at the head of which stands the honoured name of Grinling Gibbons. Here, again, as in the case of the mouldings, there was great expression of purpose and vigour of execution, combined with a richness and grace which never degenerated into trivialities and meaningless scrolls.

I am fortunate this evening in having the use of Mr. Joseph Pennell's wonderful drawings of the old City Halls, built during the last half of the seventeenth century. An examination of them, particularly of the Brewers' and the Skinners' and the Girdlers' Halls, will show you better than any words of mine the character of the work I am so anxious to insist on. Look at the breadth of treatment, the power of drawing, and, above all, the picturesqueness, obtained often in the simplest and most natural manner. There is no straining after effect for effect's sake. Yet all this is as thoroughly English work as the best of our Gothic. Such Classic as this could never be found anywhere but in England. It would be as impossible to mistake this for French or Italian as to mistake Salisbury for Amiens, or Westminster for Notre

\* Illustrated in the *Builder* for July 16, 1887.

\* In no opinion rather at variance with the fact, but before noted, that Wren did not express the real flying buttress construction, but ignored it in the external design? —Ed.



Dame; and it is as distinctively national as the best work of any time in our country. Indeed, though some of its features and detail may be of foreign descent, just as our Norman and Early English Gothic, still under native hands they became so much acclimatised as to seem almost indigenous. Time will only permit me to mention a few instances of detail. The so-called Venetian window, a composition of three lights said to have been invented by Scamozzi, but which is so uncommon in Venice and so much the reverse in England as would almost lead the student to suppose that the former had imported it from the latter, where it is used in a dozen different varieties, and always with good effect. Then in doorways, what I may call the beautiful "shell-headed" type, of which we have so many charming examples, especially in woodwork. In details, what is known as the Ionic order may in this country be called the English Ionic. The treatment of the capital, with its wide-spreading volutes, used with or without the necking, and the little swags from volute to volute, flourishes here in its greatest luxuriance. In like manner also what is known as the Composite capital received a special development in England.

In the interior finishings and fittings of rooms, plaster and woodwork, but especially the latter, holds a prominent place. Panelling and staircases were everywhere important features. Look again, at the old City Halls and Ashburnham House; nowhere can you find such work as that out of England, or in it, of more thoroughly national character; the development of the same spirit in brickwork came later on. We must recognise that we are here in the presence of an English Classical style as truly the embodiment of the civilisation and the life of the people as any Gothic that ever existed,—a living, working, architectural reality, as much a part of England as its literature or its great school of painting, which it is as impossible to ignore as it was folly to forget,—the nearest to us in time and in similitude of requirements, a great mine of artistic wealth open to all who have eyes to see, hearts to appreciate, and understanding to apply to the necessities of our day.

I have taken up so much of your time with the rise and progress of the style during its great age, the seventeenth century, that I have little left in which to do justice to the later Classic of the eighteenth. I must ask you, therefore, to merely let me point out that, as in Italy, and in the case of our own Gothic, it somewhat declined from the high ideal of its more vigorous manhood; not that many excellent buildings, artistically considered, were not erected during the later period, but they as often as not lacked the purity and elegance of their predecessors. For instance, there came in with Gibbs and others what one might call the portico stage,—in which no building was thought to be complete without a portico, which, however beautiful in itself, was often sadly misapplied. There were something like 200 manor-houses erected in England,—many of them of vast size,—during the eighteenth century, one-half at least with porticoes. Porticoes also were often used in conjunction with features for which they had little sympathy; for example, Jones or Wren would never have been guilty of the incongruity of sticking a tower and spire on the top of a portico, as Gibbs has done at St. Martin's Church, and James at St. George's, Hanover-square. Even Hawksmoor knew better than that; when he built St. George's, Bloomsbury, he boldly put his tower to one side. Had Gibbs only done this at St. Martin's, say at the angle nearest Trafalgar-square, so as to carry the lines down to and stand firmly on the ground, this otherwise beautiful scheme might have been a formidable rival to that of Bow Church itself. Gibbs was more a slave to the orders. St. Martin's lacks height, especially internally,—all hampered by the order employed. Its low elliptical ceiling and vaulted aisles cannot for a moment compare with the similar treatment in St. James's, Piccadilly. Gibbs also built St. Mary-le-Strand, with its charming circular portico; though the tower is not so interesting as St. Martin's, it is better managed as far as its position goes. This is the church so much threatened of late. Its removal would be an irreparable loss to the picturesque of the Strand. Threatened men, they say, live long. Let us hope the proverb applies also to churches, and that this fine work may be long preserved to us. Gibbs was employed both at Cambridge and Oxford. At the latter he built the well-known Radcliffe Library,

between the years 1737 and 1747. The dome, 50 ft. in diameter, forms one of the principal features in all views of Oxford, materially enhancing the artistic effect of the scene. In itself the building is possessed of considerable merit, and looks more like the work of the Wren school than any of its contemporaries.

Gibbs also designed and built the Hospital of St. Bartholomew, and before I leave him let me pay a tribute to his honour in recording the fact that he did all this work at the great hospital as honorary architect, giving his services for the benefit of the charity. Any one who has gone through its vast wards, with their splendid staircases, and inspected the great room and the offices, and noticed the care with which it is all carried out, will admit that his generosity was only too amply bestowed.

Besides those I have mentioned, the other great names of the eighteenth century, which I can do little more than allude to, are Kent, who built the Horse Guards and the old Board of Trade offices; Dance, the architect of the Mansion House and Newgate; the brothers Adam, who introduced almost a style of their own, characterised by great delicacy in its ornament and general thinness and weakness of its Classical details. Lastly, the foremost architect of the latter half of the century, Sir William Chambers, the architect of Somerset House, and the author of the well-known "Treatise on the Decorative Part of Civil Architecture," in which he did for the literature of the English Renaissance what Vignola and Palladio had done for that of Italy. Of his great work at Somerset House I am unable to say anything to-night. It is well known as the work of an artist and a scholar, and one of the finest of our public buildings.

Sir William Chambers was one of the founders of the Royal Academy, instituted in 1768. He was its first treasurer, and Sir Joshua Reynolds its first President, and its first exhibition at Somerset House opened on May 1, 1780.

The mention of the Academy reminds me of a distinguished amateur of the eighteenth century, Richard Boyle, Earl of Burlington. He and his architect, Campbell, designed Burlington House, now the home of the Academy. On the screen you will find drawings showing what it was before the advent of that august body, and of the beautiful colonnade taken down to make room for the various quarters of the learned societies between it and Piccadilly. Alas! that the housing of all this art and science should have been accomplished at the sacrifice of so much that was beautiful in architecture, the mother of them all. Burlington House itself, one of the most refined and beautiful examples of English Classic, has been simply ruined by the addition of an extra storey of all proportion and sympathy with the old work below it, and by a dreadful half arcade half verandah, in front; while the splendid colonnade still lies going to wreck and ruin on the banks of the Thames at Battersea, a prey to every spoiler who chooses to heave half a brick at it,—and this for the accommodation and advancement of an Academy of Arts! Truly, the force of irony can no further go. It is simply a disgrace, and, I was about to add, could have happened nowhere but in England, till I remember that the Parisians burned down entirely their beautiful Hôtel de Ville.

Lord Burlington's name reminds me of a story of another eighteenth-century building, and of how things were done then, with which I must draw my occupation of your time to a close. When the City Fathers resolved in Common Council to build a new Mansion House for the Lord Mayor, a committee was appointed for conducting the business, consisting of the Lord Mayor, six Aldermen, and twelve Common Councilors, and many architectural designs were offered for their choice,—in fact, a kind of informal competition. Lord Burlington, zealous in the cause of the arts, sent down an original design of Palladio, worthy of its author, for their approbation and adoption. The first question in court was not whether this plan was proper, but whether this same Palladio was a freeman of the City or no. On this, great debates ensued, and it is hard to say how it might have gone had not a worthy deputy risen up and observed gravely that it was of little consequence to discuss the point, when it was notorious that Palladio was a Papist, and, of course, incapable. Lord Burlington's proposal was then rejected *non con.*, and the plan of a freeman and a shipwright, and above all a Protestant, named Dance, adopted in its room. The result was the present Mansion House, the

chief corner-stone of which was laid with much ceremony, and in the presence of the said Civic Committee, on October 25, 1789.

[For a report of the discussion which followed the reading of the paper, see *Builder*, p. 149, ante.]

#### ARCHITECTURAL SOCIETIES.

*Sheffield Society of Architects and Surveyors.*—At a meeting of this society, held in the School of Art on Tuesday evening, a paper was read by Mr. W. C. Fenton, entitled "Notes on Practical Sanitary Construction." Mr. Flockton presided, and there was a good attendance of members. The subject of the lecture was divided into two parts,—first, the sanitary construction of the dwelling; and second, the accessories for the proper cleansing and conveyance of the waste products of the dwelling and dweller. Mr. Fenton remarked on the great progress in sanitation during the last twenty or thirty years. The various Acts of Parliament relating to public health, culminating in the great Act of 1875, and the efforts of such eminent sanitarians as Sir R. Rawlinson, K.C.B., and Mr. E. Chadwick, C.B. (now in his nineteenth year), were referred to, and their influence shown. On the other hand, the diversity of legislative and administrative regulations was adversely criticised, and examples given where in one town strict sanitary regulations were enforced and in the next neglected, owing chiefly to the one town having local Acts of Parliament and the next mainly relying on the general Act, which did not give sufficient powers. Turning to the dwelling, the lecturer urged that greater attention should be given to the site with regard to the subsoil water, which had so great an effect on the health of the inhabitant, and instances were given which bore upon the importance of the question. The necessity for using only the best materials was strongly insisted on, and the proper quality and strength of bricks and stone were specified. The lecturer exhibited a table of tests taken of bricks made by different local manufacturers, which showed that while some bricks would only stand an average crushing strain of 19 tons, others would stand 55 tons, and one brick actually stood 67 tons before crushing. The greater use of hollow walls was recommended, both for dryness and the more equable temperature of the house. The importance of sufficient light for health was insisted on, and the necessary amount discussed. In the second part of his subject the lecturer referred to the mode of sewage disposal as involved in the question of water-closets and privies. The proper position, construction, and ventilation of water-closets were shown, and the best forms of apparatus described. The other sanitary fittings of the house, with the various forms of "traps" and "wastes" were alluded to, and instances given of bad arrangements to be found even in "good" houses. The lecture was illustrated by diagrams, showing good and other methods of drainage, &c., and by samples of sanitary earthenware fittings lent by Mr. J. B. Corrie and Messrs. T. Wragg & Sons.

*Edinburgh Architectural Association.*—The usual fortnightly meeting of this Association was held on the 21st inst., when a paper was read by Mr. W. D. McKay, R.S.A., on "The Rise of the Fine Arts in Scotland." In conclusion, the lecturer gave it as his opinion that Scottish art had never been in a healthier condition than during the last thirty years.—On Saturday last the members had their second excursion for the present session, visiting Lauriston Castle, Cramond Tower, and Barnton policies. The members were conducted by Mr. Thomas Ross, architect, Edinburgh. Lauriston Castle, which was first visited, has been greatly altered in modern times, but copies of pencil drawings by Claud Lattes were exhibited by Mr. Ross, showing the castle as it existed in 1799, and these show it to have been a quaint old Scottish house, with angle turrets and fine dormers, all of which still survive, but hemmed in with modern additions. On one of the dormer windows can be seen the initials of Archibald Napier, of Merchiston, and his wife, Dame Elizabeth Mowbray. They built the castle between the years 1587 and 1608. After an inspection of the castle and grounds, the party next proceeded to Cramond, to the remarkable tower there—all that now remains of what was once the palace of the Bishops of Dunkeld, who possessed the lands known as "Bishops' Karamond," as early as the twelfth century. The tower is a small structure about 24 ft.



square, and as it at present exists about 40 ft. high. It bears a considerable resemblance to the towers at Mugdock Castle. At the termination of the day's proceedings a hearty vote of thanks was accorded to the lecturer and to the proprietors of the places visited.

## BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

The twenty-second annual general meeting of the donors and subscribers of this institution took place on Monday evening last, at the offices, 21, New Bridge-street, E.C. The chair was occupied by the President, Mr. John Aird, M.P., supported by the retiring President (Mr. J. W. Hobbs, J.P.), Mr. E. Brooks, Treasurer; Messrs. E. C. Roe, J. B. Gammon, W. D. Gilbert, J. A. Robson, C. K. Purpin, B. C. Fox, G. C. Kentish, C. Brown, and other gentlemen.

Mr. H. J. Wheatley, the Secretary, read the report, which stated that the income for the past year had amounted to £680, 17s., and consisted of £82, 12s. in annual subscriptions, £264, 15s. in donations, and £594, 10s. in dividends. The expenditure was £460, 1s. 11d. (£369, 18s. 4d. being for pensions and temporary relief). Two elections had been held, the result being that Mr. E. L. A. Styles and Mr. E. Shaw had been elected to the pension-list. The number of pensioners now on the books is eighteen, and there are three children being educated and properly cared for at the Orphan Working School, per presentation at the Institution. The tenth annual dinner took place at the Holborn Restaurant on March 20, 1888, Mr. J. H. Hobbs, the President, in the chair, and, in answer to his spirited appeal, a sum of over £100, was announced in aid of the funds. During the year Mr. Edward Conder (acting Trustee) and Mr. Arthur Cates, retired from the trusteeship, the Committee warmly thanking them for their twenty-one years' service as Trustees. In consequence of these resignations, and of the death of Mr. E. B. Collins, some years since new Trustees had been elected, viz., Messrs. J. Howard Collins, J. B. Rider, and Wm. Robt. Freeman (Messrs. Mowlem & Co.). The following gentlemen, elected as Trustees at the foundation in 1866, still kindly maintain office, viz., Messrs. Geo. Samuel Pritchard, J. C. Anderson, and Charles Richardson. The Committee express their thanks to the hon. solicitors (Messrs. Paterson & Sons) for having prepared the necessary legal documents consequent on the changes in the trusteeship referred to. During the year a further sum of £300, had been invested, bringing up the total of invested funds to £3,350, Mr. Hobbs, on his retirement from the presidency, the Committee return their best thanks, especially as he so willingly served them when he had many urgent calls upon his time as Mayor of London. The Committee, in conclusion, express the belief that the present state of the Institution must be a source of gratification to all concerned. To Mr. Wm. Peto Ward, the founder (to whose unwearied efforts the very successful start made was greatly due); to the long succession of gentlemen who by year have served as Presidents, and to the donors and subscribers generally, the Committee tender their cordial thanks, and trustfully hope that the charity may ever prove a useful one to those who may need the assistance it affords.

The Chairman, in moving the adoption of the report, said that on this the first occasion of his residing he must congratulate the Institution on the care with which everything had been conducted, and upon the fact that so much benefit had resulted to those who unfortunately needed assistance. Great economy had been exercised in working arrangements, and he was glad to find that after doing much good the Institution had yet been able to add to its capital during the past year. He did not think it needful to say more on the excellence of its management, but he hoped, in the Dinner, to follow the good example set by those who had gone before him, and to endeavour all means in his power so to advocate the claims the Institution, with a view to strengthen its funds, as to enable the committee to continue to do good work it had before it. To assist in this would be a great source of pleasure to him, and he felt it as a compliment to have been asked to assist in any way in helping forward as good a charity (applause). Mr. Aird concluded by moving a first resolution, viz., that the report, &c., be accepted, and printed with the list of subscribers and rules of the Institution.

Mr. E. B. Gammon seconded the motion, which was carried unanimously.

Mr. E. C. Roe then moved a vote of thanks to the retiring officers. Mr. A. Stanger seconded, and was also carried unanimously.

The new officers were then elected, and a vote of thanks to the Chairman closed the proceedings.

**Lectures at Carpenters' Hall.**—A report of Professor Baldwin Brown's lecture on "English Architecture of the Eighteenth Century" is in the issue, but crowded out this week.

## THE PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS: ANNUAL DINNER.

The annual dinner of this excellent and old-established institution was held at the Holborn Restaurant on Saturday last, when 335 members and friends of the institution sat down to table. Mr. Samuel Knight, F.R.I.B.A., was in the chair, supported by Mr. Alexander Ritchie (of the firm of Steven Bros. & Co.), Mr. J. P. Strudwick, Mr. H. P. Monckton, and several other visitors. The usual loyal and patriotic toasts having been proposed from the chair (Mr. T. W. Heath suitably responding for "The Army Navy and Reserve Forces"),

The Chairman proposed the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works." He said he was in entire sympathy with the Builders' Foremen and Clerks of Works Institution. He had been in the active pursuit of his profession as an architect for the last twenty-five years, and during that time had been intimately connected with builders' foremen and clerks of works, and he considered that architects generally were largely indebted to them for their assistance. As regards the Institution itself, it was, he believed, the oldest of its kind, having been established in the year 1842, and was thus in the forty-seventh year of its existence. The object of the Institution was to provide a fund for the assistance of men who were rendered unfit for work through ill-health or old age, and also to widows of members. A large amount had been paid as grants to members of the Institution during the year it had been in operation, the total expenditure being something like £7,000, and considering the small number of members, the result was very laudable and praiseworthy. He called attention to the fact that there was over £5,000, invested in the funds; but he could not give the members of the Institution entire praise, for although there were more than 300 persons present that evening, there were only seventy-two subscribing members. He expressed a hope that many of those present would decide to join the Institution, and that before another year had passed the number of subscribing members would be doubled. It was perfectly idle to suppose that seventy-two members was anything like a representation of the number of members who ought to belong to their Institution—(hear, hear)—and he wished them to remember that in doubling their numbers they would be doubling their funds. The funds of the Institution were administered in a most economical manner, and he called attention to clause 17 of the rules and regulations, which showed the modest scale of remuneration to the officers. In conclusion, he mentioned that £322, 3s. had been expended in grants and pensions during the past year (applause). The toast, which was received with acclamation, was coupled with the name of the Secretary, Mr. J. W. H. Bedford, who in response said that one of the reasons why their number was small was that a man must be over forty-five years of age before he could belong to the Institution.

The next toast was "The Governor and Trustees," which was proposed by Mr. J. Merfield, who spoke in high terms of the Governor (Mr. George Plunkett, J.P.).

Mr. Bedford replied on behalf of the Governor and Trustees. It was only ill-health that prevented the Governor being present that evening. Mr. F. J. Dove and Mr. Scrivener (two of the Trustees) were also unable to be present.

Mr. E. Groome humorously proposed the toast of "The Donors and Honorary Subscribers," and remarked that theirs was the only benevolent institution of its kind. The toast was coupled with the name of Mr. R. Adams, who responded.

Mr. Alexander Ritchie next gave "The Architects and Surveyors." He said they were in no small degree indebted to architects for the magnificent buildings which had been erected both in London and the country. The toast, which was well received, was coupled with the names of Mr. H. Percy Monckton and Mr. J. P. Strudwick.

Mr. Monckton, in replying on behalf of the architects, said they could not work without the assistance of the manufacturers, nor without the builders' foremen and clerks of works. Nothing could be done alone in this world, and his experience was that builders' foremen and clerks of works had always endeavoured to please architects, and had the same spirit in their work as the architects themselves.

Mr. Strudwick replied for the surveyors. He said the definition of the difference between an architect and surveyor would take too long to explain, but in one word the architect was an art man, and the surveyor a man of figures and dry, matter-of-fact information.

The Chairman next proposed the toast of "The Builders." Much had been said about the merits of clerks of works and builders' foremen, but by no means was it to be supposed that they could carry out the architect's design without the builder. No one was more sensible of the eminent assistance which was rendered by the builders to the architects in carrying out their work than he was. All the resources and energy requisite to carry out the architect's designs was supplied by the builders,

and without them, many of the buildings referred to by Mr. Ritchie would never have been erected. The first duty of the architect was planning and construction; from that the superstructure was raised, which could not be done without the aid of the builder. In conclusion, the Chairman referred in eulogistical terms to the firm of Messrs. Mowlem, Bury & Co., and the toast was coupled with the name of Mr. George Burt, who, in responding, said that he should like to see the builders' foremen and clerks of works themselves more strongly represented on the list of supporters of the Institution. Mr. Crickmay next proposed "The Press," associated with the name of the representative of the *Builder*, who responded; and Mr. J. Stapleton gave "The Visitors," coupled with the name of Mr. J. Aldorff, Messrs. Chubb & Sons' representative.

Mr. Bennett next gave "The Chairman," who, in reply, said he wished to impress upon them that architecture was the chief of all arts and sciences, for it had to provide the structures wherein all other arts were housed. All workmen ought to take an interest in the building they were engaged upon, and ought to be taken more into the confidence by the architect, which, he was sorry to say, was not the case.

Mr. Carpenter (Clerk of Works to the Bank of England) proposed "The Officers of the Institution," and Mr. G. Ross replied. The total amount of subscriptions received during the evening amounted to upwards of £71.

## CASES UNDER THE METROPOLITAN BUILDING ACT:

### NEGLECT TO GIVE NOTICE TO DISTRICT SURVEYOR.

MR. H. ROFFEY, a builder, was summoned by Mr. T. W. Willis, District Surveyor of Putney and Roehampton, at the Wandsworth Police Court, on the 13th ult., before Mr. Curtis Bennett, under the 37th Section of the Building Act, for not giving notice to the District Surveyor two days before commencement of the erection of a building; and further, for erecting a building with other than incombustible materials.

Mr. Reeve appeared for the District Surveyor, the builder being represented by counsel. After a long argument, in which counsel contended that, the building in question, being so constructed as to be easily removable, and intended for temporary purposes, the District Surveyor was not entitled to notice, the magistrate decided in favour of the District Surveyor, and imposed a penalty of £1, together with 17s. 6d. costs.

In the second summons the District Surveyor stated that the building in question was intended to be used as a billiard-room. It measured 24 ft. by 18 ft., and was constructed with wooden framing, boarded inside and out, the roof being covered with felt. It appeared that the District Surveyor gave notice for the removal of the structure, or, as an alternative, its construction in accordance with the provisions of the Building Act. The owner, Mr. Walter Emden, refused to allow the builder to comply with the notice, but stated that he was willing to coat the woodwork with "Ignifuge" paint. The magistrate decided in favour of the District Surveyor, but consented to the adjournment of the case for one month, to give the owner the opportunity of making application to the Metropolitan Board of Works for the retention of the building.

## THE WOOD-WORK OF HADDON HALL.

SIR.—The historic account of Haddon Hall published in your issue of January 12, illustrated as it was by a series of admirable sketches, deserves the gratitude of all lovers of the Old England of which it treats. No more interesting series of sketches has yet been added to the many published drawings and paintings of Haddon Hall. Every portion of that stately mansion has its share in your description,—notably the long southern gallery, or "ball-room," which overlooks the terraced garden.

The wood-work of this beautiful room is one of the finest examples of the Elizabethan, or mixed, style which prevailed from the middle of the sixteenth century to the days of Inigo Jones, the counterpart of that spirited carved paneling, with pilasters, inlaid with fillets of ebony or stained pear-wood, cornices, heraldic devices, and placed crests, which distinguished the Flemish wood-work of that age, specimens of which, in the shape of press-fronts, dressers, and other details, found their way down the canals of the Low Countries from Bruges, Malines, and other towns, into this country, to be completed by local carvers and carpenters.

The panelling of this long room is of oak, as that species of timber was abundant in former days on most estates in England. The whole surface has been, at some period, washed over with a light distemper coat, once probably white, now ash grey, over which the workman has laid a sort of graining of foxy red, now faded. This graining is not done by ingenious combings, wipings-out of veins, &c., in the modern manner. It has been dashed on by a rapid stroke of a broad washing-brush, spread out with the fingers, beginning from the bottom of the panel, carried up to the top round, and down again.



At first sight one might suppose it to have represented sweet cedar, then a rare wood. It differs from the more careful solid painting in oil, with pickings-out of gold, which decorates the panels of some other rooms in the house, and has every appearance of a rapid freshening-up for some festive occasion,—a marriage, coming-of-age, birth of an heir, or the like.

The hue of the entire panelling of the gallery is faded now. On a general survey it resembles old oak, dry, powdery,—like the surfaces of church- chests, granary corn-bins, church roofs, &c. It is to be noted that the timber roofs and panels of halls in which constant fires have burned, and from which smoke has escaped down wide, windy chimneys, have grown not grey, like that of churches, but brown, even to blackness, owing to this smoke hanging like a grey cloud above the room.

I am led to these remarks on the condition of the gallery panelling as now seen because a rather sharp controversy relating to the subject was carried on in the columns of the *Athenæum* during the autumn of last year. The facts which gave rise to it are these:—A tourist obtained permission to scrape a small portion of a panel in some part of the gallery where it would not be noticed, in order to assure himself that the wood of the panelling was oak. The village carpenter would have made this quite clear by showing him the grain of the first panel before which he chose to stop. The wash on the wood is so slight that the minute cavities of the grain are not filled up, and it is discernible to any one familiar with the surface of planed oak. The leave was, however, kindly given, and advantage has been taken of it not to scrape only (but to paint) a considerable section of the room, including one of the doors, with boiled oil,—a muddy, chocolate-coloured substance, opaque as mock-turtle soup, that now hangs in waves and garlands on the surface, and has stained and defiled the fine old oak floor below.

The curiosity-shops of London stain and varnish new oak furniture to suit the demand of "old oak" cabinets and tables, but if they take artificial means to meet popular persuasions on this point, they do not clog the surface with such an unguent as boiled oil.

Sightseers will sometimes see antiquity only through spectacles of their own, as foreign romances see ourselves in some grotesque disguise suited to the preconceived notions of their readers. But Haddon Hall is too venerable to be clothed in greasy modern fustian. The family to whom it belongs have preserved it with great care, constant cost, and a genuine desire to keep for us one of those homes of old English hospitality, and that feudal attachment of rich and poor to each other, which are the best and noblest traditions of old rural life.

The Hall has survived under peculiar circumstances, unchanged by the fashions of the Hanoverian Dynasty. Not buried, like Pompeii, but fenced from wind and rain, its lead, stones, and timber secured against decay.

What personally (or otherwise) conducted tourists would propose to put a new nose on the Egyptian Sphinx, to varnish the frescoes of Pompeii, or to sandpaper the bas-reliefs of the Parthenon?

Haddon Hall would need some changes to fit it for the family residence, but while it is open to all visitors it is the veritable home of artists. They are trusted guests, go where they like, stay, paint, draw where they please. The shadows steal along the deserted floor from west to east; but for them these old rooms, once peopled by generations of sons and daughters who played and danced over the boards, are neither too lonely nor too grey. The ashy hue, the crust of age, the patina which time has laid over the surface of most things at Haddon, are its most attractive decorations. The boiled-oil will be gradually washed off with alkali, and the old colour will be restored as far as may be by that process. Sightseers have learned to keep pencils for sketch-books, and to leave diamond rings on the fingers of their sweetheart, instead of scribbling their names on walls, or scratching tender sentiments on glass panes. Let them accept Haddon Hall, hoary and old, but still strong and solid, for what it is, and make no effort to change it for the Wardour-street buxom of to-day.

11, Pembroke-crescent, W. J. H. POLLEN.

#### MR. JOHN HONEYMAN ON THE MASONS OF GLASGOW CATHEDRAL.

SIR.—On page 130, Mr. Honeyman, F.R.I.B.A., says:—"The choir of Glasgow Cathedral bore internal evidence that it was designed from base to parapet by one man, and that very little more was left to the discretion of the thirteenth-century mason than they were in the habit of leaving to the masons of the nineteenth century." This does not exactly agree with the pretensions of the Freemasons, but it may be quite true for all that. It is very curious that in Glasgow, while the Incorporation of Masons there has existed at least from the year 1600 A.D. till now, there was no deacon-convenor elected from the Masons until the present century. What is the explanation of this? Were the seven-teenth and eighteenth-century masons all nobodies,

or had they so exhausted their energies at the cathedral work that it required more than two centuries for them to come abreast of the other trades in the city?

It was to support the pretensions of the old Glasgow masons that the notorious Malcolm Canmore forged charter was "discovered" about the beginning of this century, and in virtue of which the lodge held its 831st (!) anniversary in December last. If the Masons cannot bring forward better evidence than this that they were the architects, as well as the builders, of the Cathedral, their title to the honour is but small.—I am, &c.,

W. P. BUCHAN.

### The Student's Column.

#### TOWN DRAINAGE.

##### IX.—INCLINATION OF HOUSE DRAINS.

THE desirability of a rapid fall in house drains is not so great as is sometimes supposed. "Give it all the fall you can" is sometimes said to workmen laying a drain when no arrangements have been made for supervision, and the proper inclination of each part of the drain has not been previously determined. But without unnecessarily supposing that a drain be laid in this careless way, and taking it for granted that there will be proper supervision of the work, the drain need only have such a rate of fall as will carry off the sewage and the greatest quantity of rain-water coming into it; and with regard to the sewage alone, a moderate fall is better than a rapid one. The comparatively short length of any house drain makes it impossible for sewage to remain long on the premises when the joints are water-tight, and when the ordinary quantity of waste-water from a house is discharged into it; and with regard to jointing, we must in all cases suppose that the joints will be made water-tight. Unless that can be granted nothing further of any use can be said; and we must say that this applies not only to the horizontal portion of a drain but to all vertical pipes, including the soil-pipes of water-closets, the joints of which must be made air-tight. We are not at present concerned with these, but it would be absurd to suppose that the joints of these either cannot or will not be made air-tight. There is nothing whatever to prevent it, in the nature of the case, in the materials used, or in the time required and allowed to enable a workman to make them so. The English workman cannot, any more than he of any other nation, make a good thing without good materials and a sufficient time, but with these there is no occasion for the exercise of ingenuity in devising means of circumventing the supposed carelessness of the workman. The carelessness which does exist is, unfortunately, more often on the part of those who employ him.

If a fall be given to the drain corresponding with a sufficient velocity of the sewage during some part of every day by the ordinary discharge of the waste-water, that is better than a fall so rapid as to cause the water to run away from the solid parts of the sewage. The liquid should carry the solid with it, and if it do so, the time occupied in its transit to the sewer will in no case be of much importance. At certain times of the day the discharge of waste-water from houses is greater than the average run of the twenty-four hours, and at these times,—say twice a day, forenoon and evening,—the depth of water maintained for about a minute in a 6-in. pipe, laid with an inclination of 1 in 60, is sufficient to carry the solid part of the sewage with it, and to free the drain from the deposit which takes place at other times of the day during which a less quantity of water is being discharged. If the fall be greater, the velocity of any one bulk of water discharged into the drain will be greater at first, but the depth soon becomes reduced below that which is sufficient to carry all parts of the sewage with it, and as a velocity of 2 ft. or 2 ft. 6 in. per second in a 6-in. glazed earthenware pipe carrying a depth of sewage of 1 in. or 1½ in. is sufficient, it is better, for the special purpose of a house-drain, to maintain that depth and velocity rather than endeavour to acquire a greater velocity by means of a greater rate of fall, with the result of reducing the depth. The following small table exhibits the rate of flow at various depths in a 6-in. pipe at the two inclinations of 1 in 30 and 1 in 60.

| Depth. | Inclination. | 6 in. Pipe. |                      | Quantity discharged per minute. |
|--------|--------------|-------------|----------------------|---------------------------------|
|        |              | Feet.       | Velocity per second. |                                 |
| Ins.   |              |             |                      |                                 |
| 1      | 1 in 60      | 2.69        | .....                | 3.46                            |
|        | 1 in 30      | 3.81        | .....                | 4.89                            |
| 1½     | 1 in 60      | 3.26        | .....                | 7.52                            |
|        | 1 in 30      | 4.62        | .....                | 11.64                           |
| 2      | 1 in 60      | 3.67        | .....                | 12.59                           |
|        | 1 in 30      | 5.20        | .....                | 17.94                           |
| 2½     | 1 in 60      | 4.02        | .....                | 18.62                           |
|        | 1 in 30      | 5.68        | .....                | 26.31                           |
| 3      | 1 in 60      | 4.26        | .....                | 25.10                           |
|        | 1 in 30      | 6.03        | .....                | 35.52                           |

But although it is desirable to limit the fall with the object of maintaining a greater depth of sewage in the drain, regard must be had to the rainfall coming into it. This varies with the area of the paved surface at the back of the house. The separation of rainfall from sewage, with the view to lessen the difficulties of dealing with the sewage at the outfall, should be effected to the utmost extent practicable in every case, and it may in many cases be effected to a great extent by a certain disposition of the sewerage works, but it will probably never become practicable to lay two house drains, one solely for sewage and the other for rain-water. The house-drain must carry not only the sewage, but as much of the rain-water falling upon the back premises of houses as cannot well be turned into another channel. The paved area from which rain-water flows into house-drains is extremely variable in extent. It may average 70 or 80 square yards, but is less in many, and much more in some cases. If 400 square yards be taken as an example of a large area, it may be sufficient for the purpose of seeing whether an inclination of 1 in 60 is sufficient for a house drain 6 in. in diameter. An extreme depth of rain may be taken at four hundredths of an inch per minute, continuing for half-an-hour, producing in that time 1.20 in. in depth. Some small part of this may, by evaporation, not reach the drain, but on a paved area this small portion may be neglected. This quantity, then, running off this area would be 12 cubic feet per minute. Taking the case in its most extreme form, and supposing the discharge of sewage to be occupying at the same time a depth of 1½ in. in the bottom of the pipe, the quantity of sewage would be, say, 8 cubic feet per minute. Adding to this 12 cubic feet of rain-water, the combined quantity would be 20 cubic feet per minute, and would, by the table, be carried off by the drain when running not more than half full.

If the drain with this rate of inclination run two-thirds full, the sectional area of the body of water would be .139 square foot. The hydraulic mean depth would be .1455 ft. Combining the inclination with this depth, it is found that there would be a velocity of 4.60 ft. per second and a discharge at the rate of 38 cubic feet per minute. Deducting as before the 8 cubic feet of sewage, there would be room for 30 cubic feet of rain-water per minute. Dividing this by four hundredths of an inch, the area from which 30 cubic feet per minute would proceed is found to be 1,000 square yards. So that it may be said a 6-in. pipe laid with water-tight joints at a regular inclination of 1 in 60 is sufficient for the requirements of the house sewage, and also for the greatest quantity of rain-water which can come into it.

It is only for the main portion of the drain that these results will hold good,—for a length, say, of 60 ft.,—and not for short branches. The most common diameter of pipe for the main portion of the drain is 6 in., but there are some reasons for preferring a diameter of 4 in. The objection to 4-in. pipes is that they look too small; a 6-in. pipe seems to be more important and better worth laying well. A 4-in. pipe of insignificant appearance, and, perhaps, is too often looked upon as not worth so much attention and care in making the joints water-tight, and laying the pipes in a perfectly straight line between the several points determined up beforehand as those at which changes of direction are to be made. Yet if the same care be taken in these respects with 4-in. pipes as with 6-in., they will often make the better drain because the numerous discharges of waste-water into the drain, many of which are but small in quantity, will often produce the desired depth, and solid sewage will remain unflushed away for shorter periods of time. Say a drain, although better for the house sewage than a larger one, may, of course, be too small to carry off the rain-water from the paved area.



and roofs of the back premises of houses in many cases. Without attempting to lay down any strict rule, one may see from the following small table how far, approximately, a 4-in. pipe may be used for this purpose. For the purpose

| 4-in. Pipe.  |                      |                                 |  |
|--------------|----------------------|---------------------------------|--|
| Inclination. | Velocity per second. | Quantity discharged per minute. |  |
|              | Ft.                  | Cubic feet.                     |  |
| 1 in 60      | 2.66                 | 2.71                            |  |
| 1 in 30      | 3.77                 | 3.86                            |  |
| 1 in 60      | 3.11                 | 5.60                            |  |
| 1 in 30      | 4.41                 | 7.94                            |  |
| 1 in 60      | 3.45                 | 9.00                            |  |
| 1 in 30      | 4.87                 | 12.74                           |  |
| 1 in 60      | 3.66                 | 12.62                           |  |
| 1 in 30      | 5.19                 | 17.87                           |  |
| 1 in 60      | 3.77                 | 15.83                           |  |
| 1 in 30      | 5.34                 | 22.43                           |  |

exhibiting the capacity of a 6-in. pipe to carry off rain-water and sewage at a rate of inclination of 1 in 60, and 1 in 30, we assumed 10 square yards to be a large area—it is much greater than the average—from which a great rainfall must be carried off by the drain. Making the same intensity of rainfall, viz., 1 in. in depth per minute, continuing for half-hour, and producing in that time a depth of 20 in., and taking also the same area, 400 square yards, it may be seen that a 4-in. pipe would barely be sufficient, the inclination being 1 in 60, but that, running full, it would be sufficient at that rate of inclination to carry off the rain-water from that area if the quantity of sewage being discharged at the same time were cubic feet per minute instead of eight, as we assumed it to be in the case of the 6-in. pipe; but, although we cannot expect the size of pipe to be at any time regarded in relation to the discharge of waste-water from time to time, and, therefore, must provide one sufficient for all circumstances, yet, if 6 cubic feet of sewage per minute be allowed to be as much as will be discharged at the same time as the rain-water is being carried off by the house drain, a 4-in. pipe, running full, will be sufficient for the area of 400 square yards; or, if the 8 cubic feet of sewage per minute be provided for, then it could be sufficient for an area of 333 square yards. If the 4-in. pipe, running only three-fourths full, it will carry off, beside the sewage, the rain-water from an area of 260 square yards, and so on; and it does not appear, therefore, that it is too small for most situations. It may make a matter of opinion whether, from a mechanical point of view, a 4-in. pipe is sufficient. Experience varies on this point; but, perhaps, opinions founded on insufficient experience vary more often.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

1,413, Marbled Cast-iron. B. B. Lee and S. Neale. According to this invention, two or more colours or shades are produced in a marbled or grained appearance upon cast-iron. A second coat or glaze is given to the "blount," or first coating, the different tints being put on by means of a brush in lines or streaks, or dashed, dropped, sprinkled, or sprayed thereon, and the article to which the pour is applied is then rapped with a mallet or hammer to cause the partial running of the wet glaze and bring them to a level. The glaze is dried by burning or drying in the ordinary way.

1,660, Air-warming Arrangements for Fireplaces and Stoves. E. H. Shorland. The object of this invention is the better arrangement of warming-gills and chambers for heated air supplied as described in a previous specification (No. 3,999, 74). The gills were generally arranged partly vertical and partly horizontal, but this patent they are arranged so that they lie flat from any imaginary point above the upper part of the gills, or so that the space between two of the gills is wider at the bottom or inlet than at the top. The effect of this is that the air is caused to travel more rapidly as it ascends, as it becomes warmer so there is a larger flow of air through the warming chambers.

1,908, Flushing Cisterns. W. & W. H. Cowan. In this modification of a previous patent the ball-valve is enclosed within and under the roof of the cistern, and the ball-valve is enclosed entirely in the tank, and is thus protected from injury external interference. Another modification is that the ball rises under a cupola or dome in the top of the cistern. A very small hole governs the rise of the ball, the air being slowly expelled through this orifice as the ball rises. Some other alterations are also described. These are all with a view of obviating the defects in existing apparatus.

18,896, Roofing-tiles. F. Hunsinger. The object of this invention is to provide tiles which shall effectually resist the ingress of the wind, and be at the same time cheaper to manufacture and to fix, and safer against slipping off or being blown off. The tiles are hexagon-shaped, and a ledge is made at an angle on the tile. On the under side, directly under and covered by the angle-point of the ledge, a hole or impression is made by which the tile may be hung on nails.

1,515, Machines for Making Bricks and Tiles. C. A. Eissner. The improvements which are the subject of this invention consist (1) in the manner of, and direct means for, actuating the cutters, and (2) in the mechanism or gear by which the movement of the material sets the actuating mechanism in motion, so that the cutting of the material is rendered dependent on the feed movement. The improvements are intended for that class of brick and tile machines in which the clay or material is cut into predetermined lengths.

3,560, Handles for Doors. J. Kaye. The object of this invention is to more effectually secure the bush in the handle in such a way that will admit of easy and secure adjustment on the spindles, and also form the bearing part. The specification describes at length the mechanical means by which this is accomplished.

5,205, Match-boarding, &c. C. L. Smiles and W. J. Davidson. The side edges of the boards are, according to this invention, formed with a wedge-like shape in cross-section, and a shoulder or recess, and the joint may be covered with a small strip to hide it if desired.

NEW APPLICATIONS FOR PATENTS.

Feb. 11.—2,365, J. Kerr, Stencil-holder for Painters and Decorators.—2,374, W. Leggott, Securing Casement-windows.—2,379, H. Potter and E. Assmann, Clay-cutting Machines.—2,383, R. Fox, Chimney-pots.—2,401, J. Wilkes, Press for Bricks, Tiles.—2,403, J. Hughes, Fireproof Material for Decorative Building Purposes.—2,408, H. Lake, Ornamenting Walls, &c.

Feb. 12.—2,426, H. Le Mesurier, Safety Stapling and Automatically Releasing Emergency Bolts or Door-locks, &c.—2,468, J. Evans, Fasteners for Window-sashes, Sliding-doors, &c.—2,469, L. Schlenker, Marble Mastic.—2,477, R. Knight, Heating and Ventilating Houses.

Feb. 13.—2,520, W. Davidson, Apparatus for making Eaves, Gutter-hooks, and Roof-ridge Straps.—2,526, J. Taylor, Tie-bricks for Cavity Walls.—2,530, O. Hickton, Automatic Cupboard-door Fastener.—2,539, De Pennefather, Ventilating.—2,546, E. Lisle, Chimney Cows.—2,556, T. Wernick, Wood Pavement.—2,578, W. Punched, Apparatus for Depositing Concrete, &c.

Feb. 14.—2,602, A. and J. Gilbert, Chimney-pots.—2,632, J. Sugden, Artificial Building Materials. Feb. 15.—2,688, W. Defries and V. Feeny, Hinges, 2,692, W. Poole and A. McDonald, Testing the Joints, &c., of Drain-pipes.—2,702, E. De Meier and E. Greenwood, Paper Stucco.

Feb. 16.—2,741, G. Newman, Door-springs and Cheeks.—2,780 and 2,781, A. Ponton and others, Artificial Stone.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,435, W. Hartley and others, Portable Stack-pipe.—18,269, J. and B. Lisle, Draught and Weather Excluder for Doors and Windows.—18,388, S. Wright and R. Bate, Flushing Cisterns for Water-closets, &c.—106, E. Hutchins, Chimney-tops, &c.—412, U. Smith, System of Sewerage.—413, U. Smith, System of Sewerage.—515, A. Day and F. Green, Window-sash fastener.—517, S. Hazeland, Wood-planing Machines.—639, G. Jennings, Water-waste preventers for the Supply of Water to Closets, &c.—657, F. Baker, Fastenings for Cupboard-doors, &c.—777, G. Goodwin and W. How, Tip-up Closet-pans, &c.—883, A. Hamilton, Door-handles.—908, J. Woodard, Sash-fastener.—908, J. Woodard, Ventilating Rooms.—974, J. Gilmore and W. Clark, Locks and Fastenings.—977, J. Harper, Portable Scaffold.—993, R. Newell, Ventilator or Chimney-top.—1,014, W. Hindle, Water-closets.—1,158, W. Woodward and J. Walton, Fastenings for Doors and Gates.—1,232, H. Blackwood, Artificial Stone.—1,312, J. Barron, Chimney-tops.—1,353, J. Clayton and C. Tindall, Water-closets.—1,435, A. Fowler, Privies and Water-closets.—1,539, J. Ingleson, Window-sashes and Sash-frames.—1,642, W. Crichton, Raising, Lowering, and Locking Window-frames.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,634, W. Fraser, Noiseless Closing of Doors.—5,521, W. Seward, Valves for Baths and Lavatories.—5,728, O. Elphick, Water-waste Preventers.—10,515, J. Auth, Window-glass Setting.—18,042, A. Harris and H. Locock, Spring Catches for Doors.

**Ancient Sculpture in Bronze.**—Want of space this week compels us to hold over the reports of Mr. A. S. Murray's second and third lectures at the Royal Academy on this subject until next week. We reported and illustrated his first lecture last week (see p. 145, ante).

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

FEB. 18.

By G. A. WILKINSON.  
Forest-hill, Cannock-road—The freehold residence, "Highlands"—2500  
The freehold residence, "Hill View"—520  
Pockham—1, Moncrieff-street, 71 years, ground-rent £4. 10s. .... 445

By R. H. EVANS.

Islington—67, Copenhagen-street, 32 years, ground-rent £6. 6s. .... 325  
94, Gifford-street, 78 years, ground-rent £2. .... 305  
60, Binglefield-street, 80 years, ground-rent £3. .... 670

FEB. 19.

By P. D. TUCKER.  
Islington—7 and 9, Halliford-street, 53 years, ground-rent 3s. .... 1,300  
By H. BUTLER, SOY, & VINT.  
Tottenham Court-road—8, Little Goodge-street, freehold ..... 785  
By GEO. GOSWORTHY, SOY, & CO.  
Notting-hill—117 and 119, Clarendon-road, 48 years, ground-rent £16 ..... 650  
Battersea—78, Meyrick-road, 57 years, ground-rent £4. 5s. .... 175  
80, 82, and 84, Meyrick-road, 57 years, ground-rent £12. 15s. .... 535

FEB. 21.

By DYER, SOY, & HILTON.  
Lewisham—6, Limes-grove, 21 years, ground-rent £1 ..... 180

By R. J. COLLIER.

Maylebone—32, Upper Baker-street, 13 years, ground-rent £7. 7s. .... 600  
19, Upper Montague-street, 18 years, ground-rent £16. 10s. .... 560  
20 and 21, Upper Montague-street, 18 years, ground-rent £22. 10s. .... 1,170  
9 and 12, Dorset-square, 20 years, ground-rent £38. 1s. .... 2,630  
14 to 17, Dorset-square, 20 years, ground-rent £136. 10s. .... 6,340  
18 and 20, Dorset-square, 20 years, ground-rent £43 ..... 2,660  
24, Dorset-square, 20 years, ground-rent £31. 10s. .... 1,290  
25, Dorset-square, 20 years, ground-rent £31. 10s. .... 1,180  
St. John's Wood—30, Clifton-hill, 43 years, no ground-rent ..... 900  
76, Hamilton-terrace, 47 years, ground-rent £13 ..... 1,480  
61 and 62, Hamilton-terrace, 34 years, ground-rent £4 ..... 1,530

By NEWSON & HARDING.

Canonbury—park North—No. 18, term 46 years, ground-rent £5. 8s. .... 500  
King's Cross—No. 269, freehold ..... 708  
Barnsbury—18 and 19, Victoria-street, freehold ..... 685  
Islington—41, Gifford-street, 56 years, ground-rent £6 ..... 270  
18 and 22, Havell-street, 68 years, ground-rent £12 ..... 745  
31 and 32, Charles-street, 61 years, ground-rent £16 ..... 360  
3, Upper Southampton-street, 37 years, ground-rent £5 ..... 370  
Gray's Inn-road—33, Gough-street, 23 years, ground-rent £8. 10s. .... 190  
Euston-road—95, Drummond-street, 31 years, ground-rent £8 ..... 305  
Kensington—5 and 6, Warwick-road, 33 years, ground-rent £10 ..... 620  
South Hackney—83 and 79, Harrogate-street, 55 years, ground-rent £12 ..... 480  
Stoke Newington—21 and 22A, Clonbrook-road, 79 years, ground-rent £13 ..... 265  
25, Clonbrook-road, 79 years, ground-rent £13 ..... 315  
Finbury Park—77, 79, and 81, Alsen-road, 73 years, ground-rent £13. 10s. .... 340  
Holloway—64, Cromwell-road, 90 years, ground-rent £5. 10s. .... 155  
61, Hampton-road, 90 years, ground-rent £10 ..... 95  
44, Hampton-road, 74 years, ground-rent £8 ..... 160  
Easton-road—7 and 11, North Crescent-mews, 15 years, ground-rent £4. 4s. .... 85  
King's-cross—1 and 2, Field-street, 2 years, ground-rent £5 ..... 20  
East Finchley—4, Tarring-terrace, 65 years, ground-rent £2. 15s. .... 310

FEB. 22.

By E. MILLARD.  
City of London—18, 19, and 20, Noble-street, and 14 and 15, Silver-street, freehold, area 7,460 ft. 27,000  
By BAKER & SONS.  
City, Fenchurch-street—Ground-rent of £360, reversion in 28 years ..... 14,600  
Dorset-square—60, Balcombe-street, 38 years, ground-rent £4. 4s. .... 720  
22 and 23, Upper Park-place, 32 years, ground-rent £4. 4s. .... 655  
By R. REID.  
Pimlico—4, Palace-street, 22 years, ground-rent £30 ..... 360  
Soho—25, Serwick-street, 99 years, ground-rent £100 ..... 145

**Population and Open Spaces.**—Dr. R. L. Gould, of the Government Harbour Department, U.S.A., has made an examination of the position of some of the largest cities in the United States as compared with the principal cities of Europe. He produces conclusive evidence that the movement of the rural population towards urban centres, which is one of the most marked features of the old world, is equally pronounced in the United States, and enters, at some length, upon a discussion of the value of open spaces to the health of a community. Dr. Gould has prepared tables in which he summarises the results of his inquiries. From these it appears that Edinburgh has the largest amount of open space in proportion to the number of its inhabitants, having an acre of space to every 246 inhabitants. Prague comes next with an acre to every 247 persons. London has an acre to every 694.



## MEETINGS.

SATURDAY, MARCH 2.

*Association of Public Sanitary Inspectors.*—Sixth Annual Dinner, First Avenue Hotel, Holborn, 6 p.m.  
*Royal Institution.*—The Rt. Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." II. 8 p.m.  
*South Kensington Museum.* Mr. J. Starkie Gardner on "Iron and Artistic Ironwork." I. 3 p.m.

MONDAY, MARCH 4.

*Royal Academy (Lectures in Sculpture).*—Professor J. H. Middleton on "The Development of Medieval Sculpture in Tuscany as compared with that in other parts of Italy." I. 8 p.m.  
*Society of Arts (Lectures).*—Mr. Walter Crane on "The Decoration and Illustration of Books." I. 8 p.m.  
*Surveyors' Institution.*—8 p.m.  
*Society of Engineers.*—Mr. G. R. Strachan on "The Construction and Repair of Boats." 7.30 p.m.  
*Clerks of Works' Association (Carpenters' Hall).*—8 p.m.  
*Leeds and Yorkshire Architectural Society.*—Mr. W. Scott Morton on "Colour in Architecture and Interior Decorations." 7.30 p.m.

TUESDAY, MARCH 5.

*Institute of Builders.*—Mr. J. Randall on "The Inclusion of Provisional Amounts in Contracts." 8 p.m.  
*Institution of Civil Engineers.*—Mr. Gilbert Kapp on "Alternate Current Machinery." 8 p.m.  
*Sanitary Institute (Lectures for Sanitary Inspectors).*—Mr. B. W. Richardson, F.R.S., on "General History, Principles, and Methods of Hygiene." 8 p.m.  
*Birmingham Architectural Association.*—Mr. T. Blashill on "Vienna."  
*Manchester Architectural Association.*—Mr. L. Booth, on "Commission." 7.30 p.m.  
*Glasgow Architectural Association.*—Annual Business Meeting.

WEDNESDAY, MARCH 6.

*Carpenters' Hall (London Wall).*—Mr. Banister Fletcher on "Art and Design in Woodwork, &c." 8 p.m.  
*Civil and Mechanical Engineers' Society.*—Mr. E. A. Brayley Hodgkins on "Liquid Fuel." 7 p.m.  
*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting. 8.30 p.m.  
*British Archaeological Association.*—Mr. A. G. Langdon on "The Ornamentation of the Ancient Crosses of Cornwall." 8 p.m.  
*Society of Arts.*—Prof. Silvanus P. Thompson on "Arc Lamps and their Mechanism." 8 p.m.  
*Liverpool Engineering Society.*—(1) Mr. C. S. Pain, Assoc. Inst. C.E., will show a number of lantern slides of the Ynyw Waterworks. (2) Discussion will be raised upon the following subjects:—(a) "The Relative Advantages of Steel and Iron for Engine Shafts," by Mr. T. L. Miller, Assoc.-M. Inst. C.E. (b) "Is there any 'Fibre' or 'Grain' in Iron?" by Prof. H. S. Hele Shaw, M. Inst. C.E. (c) "The Cause of Increased Tensile when the Limit of Elasticity is exceeded in Ductile Materials," by Prof. H. S. Hele Shaw, M. Inst. C.E. 8 p.m.

THURSDAY, MARCH 7.

*Society of Antiquaries.*—Ballot for the Election of Fellows. 8.30 p.m.  
*Royal Archaeological Institute.*—Mr. W. H. St. John Hope, on "The Cornhill Priory, or House of White Friars at Hulse." 4 p.m.  
*Edinburgh Architectural Association.*—Mr. J. Clark on "Ornament." 8 p.m.

FRIDAY, MARCH 8.

*Royal Academy (Lectures in Sculpture).*—Professor J. H. Middleton on "The Development of Medieval Sculpture in Tuscany, as compared with that in other parts of Italy." II. 8 p.m.  
*Royal Institution.*—Professor Oliver Lodge, F.R.S., on "The Discharge of a Leyden Jar." 8 p.m.  
*Institution of Civil Engineers (Students' Meeting).*—Mr. C. F. Smith on "Mining in Spain, with special reference to the Lead Mines of Linares." 7.30 p.m.

SATURDAY, MARCH 9.

*South Kensington Museum.* Mr. J. Starkie Gardner on "Iron and Artistic Ironwork." II. 3 p.m.  
*Royal Institution.*—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." III. 3 p.m.

## Miscellaneous.

**The English Iron Trade.**—The English iron market still shows an unmistakable tendency towards an all-round rise. Pig-iron has been in an especially buoyant condition this week, the North of England order trade and the Glasgow warrant market taking the lead. The quotation of No. 3 Cleveland pig has been put up 1s. since our last report, and the movement is still upwards. At Glasgow, in an active market, prices have been advancing from 42s 7d. cash up to 43s. and higher, while Scotch makers have followed with quite phenomenal rises, ranging from 6d. to 2s. a ton. From Lancashire, advances from 6d. to 1s. a ton are reported, while Staffordshire makers fully maintain their rates. Although only a moderate trade is doing in Bessemer iron in the north-west, owing to the fact that makers are closely filled up with orders, quotations have been advanced 9d. per ton. As business in manufactured iron is fairly brisk, it is expected that prices will shortly be raised, the increased cost of pig-iron and coke also necessitating such a step. Tin-plates are dull, but unchanged in price. The steel trade is very active in rails, plates, and angles, and prices are well held up; but blooms and slabs, which are only in moderate request, have gone back to the former quotation of £3.17s. 6d. There is a lull in the shipbuilding trade, no fresh orders being reported this week. Engineers, like shipbuilders, continue active.—*Iron.*

## British Archaeological Association.

At the meeting of this Association, on the 20th ult., Mr. C. H. Compton in the chair, the progress of the arrangements for holding this year's congress at Lincoln was detailed. Mr. Earle Way exhibited some articles of pottery, of Roman date, found at Kent-street, Southwark. Mr. Winstone reported the discovery of a large series of articles of pottery in making excavations recently on the premises of Messrs. Harrison, St. Martin's-lane. Several specimens were exhibited, the articles being mostly of delft-ware, dating from the time of Queen Elizabeth. A discussion ensued as to whether some of the articles produced were not of English manufacture. Mr. Prigg described some of his recent discoveries at Elveden, near Thetford. Excavations on the site of an ancient burial-place revealed three large urns of brown-ware, which had been deposited with their necks downwards, and covered over by a circular *stiltula*, some of the metal mountings of which remained. The urns have the appearance of having been intended for burial purposes, but, although burnt bones were met with outside the circle of the *stiltula*, none were found with them. Mr. Prigg referred to the local controversy that has arisen relative to the age of the deposit, it being contended that, because some ornamentation of Celtic style occurs on the mountings, that the date must be pre-Roman. The meeting was unanimous, however, that the urns, two of which were exhibited, were of undoubted Roman date. A large hand-bell found at Mildenhall, of early Christian form, was also exhibited by Mr. Prigg. A paper was then read by Mr. E. P. Loftus Brock, F.S.A., on "The Ancient Churches of Cheshire." The dedications were passed in review, and it was shown that, in a county where many traces of the ancient Welsh saints might have been expected, they hardly occur at all. There are, however, many dedications to early Saxon saints, and few or none to those of Danish origin, although the Danes settled largely in the district. The architectural peculiarities, particularly the existence of many timber-built churches, were dwelt upon at length.

**Moving a House in Coblenz.**—The *Deutsche Bauvereine Blatt* gives the following account of the recent moving of a house in Coblenz. The house was situated close by the Löhrr-chaussee, and had to be removed sufficiently away to make room for a new Custom-house. To this end it would have to be moved 5 to 7 metres aside, and 15 to 20 metres further back. Previous to moving, the building was cleared, doors and windows removed, as well as the gable over the entrance. This having been done, and the foundations laid bare, huge rollers were inserted between the latter and the house itself, the bed on which the building was moved being made of heavy balks of timber. By the aid of powerful windlasses and pulleys on both sides, the house was raised on to the bed, when the whole was moved slowly by another set of winches. The number of rollers employed was only five, one being alternately shifted to the front. The new foundations for the building being already prepared, the task of placing it upon them was comparatively easy. So quietly was the moving effected that a number of pigeons kept in the loft did not appear the least flustered by the proceedings, flying out and in as usual.

**Testing for Dampness.**—Gelatine, according to the *Wiener Bauindustrie-Zeitung*, is a capital means for ascertaining whether a wall is thoroughly dry or not. The sheet gelatine of commerce is the best for the purpose. The thinnest pieces are selected; they are soaked in water for about a quarter of an hour, until they are quite soft, spread out flat on a greased sheet of glass, and stretched with the fingers until any folds and creases that may exist are smoothed out, and the whole is made as thin and uniform as possible. The sheets are then thoroughly dried in the air, rough or uneven edges are trimmed off, and the whole cut into strips about 4 in. long and 2 in. wide, for use in testing. If kept flat in a dry place, these gelatine strips are very sensitive to moisture. If a wall is suspected of being damp, without showing it outwardly, a slip of gelatine is moved slowly over it near its surface, but without touching it. If any damp spots exist, they are immediately indicated by the curling of the gelatine as it passes near them.

**St. Michael's, Coventry.**—Mr. G. Woodcock, who recently gave 10,000l. to the restoration of this church, has now offered to give further help.

## Liverpool Engineering Society.

The ninth ordinary meeting of the present session of this Society was held at the Royal Institution, Colquhoun-street, on February 20, Mr. H. West, M. Inst. C.E., Vice-President, in the chair, when a paper was read by Mr. G. Farrer, Assoc. M. Inst. C.E., upon "The Construction of Small Harbours, and the Sifting they give rise to." The author commenced by stating that twenty years ago he was called upon to design a harbour upon the north-western coast of Cornwallshire for the use of a private company, with which he is now intimately connected, and as he considered this to be a typical case of the many points to be considered and the difficulty to be overcome in designing such a structure, he took it as his text for the present paper. He then described very fully the physical position and conditions of the site of the proposed harbour, illustrating by numerous charts and diagrams the nature of the prevailing local winds, tides, and currents. The second portion of his paper consisted of a full description of the nature of the proposed pier and breakwater, and of the many difficulties he had to contend with in the construction of them, one violent storm destroying in an hour what had taken months to build; the wind and sea raging so fiercely that stones weighing many tons were tossed about like so many blocks of wood. He then gave the actual cost of construction of the different portions of the work. The third portion of his paper described fully the effects of the constructions of the pier and the breakwater upon the shifting sands, mentioning and explaining the peculiar phenomenon of the offshore winds causing the sand to accumulate in the harbour, and the in-shore winds removing them. He concluded with observations and recommendations as to the construction of similar harbours, and of the steamers which are generally used for navigating such coasts. A long and interesting discussion followed upon the various points raised in the paper, and after the author had replied fully, a hearty vote of thanks was accorded him.

**Liability of Architects.**—We have been asked to give publicity to the following announcement:—"At a meeting of the Philadelphia Chapter of the American Institute of Architects, held on February 12, a committee was appointed to draw up a blank form of contract for use between the architect and the owner, no such thing being in general use in the United States. It is desired in this form to clearly define the responsibility of the architect, as well as his duties, as by recent judicial decision in New York, this responsibility seems to be without limit, the architect being held in heavy damages because a chimney flue was not so proportioned as to insure the most economical consumption of coal in a steam-heating apparatus. Any blank forms of similar contracts, or information relating to the subject, would be very gladly received by the secretary of the committee, Mr. Edward Hurst Brown, 1,305 Arch-street, Philadelphia, U.S.A."

**The Swedish Wood "Villa" Industry.**—The manufacture of wood "villas" for foreign countries, particularly the warmer ones, is extensively carried on in Sweden, the principal factory being the Ligna Company of Stockholm. The buildings are erected in Sweden, taken to pieces, and re-erected in their destination. An order from South America has just been received for twenty villas, whilst a large one is in course of erection in the Paris Exhibition grounds.

**Saturday Lectures on Science and Art.**—We are asked to mention that, by permission of the Lords of the Committee of Council on Education, the Saturday Lecture Society have arranged for a series of lectures in the lecture theatre of the South Kensington Museum on Saturdays. Two of this series will be delivered by Mr. J. Starkie Gardner on "Iron and Artistic Ironwork," on the 2nd and 9th of March at 3 p.m. Tickets can be obtained at the Museum entrances, price 1s. each lecture.

## PRICES CURRENT OF MATERIALS.

| TIMBER.           |                | £. | s. | d. | £. | s. | d. |
|-------------------|----------------|----|----|----|----|----|----|
| Teak, E.I.        | .....load      | 2  | 0  | 0  | 14 | 0  | 0  |
| Sequoia, U.S.     | .....foot cube | 0  | 2  | 0  | 0  | 0  | 0  |
| Ash, Canada       | .....load      | 3  | 10 | 0  | 5  | 0  | 0  |
| Birch             | .....          | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm               | .....          | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantisc, &c. | .....          | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak               | .....          | 2  | 10 | 0  | 4  | 0  | 0  |
| Canada            | .....          | 5  | 10 | 0  | 7  | 0  | 0  |
| Pine, Canada      | .....          | 3  | 0  | 0  | 4  | 0  | 0  |
| " " yellow        | .....          | 3  | 10 | 0  | 5  | 0  | 0  |
| Lath, Dantisc     | .....fathom    | 4  | 0  | 0  | 5  | 0  | 0  |
| St. Petersburg    | .....          | 5  | 0  | 0  | 10 | 0  | 0  |





**LONDON.**—For erecting All Saints' Church, West Dulwich. Mr. G. H. Fellowes Fryne, architect:—

|                |             |
|----------------|-------------|
| Kirk & Randall | £25,145 0 0 |
| Mark Martin    | 20,210 0 0  |
| Abley          | 20,112 0 0  |
| Ferry & Co.    | 20,068 0 0  |
| J. Martin      | 19,977 0 0  |
| Kynoch & Co.   | 19,595 0 0  |
| Dove Bros.     | 19,408 0 0  |
| Hall & Son     | 19,965 0 0  |
| Bowyer Bros.   | 18,930 0 0  |
| Goddard & Son  | 18,909 0 0  |
| Rowse          | 14,117 0 0  |

**LONDON.**—For alterations and repairs to "The Load of Hay," Præd-street, Paddington, W., for Mr. R. Baker, Messrs. Saville & Martin, architects, 88 and 87, Strand, W.C. Quantities supplied:—

|                |            |
|----------------|------------|
| Schluter       | £1,870 0 0 |
| Burdett & Sons | 1,735 0 0  |
| Ward & Lambie  | 1,487 0 0  |
| Walker         | 1,450 0 0  |
| Spencer & Co.  | 1,390 0 0  |
| Oldrey & Co.   | 1,368 0 0  |
| Gould & Brand  | 1,366 0 0  |
| Yardley & Sons | 1,169 0 0  |

**Peateer's Work.**

|             |          |
|-------------|----------|
| Watts & Co. | 127 17 0 |
| Heath       | 117 0 0  |
| Ruse        | 114 17 0 |
| Helling     | 112 0 0  |

**Gas-fitter's Work.**

|               |         |
|---------------|---------|
| Vaughan & Co. | 48 0 0  |
| Winn          | 43 6 0  |
| Pragnell      | 41 10 0 |

**LONDON.**—For alterations and additions to the Islington Dental Surgery, No. 69, Upper-street, Islington, N., for Mr. Chadwick Brown. Mr. G. H. Hipkirk, architect:—

|                         |          |
|-------------------------|----------|
| L. H. & R. Roberts      | £497 0 0 |
| C. B. Roberts           | 409 0 0  |
| A. & W. Garner, Peckham | 394 0 0  |

**LONDON.**—For desks and fittings for Capital and Counties Bank, Piccadilly Branch. Mr. W. Kinder, architect, 3, Old Broad-street, E.C.:—

|               |          |
|---------------|----------|
| Warland       | £294 0 0 |
| Drew & Cadman | 250 0 0  |
| Ratcliffe     | 242 9 0  |

**MELLIS (Norfolk).**—For the erection of new grist-mill, near the railway station. Mr. F. Whitmore, architect, Chelmsford:—

|                          |          |
|--------------------------|----------|
| W. H. Gibbs, Saxmundham  | £415 0 0 |
| Alfred Cox, Ipswich      | 400 0 0  |
| O. T. Gibbons, Ipswich   | 390 0 0  |
| Alf. Diss, West Bergholt | 350 0 0  |

**NOWTON (Suffolk).**—For the erection of new rectory-house at Nowton, near Bury St. Edmunds. Mr. F. Whitmore, architect, Chelmsford:—

|                                      |            |
|--------------------------------------|------------|
| H. G. Frost, Bury St. Edmunds        | £1,420 0 0 |
| J. Shillitoe & Son, Bury St. Edmunds | 1,400 0 0  |
| J. Robinson, Jun., Bury St. Edmunds  | 1,243 0 0  |
| G. R. Hawkins, Monks Elleigh         | 1,200 0 0  |
| A. Diss, West Bergholt               | 1,200 0 0  |
| F. Tooke, Bury St. Edmunds           | 1,120 0 0  |

**PINNER (Middlesex).**—For pulling down and re-building "The George," for Messrs. Salter & Co., of Rickmanworth. Mr. Charles F. Ayres, 53, High-street, Watford, architect:—

|                               |          |
|-------------------------------|----------|
| H. M. Dove                    | £995 0 0 |
| G. & J. Waterman              | 894 0 0  |
| T. Turner, Limited (accepted) | 846 0 0  |

[All of Watford.]

**WATFORD.**—For warehouse at Watford, for Messrs. R. White & Sons. Mr. C. W. Lovett, architect, 14, Cockspur-street, London, W.:—

|                          |            |
|--------------------------|------------|
| Judge & Eames (accepted) | £1,560 0 0 |
|--------------------------|------------|

**WEYBRIDGE.**—For erecting pair of houses for Mr. Geo. Kent. Mr. W. I. Chambers, architect, Woking:—

|                              |            |
|------------------------------|------------|
| W. & A. Brown, Outlands Park | £1,100 0 0 |
| W. B. Young, Weybridge       | 930 0 0    |
| F. Peters, Outlands Park     | 940 0 0    |
| Thos. King, Outlands Park    | 930 0 0    |
| Mathews & Mann, Weybridge    | 910 0 0    |

**WOODFORD.**—For building a villa residence at Woodford:—

|                             |          |
|-----------------------------|----------|
| A. Hood, Bethnal-green-road | £472 0 0 |
|-----------------------------|----------|

\* Accepted.

**Premises at Westow-hill, Upper Norwood.**—In the list of tenders for this work, published on p. 156 of our last number, read "J. & C. Bowyer," £294, instead of the other name appended to that tender.

#### TO CORRESPONDENTS.

W. W.—W. P. B.—"Box" (It is not our business to answer such questions.)—"Cambridge" (an name or address of correspondent enclosed).—C. H.—"Mining" (see below the notice, which has stood there for many years, that we cannot undertake to look up books for readers).—E. J. R. (undisable for insertion, amount not being stated).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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# The Builder.

VOL. LVI. No. 2405.

SATURDAY, MARCH 9, 1889.

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### More about the Monumental Chapel Scheme.



IN another column we print two letters from architects in reference to the proposed addition of a monumental chapel to Westminster Abbey, embodying very opposite views on the subject. The current number of the *Nineteenth Century* contains two short articles, one by Mr. William Morris, the other by Mr. Knowles, the editor of the magazine, which are, if that be possible, still more opposite to one another. All of these, however, may be taken as typical of the views of various cliques, each of which is desirous to have its say on a subject of such national interest as a proposal to add to or in any way touch Westminster Abbey; and, though many of the remarks that are being made are impracticable and one-sided in their nature, they are mostly of use as suggesting various views on the subject, or each of which something may be said.

Mr. William Morris writes in the capacity of Honorary Secretary of the Society for the Protection of Ancient Buildings. A scheme closely involving the welfare of Westminster Abbey and its precinct "must," he says, "be of extreme interest to the Society for the Protection of Ancient Buildings; and it is the duty of that Society to criticise it without fear or favour"; a duty which that Society, we need not doubt, thoroughly enjoys. It is to be feared, however, that the truly faithful among the "Anti-Scrapes" will not entirely approve of their Honorary Secretary's article, once he falls into the unwonted weakness of attacking and speaking disrespectfully of monuments which are, and have been for some time, in existence. Mr. Morris is eloquent in regard to the Abbey itself, no doubt; he flourishes with the usual fervour at adverb "surely," which is one of the literary ensigns of the writers of his clique; Such a building should surely be sacred to us; surely nothing should be touched in it, no work should be undertaken in it without the necessity being made clear by the gravest deliberation of the skillfullest and honestest person among us," &c. But when we come to monuments in the church, there is by no means the orthodox worship of the past to be recognised. Mr. Morris divides the monuments into two sections, those in which the original architecture of the building has been

considered, and those in which it has been ignored. The former, according to Mr. Morris's classification, are tolerably harmless, and there were official and other reasons to account for the burial in the church of those whom they commemorate. For the others no name is bad enough, and they seem as if placed for the express purpose of insulting the original architecture of the church as coarsely as possible, "but, of course, their producers never attained to such a pitch of intelligence as that." This is not too much to say of many of them; but then what becomes of the principles of the Society for the Protection of Ancient Buildings, according to which (as repeatedly put forth in their circulars) anything which is a relic of the taste and predilections of a past generation is *ipso facto* sacred? The Society would, no doubt, have prevented the erection of many of the eighteenth-century monuments if it had existed in that day; but, according to its own principles, as repeatedly set forth and illustrated in its annual reports, when the monuments had once been placed there, the Society should have been equally anxious to preserve them as illustrations of the temper and taste of the generation which erected them. As far as this goes, Mr. Morris is evidently recalcitrant; he is no sound member of the Guild which he represents; he has been betrayed into speaking scoffingly of monuments more than a century old, and we shall be much surprised if he is not called to account for this heresy at the next annual meeting of the Society. In his scoffs at the monuments themselves we should be in sympathy with him, however; but Mr. Morris sneers also in a very unnecessary manner at the feeling which gave rise to them:—

"They represent, not the natural, quiet course of sepulture in a famous church, a great centre of civil and ecclesiastical administration, but a new piece of conventional pedantry, the growth of the period between the Middle Ages and Modern times, much akin to the creation of academies for the living, which was a process of the same period; in short, they are a privileged class of memorials of the privileged dead. From the end of the seventeenth or beginning of the eighteenth century it has come to be a custom of our nation that anyone who could acquire a certain degree of respectable notoriety might put in a claim to burial and commemoration in Westminster Abbey as a final privilege, a last honour accorded by a grateful nation to his energy and self-assertion."

In regard to the interments of recent days, this cynical, ill-natured sneer seems to us in as

bad taste and as uncalled for as anything well could be. The first names that occur to us of those who have been buried in the Abbey of late years are Sterndale Bennett and Darwin, two as typical specimens of the modest, simple-minded unostentatious man of genius as could well be named. The remark might be applied to the eighteenth century interments with a certain amount of truth, perhaps, but it is untrue now; there is no competition to be buried in Westminster Abbey. It is an honour conferred by the nation on those who have deserved well of their country, and it may be doubted whether Mr. Morris, by no means himself one of the humblest or most reticent men of his generation, will find his own "self-assertion" rewarded in the same manner.

The argument, however, as continued by Mr. Morris, is that there should be no more monuments allowed in the Abbey; as there is no more room, why not give up the farce, "and put an end to the strange experiments in ugliness under which the Abbey has so long suffered?" We presume Mr. Gilbert's monument to Fawcett is one of these "experiments in ugliness," an opinion which would be hardly more unreasonable than the conclusion of the previous sentence, that "the busts produced by modern sculpture are not quite congruous with the architecture of people who knew how to carve." No, they are not, for they represent a greater knowledge of the figure and a greater power of modelling than any Mediæval sculptor possessed; the incongruity is only in that sense. Mr. Morris's cynicism, however, may be of use in suggesting one view of the question, viz., is a monumental chapel in connexion with the Abbey desired by the majority of people at all? Is it the same thing to any one as burial in the Abbey? The latter question Mr. Morris does not touch; but assuming, for the sake of argument, that people do wish to have room to continue this "curious habit" of memorials to "successful competitors," he objects to any building for this purpose having any connexion with the Abbey at all, of course on the ground that such a building cannot be connected with the Abbey except by means of some structural alteration in the ancient building, a proceeding which, we need not say, would be held in abhorrence by the Society which he represents. We do not share Mr. Morris's views in this respect, but we cannot help thinking that he is pretty near the truth when he says, after objecting (on the same grounds that Mr. Clarke does) to



placing the proposed chapel on the site of ancient remains of the Abbey buildings:—

"But the chapel thus placed on this objectionable site, Mr. Lefevre finds it necessary to make a passage from the Abbey-church into it, so as to claim for it the quite false position of its being a part of the Church. This said passage, of course, blocks up the side of the Chapter-house and its buttresses, and cuts off a huge cantile of Poet's Corner, and would be altogether an awkward and injurious addition to the Abbey."

So far as that sentence goes, we are quite with Mr. Morris; the proposed method of connecting the new building with the old would undoubtedly, as we have already said, be clumsy and unarchitectural, and would spoil the appearance of the Chapter-house; and it is equally true that a new building reached in such a manner from the Abbey would never be felt by any one to be a part of the Abbey; it is a mere make-believe to think so. If the new chapel cannot be made a more integral part of the Abbey than that, we are disposed to agree with Mr. Morris that it would be more sensible, if we keep up a system of public national funeral honours, to build a monumental hall quite independent of the Abbey, and standing for what it is,—a modern monumental hall, and not a pretence of being part of an ancient building.

Mr. Morris seems to assume that in that case there would still be some kind of suitability in placing the hall in the near neighbourhood of the Abbey, and suggests the Abingdon-street site; but in reality, if direct connexion with the Abbey is once given up, contiguity to it is no special object. The land to the south of the Houses of Parliament, which we have already suggested, is a much finer site, if the thing were to be done in a manner worthy of the nation. Mr. Morris has reason in his suggestion that the building should not in any way suggest a chapel, having in view the fact (which is undeniable) that some of the competitors may have held opinions, which may be shared by their surviving friends, at variance with the sentiment that attaches to a building having the resemblance of a church. Mr. Somers Clarke, on the other hand, very naively remarks that "being Englishmen, we do not want Campo Santos, Pantheons, and such outlandish things"; an outbreak of inherent John-Bullism which is touching, if illogical.

Mr. Somers Clarke's proposition for a building on the site proposed by Mr. Shaw Lefevre, but only covering the portion not occupied by any remains of Mediæval buildings, is reasonable and worth consideration from his point of view; and his suggestion that a building placed east and west is superior for effect of light to one running north and south, is not to be overlooked. But this scheme includes the idea of direct connexion with the Abbey, and it is very difficult to see how this is to be achieved with success from an architectural point of view. The method of having an aisle winding under a portion of the flying buttresses of the Chapter-house, which he seems to tacitly accept, is bad in two senses. For the object of connexion with the Abbey, of making the new chapel practically a part of the Abbey, it is not direct enough; the access would be an undignified and ineffective one, and the connexion with the Abbey, if that object is considered as of primary importance, is not close enough. No one could regard a chapel so approached as forming a part of the Abbey-church; it is an appendage reached by a kind of back passage,—and externally it is certain that such a method of communication must have a bad effect architecturally. The appearance of the Chapter-house would be spoiled by it. The only method of juncture which would produce a satisfactory external effect would be to make the Chapter-house the vestibule to the chapel, and place the latter east and west on the axis of the Chapter-house, and parallel with Henry the Seventh's Chapel. This might have a fine effect *externally*, especially if the new chapel were treated with a richness of detail corresponding with that of Henry the Seventh's Chapel; not, of course, in imita-

tion of it, but with the same degree of elaboration. This, however, could only be regarded as a possible solution as far as concerns exterior effect. It would be necessary to destroy the unity of design of the Chapter-house by breaking an arch through its eastern face, and to falsify the proper function and meaning of the Chapter-house itself; but we are unable to see any other way of connecting the new building satisfactorily with the old in an architectural sense, as far as external effect is concerned.

We now come to Mr. Knowles's short article, a great contrast, in its common-sense language and practical character, to the effusions of Mr. Morris. Mr. Knowles's idea is the same which we suggested a fortnight ago, and it is very well put and without a superfluous word. The two main arguments on which it is based we may give in Mr. Knowles's own words:—

"A substitute for Westminster Abbey might grow, in the course of another thousand years, but it could not be made, and until every existing opportunity has been exhausted would evoke no sympathy or enthusiasm."

Beyond the objection of the great expense (estimated at 140,000*l.*) of any new edifice, and the equally great objection that monuments in a new building, quite distinct from the Abbey, and devoid of any sort or kind of association with it, would have small interest or attraction for anybody, comes the capital objection that it is unnecessary; for the Abbey itself, in one of its most exquisite and most ancient portions, can still afford abundant space."

The suggestion is to place future statues, tablets, busts, or other monuments, in the cloisters, which, as Mr. Knowles says, form an integral portion of the original fabric, and are directly connected by two doors with the nave of the church. At first he would propose that the north and east aisles only, which are the most closely incorporated with the Abbey, might be filled; "but they would give sufficient space for a hundred years." The Chapter-house, which opens from the east walk of the cloisters, might also receive memorials, to the great addition of its architectural effect, and certainly not unsuitably in any other respect. Mr. Knowles adds another consideration: that the cloisters are now in such a state that some expenditure on them before long is necessary, if they are to be preserved from ruin.

"Finally, in the green-swarded square framed by the cloisters would be abundant space for all the actual interments of great men which might become necessary. There, in the very heart of London and of the Empire, they would lie under grass as green as in the quiet of a country churchyard, and surrounded on every side by the most majestic memories in the world."

All this may be the future of the cloisters, and for a sum which, if included in the Estimates for their preservation, would almost certainly be obtained at once from a unanimous House of Commons."

This is admirably put; and, moreover, we believe the conclusion expressed in the last sentence is well founded. There would be little doubt of the money required being voted.

There is one objection, which has been urged already: that the cloister walls are now occupied with a certain number of memorial tablets; and we think Mr. Knowles must plead guilty, with ourselves, to having rather overlooked the extent, to which this is the case. Most of these are comparatively small and placed high up, and they do not obtrude themselves much on the notice of the passer-by unless attention is specially directed to them; but nearly every bay is occupied with one, and to remove them would be a kind of impiety. But the obstacle is not so insuperable as may at first sight appear. There is a large amount of space below them and between them; and we have in recent days learned the lesson that monuments, to be beautiful and appropriate, need not be of large size and obtrusive character. In regard to the south walk of the cloister, Mr. Somers Clarke's objection holds good; it is a thoroughfare to various dwelling-houses

\* Mr. Somers Clarke, we observe, in his desire to find arguments against the scheme, and in favour of his own, asserts that the walls of the cloister are "encrusted with tablets"; a ridiculous exaggeration.

within the precinct. But the objection does not, to our mind, apply to the west wall, which is an access to the church; there is nothing out of keeping in placing monuments in such a situation.

We may conclude with a reference to one or two other points in connexion with the subject. The remark in Mr. Clarke's letter that "the Little Cloister, with its view of the Victoria Tower, would be entirely ruined" by Mr. Shaw Lefevre's large building risks close against the eastern side of it, is strictly true. As he says, the houses that were demolished by it would be hardly habitable with the wall of the great building rising above and stopping out all the light; and it be thought that the view of the Victoria Tower from this cloister is not a thing worth preserving, we should recommend those who think so to go and look at it again. It is one of the most remarkable architectural effects to be seen anywhere in London, and it would be a thousand pities to lose it.

Another consideration in regard to the building of a very large monumental chapel such as has been proposed, should not be overlooked. People would never be satisfied to see it stand long empty and unadorned; and an almost certain consequence would be that great men would be invented, as fast as possible, to fill the chapel with monuments. There would be a kind of rush to be buried there, and what ought to be a perfectly exceptional honour would become a cheap commonplace one. There is little doubt that the judicious caution which has been exercised generally of late years in regard to the honour of interment in the Abbey has been brought about partly by the fact that available space has become so small. It has been felt that where so few could now find place, those few must be those of whose worthiness for the honour there can be no question or difference of opinion. Had this been the same scarcity of space in the eighteenth century, many of the now obscure persons who are commemorated would never have found a resting-place in the Abbey, nor would even the more eminent have been permitted such large and cumbersome monuments. With the building of a monumental chapel larger than the present nave this wholesome material restriction would be removed, and there should have a string of big monuments on again. In the cloisters, the taste both of the artists who should design the memorials and of the friends who should influence the erection would be necessarily impelled in the direction of reticence and simplicity, of monuments remarkable for their artistic finish and expressiveness rather than for their size and pretension; and it may be safely said that there would be few indeed among the great spirits who might have claim to be commemorated in Westminster Abbey who would not prefer to think of a tablet with the walls of the cloister hallowed by historic memories, rather than of the most sumptuous tomb in a modern building having no link with the past and no association with the England of ancient times.

#### THE FORTH AND CLYDE SHIP CANAL SCHEME.

IN the *Builder* of September 6, 1888, the feasibility of a ship canal across Scotland at its narrowest neck was very fully discussed, and conclusions arrived at which at least were not inimical to a project of the kind. At that time and on to the close of the year the scheme engaged public attention in no inconsiderable measure; but nothing came of it, and ultimately the discursive attention of the country was carried off by some other passing attraction. Within the past few months there has been a revival of interest and speculation, this time displayed over a field which is distinctly wider, and with, of course, as part of the outcome, much inconsequent deliverance of the dilettante sort to which no attention need be paid.

The Forth and Clyde Isthmus may be



scribed in brief as a continued transverse depression, rather than anything of the nature of a ridge, a depression which, with a not very remote geological period, usually gave tidal passage to the waters of the sea. From the deepened Clyde to the open navigable waters of the Forth, the distance on the shortest section is about twenty-five miles, following, as it so happens, pretty closely the base line of the depression named. A century ago the shortest track across from deep water to deep water extended very nearly double that distance, viz., from off the mouth of the Leven, at Dumbarton Castle Rock, to low water mark on the Firth of Forth, at the mouth of Borrowstouness; but the Clyde has since been deepened up to Glasgow on a scale of a ship canal of the first class, while the sea outfall works of the modern port of Grangemouth, on the east, have been carried out on a scale hardly less promising. By the approximation of these two independent undertakings, the one on the west and the other on the east, the practical breadth of the isthmus has been reduced to twenty-five miles, starting from the Clyde on the western outskirts of Glasgow, and striking the partially indrawn Forth waters at Grangemouth. The position might be laid down in even more favourable terms. At Grangemouth, from the west, the river Carron carries the waters of the eastern estuary. The Carron is navigable for a few miles from its mouth, up as far as the well-known and almost ancient works of the Carron Company. This strip of inland navigation is short, certainly, extending to only two or three miles at the most, and its depth at present admits vessels of only a moderate draught; but, unquestionably, in any scheme cutting the isthmus it could be worked in very great advantage, simply by enlarging its dimensions to the extent required, so as to bring it about on a par with the western branch of the new work, consisting of the deepened channel of the Clyde. Considering, then, the comparative shortness of the track here excavated, thus reduced to little more than twenty miles; the very flat and low-lying character of the eastern flank of the isthmus, which for some distance inland beyond Carron Ironworks and past the parallel of Kirk is made up of an easily-worked sedimentary deposit, elevated but a few feet above low-water mark; and considering, no less, the moderate summit level of the central portion of the crossing valley, it would appear scarcely worth the while of engineering enterprise, or the enterprise of capital, to undertake the work unless to carry it through on the scale of a clean tidal cut like that of the Suez Canal, thereby dispensing all time with the burden, the risk, and the continual annoyance of a locked navigation on multiple levels. Engineering operations could be conducted under comparatively favourable conditions as to cost, having within hand several centres of plant and labour. The land, for the most part, is of great value, and, owing to the fact that a large tract of unproductive moorland borders the route to the north for a considerable distance, the intersections by railway and canal are singularly few in number. The existing Forth and Clyde Canal has been enlarged as far as capable of enlargement, so as to enable it to carry the heaviest tonnage. It may be; and so also, instead of being a narrow, might a very small ship be thickened and heightened, and even widened, to the measurements of a very large ship, but the result would be a very clumsy and unworkable one. To begin with, the old work put over a century ago is thirty-five miles long, or about 70 per cent. longer than necessary now, the navigable Clyde having been carried up to that extent in an earlier time. As a necessity of the manner in which the scheme was conceived and carried out, it gives its level no less than twenty times its course, which is accordingly impeded at that number of locks, not one of them of the slightest use for the purposes of a ship, as measured by modern ideas, the

dimensions being 74 ft. by 20 ft. only, or barely sufficient to give passage to a schooner of moderate size, while excluding altogether those of larger measurements. The highest of the twenty differing levels is 156 ft. above ordnance datum. This height is attained by mounting the rise of the land on either side by means of these locks or water-ladders, and, when attained, is kept unbroken for sixteen miles,—that is, about three-fourths of the distance to which an entirely new work would run if cut through on the present narrowest section of the neck. Over this central portion of sixteen miles the old work is often very wasteful in the engineering sense: unable, owing to its conditions, to take advantage of incidental depressions of the surface, which it either crosses, by huge and costly embanking, or avoids by following the run of the higher ground, at the expense of increased length. Probably no engineer, were he on the spot surveying the valley with a view to a ship canal of the first rank, would throw away a second consideration on the very unpromising possibilities of the old canal; but the latter look rather tempting on the map to the otherwise uninformed eye, and hence a good deal of the light-weighted speculation advanced on that basis. One or two critics have advocated carrying the canal by locks up the Vale of Leven, from Dumbarton, into Loch Lomond, and on to the Forth via the strath of the Endrick, thereby, as they astutely point out, saving ships a portion of the ascent of the Clyde,—which is about the same as if it had been proposed to make a canal from Tilbury round by Epping Forest into the Victoria Docks, in order to do away with the necessity of ships ascending the Thames.

Four years ago, when the project of cutting this isthmus for a ship canal on a large scale was last prominently on the tapis, a good many turned to the State as the only competent agency for carrying such an undertaking into execution; but it would appear that considerable advance has since been made in the popular mind as regards the financial bearing of the scheme. The formation of a ready passage for ironclads across Scotland at this important point would add enormously to the defensive forces of the nation, and there might be a manifold return speedily accruing to the investment; but, all the same, to wait for a Government strong enough and enterprising enough to embrace a scheme of the sort would simply be to wait indefinitely. It seems now to be dawning on the minds of capitalists that the scheme is sufficiently sound to stand on its own commercial merits, and it has even been hazarded that the bulk of the money necessary might be found in Glasgow, the place which would most largely benefit in a local sense. This largest of Scottish towns has grown phenomenally along with the gradual deepening of the Clyde, and it would certainly add very largely to the momentum of its growth to be put in direct touch with the waters of the German Ocean, even as it now is with the Atlantic. Its contribution to the canal traffic would, however, form only a part of the whole; on a reasonable tariff of tonnage dues a large through navigation would be induced, to which the whole of the eastern seaboard and several continental ports would contribute, in addition to the Irish, West of England, and American contingents. Very likely the present revival of interest is destined to exhaust itself without any step being taken, but, if so, it will in all probability awaken soon again, and with still more of purpose in it. The formation of a syndicate of promoters has been talked of, but it does not appear that, as yet, this has emerged from the stage of mere informal proposal.

**Royal Academy Lectures.**—Professor Aitchison's sixth Royal Academy Lecture (for which, owing to the space occupied by his long list of marbles, we have no room this week) will be published in the next number of the *Builder*, along with various diagrams of Roman construction, &c.

## NOTES.

THE dissatisfaction with which the trading community regard the new railway classifications and schedules was strongly illustrated by a meeting held on Monday at the Cannon-street Hotel, under the auspices of the Railway and Canal Traders' Association, which was presided over by Mr. J. W. Barclay, M.P. The meeting was a large and fully representative one, and all the speakers seemed to regard the companies' proposals as unreasonable, a series of resolutions being carried protesting against various objectionable provisions. Some speakers, indeed, emphatically denounced the classifications as useless, and urged that they should be objected to altogether, as being based upon wrong principles, or, as it was also put, lacking any intelligible principle whatever. A "scientific basis" has often been demanded, but would, perhaps, when obtained, prove delusive. It would certainly be a somewhat hazardous experiment to draw up classifications and schedules upon a new and untried basis, and it would appear to be more practical at the present juncture for each particular trade organisation to examine in detail the working of the proposals so far as their business or industry is affected, lodging protests against anything considered unfair or unreasonable. Larger organisations,—such as the Railway and Canal Traders' Association,—are apparently dealing with such "general" questions as are calculated to affect all industries alike. For instance, the neglect of the railway companies to comply with the Board of Trade requirements in regard to separate scales of charges for truck and train loads is being taken up; also the question of "small" It seemed to be the general feeling that the limit of weight for small consignments should be reduced rather than raised, a point which was also strongly dwelt upon at a meeting at Leicester last week. It then appeared that with the limit fixed at 560 lbs., nearly all the traffic sent out by some firms would be subject to the additional impost. The proportion of small consignments is probably very much larger now than it was when the companies were content with a 112 lbs limit, and the figure now proposed might very well be reduced at least one-half. The points alluded to are altogether independent of matters of detail (which are being dealt with by sub-committees of the Association), and as the dissatisfaction seems pretty general, the Board of Trade will probably be almost inundated with objections.

WE were glad to see, from a letter from the Marylebone Vestry Clerk in the daily papers, that a meeting was to be called on Thursday evening of this week (too late for us to give any account of it) to protest against the encroachment on Marylebone-road which has been sanctioned by the Metropolitan Board of Works, in the case of the intended new building for the Samaritan Hospital. This, of course, would be the thin end of the wedge, and the prelude to an advance of the frontage-line and removal of the open space along the whole road. It is important that this should be prevented. The wide margin along Marylebone-road, which is to some extent a kind of boulevard, and might be made more fully worthy of the name, is one of the favourable points in London street scenery, and ought to be preserved, unless very strong practical reasons can be shown to the contrary. We observe that the London County Council, at its meeting on Tuesday last, agreed to ask the Metropolitan Board not to come to a decision on the matter until the Council had been consulted about it; which is a step in the right direction.

THE following answer is among the records of Parliamentary proceedings of March 6th:—

"In answer to Mr. T. W. Russell, Mr. Plunket said:—I am informed that the North British Railway Company have acquired some ground in the neighbourhood of Falkirk, on which is situated a portion of the old Roman wall, and have run a



branch line through a part of the wall, at a spot, however, where the remains are not so well defined as they are more to the east. I am told that the railway company have at present no intention of interfering further with the wall, and they can if they like place it under the protection of the Ancient Monuments Act, but I have not any power to compel that to be done."

We fear there is not much probability that the railway company will take the trouble to put the remains under the protection of the Act if no one has power to compel them to do so. That is one of the misfortunes of writing "may" in the terms of an Act instead of "shall."

**THE Περικέα** (transactions) of the Athenian Archaeological Society for the year 1886 have just appeared, under the date 1888. The number is an unusually rich one, and contains material of such wide general interest that its seclusion in the modern Greek tongue is doubly to be regretted. The first plate is devoted to a detailed plan of the recent excavations at the precinct of the Temple of Jupiter Olympius at Athens. It supplements in many respects the plan given by Mr. Penrose in his last edition of the "Principles of Athenian Architecture." In the text that accompanies the plate the principal points of interest on which light has been cast by the excavations are noted: 1. The position and character of the propylon. 2. The tetragonal shape of the whole peribolos. 3. That the obscure semicircular building on the north side of the peribolos wall is of later date than the wall itself. 4. Some remains of drums of poros columns have been found outside the north wall of the peribolos, and from their character it seems likely they have belonged to the earlier building begun by Peisistratos.

**THE** same number contains also a ground-plan and restoration of the proscenium of the recently-excavated theatre at Oropos,—a theatre of which no mention is made in any ancient author, although Pausanias describes in detail the sanctuary of Amphiaraios, to which it belonged. Special points of interest about it are the inscribed cornice and the five seats of honour disposed at wide intervals, and also inscribed. Passing over some papers of much interest, the palm must undoubtedly be given to the account of the buildings in the Acropolis at Mycenæ by M. Tzountas, accompanied by elaborate plans and a coloured reproduction of the decorative paintings in the *istia*, from a drawing by Dr. Dörpfeld. The account claims the closest attention from all architects, topographers, and, we may add, Homeric students. The more ancient structures of pre-historic dates have been overlaid and much confused by the building of a large temple of Hellenic date, but below this M. Tzountas shows there is clear evidence of a large kingly palace, and that this was supplanted once and for all by smaller houses belonging to some conquering, but less wealthy, race. The megaron, prodromos, and aithousa of the early palace are clearly made out. The megaron itself was sculptured by four columns, of which the lower portions are sunk deep into the earth. They were manifestly of wood, and from some remains of metal flaking found near at hand it seems very possible they were coated with metal. In the centre, between the four columns, is the *istia* or *istia*, the circular hearth-place, of which the remarkable decorations have in part been preserved. The hearth is 3.40 m. in diameter, and is of curious though simple structure. It consists of a layer of clay laid on the floor of the megaron, and then plastered all over. This first layer is 0.15 m. thick. Above this have been successively laid on five thicknesses of plaster. That these were superimposed at different times is clear from the simple fact that some of them are adorned with patterns. Those reproduced in plate 5 are from the third layer, the best preserved, and they certainly deserve to be known. It is interesting to note that the Greek peasant nowadays makes his hearth, which he calls "*γυνία*," in

just the same simple fashion. This is only one of many instances in which modern traditional use throws light on primitive custom.

**WE** inserted a paragraph at the last moment last week, announcing the death, on Monday the 25th ult., at the early age of 36, of Mr. Charles Richard Pink, of Winchester, an architect in steady and increasing practice, and a good servant of the profession. Mr. Pink was the pupil in architecture of Mr. Thomas Henry Watson, remaining with him till he started in practice for himself. He passed the Preliminary Architectural Examination in 1872, and the Proficiency Examination in 1875. Always taking a keen interest in education for and in the profession, he has done good service as a member of the Special Education Committee of the R.I.B.A. In 1876 he became an Associate, and in 1886 F.R.I.B.A., and was a member of the Council in 1886. After the noteworthy excursion of the Architectural Association, under Mr. Edmund Sharpe's direction, to Charente in 1875, Mr. Sharpe (who died in 1877) wished that the members of the Association should try,—at any rate, for a year or two,—to conduct the annual excursion without his leadership. Accordingly, in 1878, an excursion was made to Winchester, and Mr. Pink's local knowledge, power of management, and pleasing character were so well appreciated that the excursions were, to a great extent, managed by him till 1885, when he conducted the Banbury excursion as President of the Association. Regrets that he should have joined the majority so early will be generally felt. The memory of his relish for good architecture and for other art of all dates, of his kindly spirit, his knowledge of heraldry, and his peculiarly pleasant humour, will linger long with those who made holiday with him. As an antiquary, Mr. Pink was a most conservative restorer; no stone or detail that could possibly relate to the history of the building was ever destroyed by his order, and the churches of Soberton, restored in 1880-2, and West Worldham, 1888, and the old Manor-house at Lottisham, Somerset, all bear witness of this loving care. In conjunction with Mr. James Fowler, of Louth, Mr. Pink was architect of All Saints Church and Vicarage, Denmead, in 1880. The Chilworth and West Baddeley Schools were built from his designs in 1875. The Catherine Wheel Temperance Hotel, Botley; Curridge Village Club; East Worldham farm-buildings; West Bradley Vicarage (Somerset); house and stabling at Winchester; house and stabling at Wyke; and The Brewery at Wickham, are his principal works. He was a rapid and effective sketcher, and had a sound knowledge of his profession, gathered from careful study of old work and extensive reading.

**ON** Saturday last, there took place, in the Cimetière du Nord at Paris, the funeral of the late M. Louis-Achille Lucas, Honorary Architect to the City of Paris, and Honorary Member of the Société Centrale des Architectes. M. Alfred Normand, Vice-President of the Société Centrale, attending in place of M. Garnier, who was unavoidably prevented, spoke of the works of the deceased architect, alluding especially to "Le grand groupe scolaire de la rue Tolbiac," and to the part which he had taken in the two editions of the "Manuel des Lois du Bâtiment," published under the auspices of the Société Centrale. M. Achille Lucas was the father of M. Chas. Lucas, Honorary and Corresponding Member of the Institute of British Architects, and well known to many members of the profession in London.

**WE** are glad to hear that the Duke of Westminster, who is one of the largest owners of important house property in London, has decided to allow none but certificated plumbers to be employed in future on new buildings on his estate. The following is a

copy of the letter addressed by the Duke to the Clerk of the Plumbers' Company:—

"The Duke of Westminster, feeling the [very] great importance, in a sanitary point of view, of good plumbers' work in houses, and appreciating the exertions of the Plumbers' Company in that direction, has decided that none but certificated plumbers are to be employed on new buildings on his estate. Every building contract on this estate provides as follows:—

"No plumber is to be employed upon the works unless he has the certificate of his efficiency from the Worshipful Company of Plumbers."

We hope other large house-owners in London will follow so excellent an example.

**THE** Exhibition of the "Society of Painter-Etchers," at the Rooms of the Water-colour Society, contain a great deal of fine and interesting work, including, however, some that can only by a stretch of language be called "etching." Mr. A. Haig seems to have nearly deserted pure etching for "aqua tint" effects: Mr. Finnie's landscapes (317, 329, 330) look more like photographs than etchings; Mr. Seymour Haden exhibits "The Breaking Up of the Agamemnon, Mezzotinted" (233), in which the strong dark etched lines on the shipping appear perfectly incongruous with the mezzotint treatment of sky and water; a mixture of two processes that have nothing in common. Mr. David Law's "Alnwick Castle" (12), a line etching in reality, might just as well be an engraving, all the characteristic effect of etching having been worked out of it. Some of the best of the pure etchings are to be found among the small plates hung mostly on the bottom line. Mr. R. Goff has some admirable little works of this class, notably, "Driving Piles, Venice Lagoon" (301). Among the architectural subjects of a larger scale perhaps the finest is Mr. C. C. Murray's "Lichfield" (294), a grand work of its kind. The President (Mr. Seymour Haden) exhibits a great number of etchings by means of equal merit, and the prices affixed to those which are for sale show an appreciation of their value in which the curious visitor will not always concur; especially comparing them with the prices of better works in the room. Among the things which the Society had better have rejected are the frames full of unintelligible scratches by Mr. Sicker, which are an impudent affectation that ought not to be tolerated. Nor is it intelligible why very small and not remarkable head by Mr. Menpes should be allowed a frame big enough for half-a-dozen drawings of that size. Among the etchings which struck us as a specially good we may mention Mr. Holloway's "Victory" (28), the old ship in Portsmouth Harbour; Mr. Percy Robertson's "Godalming" (44), a little pure line etching, beautifully drawn; Mr. Wilfrid Ball's "Venice" (52); Mr. Percy Robertson's "A Surre Bridge" (83); Mr. Haig's "Cologne" (92); Mr. Cameron's "Bowden" (105), a slightly sketched landscape scene; Mr. Haig's "Stockholm" (122), a wonderfully fine effect, but little of an etching; Mr. Slocumbe's "Amiens Cathedral" (278); Mr. T. C. Farrer's "The Day Requiem" (280), a very fine and solemn evening landscape, finished in every part, yet preserving breadth and unity of effect; Mr. Herbert Marshall's "Dordrecht Cathedral" (324), a dark, very powerful little work; Mr. Edgar Barclay's "Sowing the Hay" (326), Mr. W. Strang's "After Work" (334), a rustic idyll of great pathos of expression, and Mr. Robertson's "Leaving the Old Home" (342). In Mr. V. S. Hine's "Lincoln Cathedral" (111), a fine work in a pictorial sense, the western towers are shown much too thin in proportion to the centre one, an oversight which spoils the architectural effect and truth of the etching. Generally speaking, however, architecture is well treated by the Painter-Etchers.

**Bournemouth Surveyorship.**—We are informed that Mr. F. W. Lacey, Assoc.-M. Inst. C.E., Town Surveyor, Bournemouth, has been appointed Surveyor to the Bournemouth Commissioners,—almost unanimously,—out of 17 candidates.



## THE PRINCIPAL MARBLES USED BY THE ROMANS:

AN APPENDIX TO THE FIFTH ROYAL ACADEMY LECTURE.\*

*Being Corsi's list of Antique Marbles translated.*

ABSTRACTED AND ANNOTATED BY PROFESSOR AITCHISON, A.R.A.

## WHITE MARBLES.

| <i>Latin Names.</i>     | <i>Italian Names.</i>       | <i>Notes.</i>                                                                                                                       |
|-------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| armor Parium .....      | Greco Duro .....            | Parian from the Island of Paros. Pliny says it was called Lychnites. Used for the Mausoleum of Hadrian.                             |
| armor Porinum .....     | Grechetto Duro .....        | Found near Olympia in the Peloponnesus.                                                                                             |
| armor Pentelicum .....  | Greco Fino .....            | Pentelic marble from Mount Pentelicus, between Athens and Marathon. The outside linings of the Pantheon are said to be of Pentelic. |
| armor Hymettium .....   | Imezio or Cipolla .....     | Yellowish white, marked with bluish grey, giving it the appearance of ribbons.                                                      |
| armor Thasium .....     | Greco Livido or Tasio ..... | From the Island of Thasos. Used for covering the tomb of Caius Cestius.                                                             |
| armor Lesbium .....     | Greco Giallognolo .....     | Yellowish marble from the Island of Lesbos.                                                                                         |
| armor Tyrium .....      | Greco Turchiniccio .....    | Bluish. Steps of the Scala Santa are said to be of it.                                                                              |
| armor Lunense .....     | Marmo di Carrara .....      | Carrara is close by the ancient Luna, and not far from the Gulf of Spezia. Nearly all modern statues are made of it.                |
| armor Coraliticum ..... | Palombino .....             | Colour of a white dove, and much like ivory. Supposed to come from Phrygia.                                                         |

## COLOURED MARBLES.

|                       |                     |                                                                                                                                                                                                                                                                                   |
|-----------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| armor Numidicum ..... | Giallo Antico ..... | The quarries have been lately found in Tunisia. Pale yellow to tawny, and pink to red, extensively used. Some of the large internal columns of the Pantheon are of it, and those to the Arch of Titus. It has been used at the National Gallery and at the New Gallery in London. |
| armor Tænarium .....  | Rosso Antico .....  | From the quarries in the Promontory of Tænarum in Laconia, Peloponnesus (now called Cape Matapan). The quarries have been re-discovered, and Rosso Antico is now comparatively common.                                                                                            |
| armor Tænarium .....  | Nero Antico .....   | A uniformly coloured deep brick-red marble, sometimes inclining to deep purplish red, with nearly black streaks, and occasionally with white streaks or ribbons, and sometimes white, with red veins.                                                                             |
| armor Tænarium .....  | Nero Antico .....   | From the Promontory of Tænarum to the north of the quarries of Rosso Antico. A deep black marble, occasionally showing a white line like a hair, short, straight, and interrupted.                                                                                                |

## VEINED MARBLES.

|                                     |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| armor Jassense .....                | Porta Santa .....                                    | An island off Caria. (Mr. Brindley says from the Island of Chios, where he found quarries of it.) A purplish red and white in waves, sometimes called Claudian, on account of the fondness of the Emperor Claudius for it. Called Porta Santa, from the jambs of the door-case of the Porta Santa, at St. Peter's, Rome, being made of it.                                                                                                                                       |
| armor Carystium .....               | Cipollino .....                                      | From Carystus, in Eubœa. Mostly green or grey and white in waves, but sometimes red. Called Cipollino from the onion, because of its veins of mica, through which it can be divided. Columns of the Temple of Antoninus and Faustina at Rome, plinths of Pœcile, Hadrian's Villa.                                                                                                                                                                                                |
| armor Chium .....                   | Affricano .....                                      | From the Island of Chios. (Mr. Brindley says he found no quarries of Affricano there.) A magnificent marble, said to be a shell marble, but mostly known to us in its brecciated form. Dove-coloured, pale pink, or green, with masses of black and crimson. The skirting of the so-called libraries at Caracalla's baths are of this. Door-cases at Dorchester House.                                                                                                           |
| armor Molossium .....               | Fior di Persico .....                                | From Epirus, now Albania. White, with veins and clouds of purple and crimson. Mr. Brindley says he found a quarry in Elba.                                                                                                                                                                                                                                                                                                                                                       |
| armor Synnadicum .....              | Pavonazzetto, or Frigio, Docimino, or Migdonio ..... | From Phrygia, near the town of Synnada. White and sometimes yellow, like old ham fat, with purple veins. Much admired by Hadrian, who used it for his Mausoleum. About half of the large columns inside the Pantheon are of this marble. Horace calls it Phrygius lapis, and Juvenal Phrygia columna.                                                                                                                                                                            |
| armor Phengite .....                | Bianco e Giallo .....                                | From Cappadocia. White, with yellow veins. According to Corsi, very rare. Domitian had the portico of his palace in which he walked lined with this, that he might see people reflected in it before they were near enough to stab him; but it did not save the tyrant's life.                                                                                                                                                                                                   |
| armor Corinthium .....              | Giallo Tigrato .....                                 | From Corinth. The only specimen I ever saw in England is a vase of Mr. Holford's, at Dorchester House, said to be of this marble. This is a grey, veined with yellow, in only fine veinings; but this does not at all correspond with Corsi's description. He says it has a straw-coloured ground, and that the veins are always circular in form, inclosing a deeper yellow, resembling a panther's skin. I fancy there are statues of wild beasts in the Vatican made from it. |
| armor Batthium .....                | Bigio Antico .....                                   | Site of quarry unknown, but supposed to come from Cyrene, in North Africa. Grey, with spots, waves, and bands.                                                                                                                                                                                                                                                                                                                                                                   |
| armor Luculleum .....               | Bigio Morato .....                                   | From the Island of Melas in the Nile. First brought to Rome by L. Lucullus, the Great general, and called after him.                                                                                                                                                                                                                                                                                                                                                             |
|                                     | Ochio di Pernice .....                               | A bluish black that looks dusty. The only marble named by the ancients from the first user of it.                                                                                                                                                                                                                                                                                                                                                                                |
|                                     | Ochio di Pernice .....                               | Site of quarry unknown. Tawny, with violet spots, having some semblance to the eye of the partridge.                                                                                                                                                                                                                                                                                                                                                                             |
| armor Proconnesium or Cyzicum ..... | Bianco e Nero Antico .....                           | From the Island of Proconnesus, in the Propontis, or Sea of Marmora. I believe this to be angular masses of black in snow-white cement, commonly called Grand Antique. There is also a white marble.                                                                                                                                                                                                                                                                             |
| armor Celticum .....                | Bianco e Nero di Francia .....                       | France. Site of quarries unknown in Corsi's days. Black ground interspersed with reticulated veins and spots of milky white.                                                                                                                                                                                                                                                                                                                                                     |
|                                     | Bianco e Nero d'Egitto .....                         | Site of quarries unknown. Shell marble, the shells white. Called Egyptian, because Egyptian idols are found carved in it.                                                                                                                                                                                                                                                                                                                                                        |
|                                     | Bianco e Nero Tigrato .....                          | Site of quarries unknown. The white and black variegations are generally of equal volume.                                                                                                                                                                                                                                                                                                                                                                                        |
| armor Rhodium .....                 | Giallo e Nero .....                                  | The island of Rhodes. Black, with gold veins. Said by Mr. Brindley to be from Porto Venere, in the Gulf of Genoa.                                                                                                                                                                                                                                                                                                                                                                |
|                                     | Marmo di Cotanello .....                             | Quarries in the Sabine Country, north of Rome. Of several colours, but not vivid. Pale rose verging on deep peach blossom, with thick and short veins of white. Found at the Villa of Lucullus, near Terracina.                                                                                                                                                                                                                                                                  |

## SHELL MARBLES.

|                       |                                |                                                                                                                                                                                       |
|-----------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| armor Megarense ..... | Lumachella Bianca Antica ..... | Megaris, between the Corinthian and Saronic gulfs. A white shell marble used for columns and statues.                                                                                 |
| armor Schiston .....  | Broccatello Antico .....       | Tortosa, Catalonia, North of Spain. The well-known broccatello of golden yellow and pale purple, with occasional irregular white spots. A shell marble.                               |
|                       | Lumachella di Egitto .....     | Site of quarry unknown. White with bluish grey or black oyster-shells. Rare, the ground is sometimes of bright yellow or a coral red.                                                 |
|                       | Lumachella d'Astracane .....   | Site of quarry unknown, but this marble is said to come from Agra, in India. Usually a yellow or pale greenish yellow, marked with red. There are white and flesh-coloured varieties. |

\* Published in last week's *Builder*, p. 162, ante.

## SHELL MARBLES (continued).

Latin Names.

Italian Names.

Notes.

|                                |                                                                                                                                                |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Lumachella d' Astracane dorato | A yellow of golden colour, with shells; the rarest has a purple ground, with yellow shells.                                                    |
| Occhio di Pavone               | Site unknown. Red, purple, greyish white, and black ground; the shells cut through are white, and make the eyes; sometimes the shells are red. |
| Corno di Ammone                | Site unknown. Those marbles that contain ammonites in a perfect form.                                                                          |
| Lumachellone Antico            | Site unknown. Bluish grey; ground containing white ammonites.                                                                                  |
| Stellaria                      | White, bluish grey, and red ground, with shells of star form.                                                                                  |
| Lumachella Nera                | A mulberry-coloured black, with fragments of shells. Rare. There is also the rose coloured, the grey, the yellow, and the purple.              |
| Lumachella Rossa               | Site unknown. Deep red ground, with small white circles.                                                                                       |
| Lumachella Rosa                | Site unknown. Like the above, only pale pink ground.                                                                                           |
| Lumachella Bigia               | Site unknown. Grey ground.                                                                                                                     |
| Lumachella Gialla              | Site unknown. All straw colour. A mass of decomposed shells, sometimes with purple marks.                                                      |
| Lumachella Pavonazza           | Site unknown. White or red shells in a purple ground.                                                                                          |

## ALABASTERS.

|                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Marmor Alabastrum | Alabastro Antico | One quarry is said by Pliny to have been named from a town called Alabastron near Thebes, in Egypt (Lib. v., c. 11), on the Nile, but also came from Damascus, Carmania, Cappadocia, and India. He says, "That which is of a honey colour is most esteemed, covered with spots circling in whirls," which perfectly described the Oriental alabaster of the altar columns of St. Paul, outside the walls of Rome. It was confounded with onyx. The onyx mentioned in Genesis (cap. ii., v. 12) is said by Calmet to have been alabaster; but when the constituents were unknown, it was easy to mistake the two when similar in colour. Oriental alabaster is a hard carbonate of lime, while most of the European alabasters are sulphate of lime, and much softer, and every one differing in colour was called by a special name, as, for instance:— |
|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                     |                             |
|---------------------|-----------------------------|
| Alabastro Cotognino | Quince.                     |
| " Pomato            | Appled.                     |
| " a Giaccione       | Iced, or with lamps of ice. |
| " a Onice           | Onyx.                       |
| " a Nuvole          | Clouded.                    |
| " a Occhi           | Eyed.                       |
| " a Tartaruga       | Tortoiseshell.              |
| " Sardonico         | Sardonix.                   |
| " a Pecorella       | Sheep.                      |
| " Fiorito           | Flowered.                   |
| " Fortezino         | Fortressed.                 |
| " di Palombara      | Of Palombara.               |
| " a Rosa            | Rose.                       |
| " dorato            | Gilded.                     |
| " Erborizzato       | Herb.                       |

It is by no means certain that specimens of onyx, chalcedony, or jasper were not mistaken for it.

## BRECCIAS.

|               |                             |                                                                                                                                                                                                                                  |
|---------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Marmor Lydium | Rosso Brecciato             | Site unknown. Red ground with fragments of vivid white.                                                                                                                                                                          |
|               | Breccia di Aleppo           | Site unknown, though it is supposed to come from Aix, in France, or from Belgium. Gray, red, brown, and black fragments, in which yellow prevails.                                                                               |
|               | Breccia Dorata              | Site unknown. Yellow fragments in a purple ground.                                                                                                                                                                               |
|               | Breccia Corallina           | Site unknown. Small white fragments of coral in a paste of bright red.                                                                                                                                                           |
|               | Breccia Gialla e Nera       | Site unknown. Small black fragments in a yellow paste.                                                                                                                                                                           |
|               | Breccia Color di Rosa       | Site unknown. Flesh-coloured paste, with darker red fragments.                                                                                                                                                                   |
|               | Breccia Gialla Ombrata      | Site unknown. Orange paste, with fragments of still deeper colour, always triangular in form; but the colour of the fragments varies, and it is so called because the bands of yellow where they touch the fragments are darker. |
|               | Breccia della Villa Adriana | Site unknown. Ground brown, colour of roasted coffee; also yellow, red, green, blue, purple, and sometimes black and white.                                                                                                      |
|               | Breccia Traccagnina         | Site unknown. Of various coloured grounds, containing fragments of different colours. Called so from its supposed resemblance to the mask of a harlequin.                                                                        |
|               | Breccia Pavonazza           | Site unknown. Purple ground, with various coloured fragments.                                                                                                                                                                    |
|               | Breccia a Seme Santo        | Site unknown. So called from its resemblance to medicine given to children in various coloured sugar-plums.                                                                                                                      |
|               | Breccia de Sette Basi       | Site unknown. Called so from having been found at the Villa of Septimius Bassus on the Appian Way. Ground always purple, with oblong fragments of white, yellow, and red. The pattern larger than "Seme Santo."                  |
|               | Breccia Bianca e Nera       | Site unknown. Ground, dark mulberry, with pure white fragments, reticulated white veins.                                                                                                                                         |
|               | Breccia Rossa               | Site unknown. Clear red ground, inclining to purple, with elliptical fragments of pink, greenish grey, white, and yellow.                                                                                                        |
|               | Breccia Verde               | Site unknown. Ground colour of an olive-leaf, small triangular fragments of a darker green.                                                                                                                                      |
|               | Broccatellone               | Site unknown. Peach-blossom ground, with canary-coloured fragments.                                                                                                                                                              |

## OTHER MARBLES.

|                   |                      |                                                                                                           |
|-------------------|----------------------|-----------------------------------------------------------------------------------------------------------|
| Marmora Lunensia  | Bardigli             | From Carrara. Grey ground, with darker markings.                                                          |
| Marmora Pisana    | Marmi Argillosi      | From the neighbourhood of Pisa. Mostly bright green. The dendrites of this have trees on a yellow ground. |
| Marmora Ligustica | Serpentine e Graniti | Ligurian stones, from the principality of Genoa. The green of Polcevera, and a green and white granite.   |

## FALSE JASPER.

|                       |                           |                                                                                                       |
|-----------------------|---------------------------|-------------------------------------------------------------------------------------------------------|
| Marmora Tauromenitana | Diaspri Teneri di Sicilia | From Taormina, in Sicily. Called jaspers from their resemblance in colour and figure to real jaspers. |
|-----------------------|---------------------------|-------------------------------------------------------------------------------------------------------|

## SERPENTINES.

|                  |                         |                                                                                                                                                                                                                                                                                                                                               |
|------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lapis Ophites    | Verde Ranocchia         | Serpentine. Said to come from Egypt.                                                                                                                                                                                                                                                                                                          |
| Lapis Augusteus  | Verde Ranocchia Ondato  | Supposed to have been first discovered in Egypt in Augustus's reign. Dark green, with lighter green marks, mixed with a yellowish colour, always orbicular.                                                                                                                                                                                   |
| Lapis Tiberianus | Verde Ranocchia Fiorito | Quarries in Egypt. A green ground covered with fine white veins. Used also by the Romans as an amulet against headache and serpent bites (Pliny, N. H. Lib. xxxvi., cap. 11).                                                                                                                                                                 |
| Lapis Atracius   | Verde Antico            | Quarries are said to have been near Atrax, ten miles from Larissa, on the River Peneus, in Thessaly.<br>The celebrated Verde Antique. A green paste, in which there are fragments of black and white. The most beautiful large specimens of the emerald green sort are table tops at Dorchester House. The rarest is said to have blue in it. |



## SERPENTINES (continued).

| Latin Names.        | Italian Names.                       | Notes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Amiantus .....      | Amianto .....                        | Asbestos, from which shrouds were woven, so that when the body was consumed the bones might not be lost. It is said to have been originally found in Cyprus, but is now found in many parts of the world,—Savoy, Corsica, Cornwall, Scotland, and the United States. Vulgarly called by the Italians "Wood of the Cross" and "Feathers of the Holy Ghost."                                                                                                                                                                |
| Equipondus .....    | Pietra Nefritica .....               | A hard compact stone of dark green colour, used by the Romans for weights, in which case one or two rings were leaded in. Two may be seen at the Temple of Diana at Nimes.                                                                                                                                                                                                                                                                                                                                                |
| SLATES.             |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Ligusticus .....    | Lavagnone .....                      | Slate. Although these were occasionally used for works of art, I omit them.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Thebaicus .....     | Lavagna Tigrata .....                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| SPAR.               |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| urra .....          | Spatio finore .....                  | Flint spar (commonly called "Blue John"). According to Corsi, and this agrees with the ordinary description, the covering and stopping with shellac and gums gives the perfume; and the softness answers to the description. Pliny says it was first introduced to Rome by Pompey in his three triumphs over the Pirates and the Kings Mithridates and Tigranes; and that it came from the empire of the Parthians and Carmania, i.e., from Tartary and Persia. Modern geologists say it is a variegated agate or jasper. |
| BASALTS.            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Basanites .....     | Basalte Propriamente detto .....     | Basalt from Ethiopia. Said to be so called from Basal, the Ethiopian for "iron;" black, coffee coloured, and green. Has been used for columns and statues.                                                                                                                                                                                                                                                                                                                                                                |
| Lydius .....        | Pietra di Paragone .....             | "Touch stone" for trying the precious metals. A sort of basalt, said to be from Lydia.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| PUDDING-STONES.     |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                     | Pudinghi .....                       | "Pudding stones," breccias of pebbles in a hard paste, mostly silicious. "The green breccia of Egypt" is one containing pebbles of porphyry, granite, basalt, and quartz, in a green paste. Some have the paste of purple, and of grey. Sometimes called by the Italians Breccia fruticcolosa or fruity breccia. Messrs. Farmer and Brindley have a fine specimen of the green breccia of Egypt. The quarries were found by Mr. Brindley between Kossier and Koft, near Hamamat, in Egypt.                                |
| PORPHYRY.           |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Porphyrites .....   | Porfido Rosso .....                  | Porphyry, called so from its purple colour. Main quarries in Egypt, near the Red Sea, called Thebaic stone. Called leptosphephos, or small stoned, by Pliny, from the white specks, or spots, in it, and by Byzantine writers "the Roman stone."                                                                                                                                                                                                                                                                          |
| "                   | "                                    | Fragments of red porphyry columns are found at Caracalla's Thermae, and in front of the Basilica of Maxentius, Quarry now worked by Messrs. Farmer and Brindley, near Geb Duchan.                                                                                                                                                                                                                                                                                                                                         |
| "                   | "                                    | "Black Porphyry," with white spots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| "                   | "                                    | "Grey Porphyry," spotted with circular white and square black marks.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| "                   | "                                    | "Green Porphyry," a sort of invisible green, with white spots.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lacedaemonius ..... | Porfido Verde detto Serpentino ..... | Green. Vulgarly called by the Italians Serpentine. From Laconia, in the Peloponnesus. Always of small dimensions; mainly to be found in pavements of Opus Alexandrinum and in inlays. Signor Boni sent me a piece from Aqueleia that had been subjected to fire when the town was burnt by Attila, which had become red. The colour is a deep yellowish green, with fragments like almonds of a lighter colour.                                                                                                           |
| Memphites .....     | Serpentino Bigio .....               | Grey porphyry. Said to come from Memphis, in Egypt. Grey, with black spots.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| GRANITE.            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Pyrhopocilus .....  | Granito Rosso .....                  | Red granite from Syene, now Assouan, on the Nile. Of this are the red columns of the portico of the Pantheon, of the Thermae of Caracalla and Diocletian, and Pompey's Pillar at Alexandria.                                                                                                                                                                                                                                                                                                                              |
| Psaronius .....     | Granito del Foro .....               | Called Psaronius from being spotted like a starling. Grey granite from the Claudian Mount in Egypt, near the Red Sea.                                                                                                                                                                                                                                                                                                                                                                                                     |
| Syenites .....      | Granito Bigio .....                  | No. 7. Monoliths of the portico of the Pantheon, columns in the Forum of Trajan, and those in the Trepidarium of Caracalla's Thermae, and the one in the square of Sta. Trinità at Florence. The Italian name is said to be from the columns in the Forum of Trajan.                                                                                                                                                                                                                                                      |
| Hethiopicus .....   | Granito Nero .....                   | Grey granite, said to come from the famous quarries at Syene, on the Nile.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                     | Granito Bianco e Nero .....          | Black granite from Ethiopia.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                     | Granito Verde .....                  | Syenite, black and white.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Judaicus .....      | Granito Grafico .....                | Site unknown. Green granite. Some has been lately found in Sweden, I believe. Quarries between the Red Sea and the Nile, between Keneh and Kossier, close by the quarry of the Breccia Verde. White with black markings that look at a distance like Hebrew writing.                                                                                                                                                                                                                                                      |
| Ligusticus .....    | Granito de Genova .....              | From near Genoa. A greenish granite.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                     | Granito dell' Isola del Giglio ..... | From an island off the lower part of Tuscany. A purplish granite.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                     | Granito dell' Elba .....             | Grey granite from Elba. Used by the Romans; but not mentioned by any writer.                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## THE ARCHITECTURAL ASSOCIATION.

THE tenth meeting of this Association for the present session was held on the 1st inst., in the meeting room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (resident) in the chair.

The following new members were elected, Mr. W. Fitzmaurice, E. C. Cockburn, and F. L. Rossignol.

Mr. W. Burrell was elected to fill a vacancy on the committee.

It was announced that the first "Common room" meeting would be held on March 12, in the room downstairs. These meetings would be on, and their object was to cultivate good-fellowship. The subject for discussion would be Travelling Students,—their artful ways and tricks.

The Chairman said he was sorry to inform members that on the 26th ult., at Hyde,

near Winchester, passed away their esteemed Vice-President, Mr. Charles Richard Pink. Having been recently President of the Association, Mr. Pink was more or less well-known to them all, while to those who had the privilege of closer fellowship with him, the loss was unspeakably sad. Mr. Pink succeeded the late Mr. Sharpe as organiser of the autumn excursions, and from the year 1876, when Mr. Pink undertook that work, and organised the excursion at Winchester, down to 1885, the success of those meetings depended largely upon his exertions and popularity. Mr. Pink was peculiarly adapted for giving enthusiastic support to movements of the sort. He had a most happy knack of making friends. He was also one of the most rapid and prettiest sketchers he (the speaker) had ever come across. Being unfortunately cut off at so early a period of his career, Mr. Pink had not had many great opportunities of displaying

the wonderful knowledge he had of his profession; but those who had seen his work knew what exquisite refinement there was in its detail, and would recognise how much the profession had lost by his untimely decease. He had attended Mr. Pink's funeral that morning as representing the Association, and had conveyed to the family the deep and earnest sympathy of the members in their bereavement.

A vote of condolence was passed, and ordered to be forwarded to Mr. Pink's relatives.

Mr. J. T. Micklethwaite, F.S.A., then delivered a *visa voce* address on "The Life of an Old Parish Church." He said that the subject was one about which he had often talked to archaeologists and others, but never before an assemblage of architects, though it was a matter which had its strong architectural side. What he chiefly wished was to make them appreciate the value of old



churches, not merely as piles of stone, but as living things. He had chosen a typical parish church for this reason. They were apt to lump all old churches together, and speak of them as if they were the same; but there was one thing about parish churches which made them specially precious,—that whereas the great abbey churches were nearly all the work of rich corporations, or of men of high social position, the parish churches were specially the product of the people. Furthermore, they were as a rule far older than the monastic churches, the fact being that it was impossible to say how old they really were. They knew something about the foundation of most of the monastic and collegiate churches. The largest number of those were founded after the Norman Conquest, but at that time the old parish churches were in existence, and although now they showed externally work principally of the fifteenth century, internal evidence of very much older work was generally to be found, and it was his desire that evening to show them how to look for it (applause). The history of the English church began with the advent of the English into Britain, but prior to that there existed the old British church, which seemed to have been pretty widely distributed. The Romanised Britons were practically a Christian body, while the Britons who had maintained their independence were altogether Pagan. The Christians in those early days must, therefore, have had some sort of places to worship in. He was afraid it could not be proved that any such existed still, but there was little doubt that many of the present parish churches stood on sites which were so occupied even before the coming of the English into this country. The early Christianity of the southern part of Britain was undoubtedly wiped out at Anderida, but in Wales and Cornwall, which were never Anglicised as were the other parts of the country, Christianity must have continued, and, of course, where Christianity existed there could not fail to be churches for the worshippers. When the early missionaries came from Rome, they found the remains of those old churches, but they were not the same as those which the missionaries built. Some remains of the latter were still to be seen, such as the churches at Hexham and Ripon, built by St. Wilfred. In such instances they saw church of the definite basilican type. The lecturer here showed a plan of Brixworth church, built after the Italian tradition, adding that at Peterborough there had lately been found the remains of a church of the seventh century, identical, he believed, in plan with that of Brixworth. There was nothing like that plan to be seen in the parish churches now. While the monks were busy building their monastic churches another set of men were at work, all over the country, namely, the Celtic missionaries from Ireland and Scotland. The plans of the Celtic churches were entirely different from those of the basilican type, in proof of which he exhibited the plan of the monks' houses and churches at St. Michael's Rock, which were merely in the form of a square cell internally, and beehive shaped externally. In Ireland the next step was to be found, viz., a square building with a small chancel joined on, and with a very narrow arch of about 3 ft. across. More than one half of our parish churches could be traced back to that type, as instances by the plan of Boarhunt, a Saxon church. Although, therefore, the monks and the court followed the fashion introduced from abroad, the people, when erecting churches for their own use, followed the type of the Celtic builders. In course of time the types would mix, the churches became thoroughly national, and, there being no further importations of foreign missionaries, all the new churches were built by the people. The arch still continued to bother them a good deal; they could make a good span in wood, but they hesitated about throwing any great width of stonework without something to support it; the aisles also seemed to have dropped out. Wherever a church resembling a basilica was found, it showed that it was an early church, built under the missionary influence. They would also notice that good architectural work generally meant early work in Saxon times. The lecturer then exhibited a plan of the church in Dover Castle, showing the next step towards a cross church. That appeared to be the shape which was common for the largest churches about the time of the great architectural revival, which took place at the

time of the Norman Conquest. Nearly all the town churches were to be traced back to that type, and the smaller country churches to the Celtic or Irish type.

Mr. Mickelthwaite then pointed to the plan of the church of Wakefield, which he took as a typical example, showing the changes that many churches had undergone. The plan of the church at first was almost identical with that of the church in Dover Castle. It was built about the year 1,100, and it had not long been erected before the good people of the town thought it was not large enough. They therefore added an aisle on the north side, because in those days they were wont to bury on the south side of the church. Then, in the thirteenth century, the church was enlarged by another aisle being built over the grave-yard. In adding these aisles they rather cut into the supports of the tower. Norman work was generally badly built, the masons in those days working on the remains of a tradition which had come down to them from the Roman times. Nearly all the Norman towers had since tumbled down, and there were historical notices of the towers falling at Ely and elsewhere, and those of Chichester and Peterborough had gone in our time. It was evident that the same sort of catastrophe happened at Wakefield, and the place having become a complete wreck, it had to be rebuilt, and the walls were raised and the church made more dignified and lofty. Then came the great visitation of "The Black Death," a plague said to have cleared off two-thirds of the population of Europe, and which stopped building. Fifty years after the plague, however, it occurred to the people of Wakefield that it was time their church had a tower, like those of other towns of equal importance. At that time tower-building was a slow process, taking sometimes as much as one hundred years or more to complete. Had they placed their tower, therefore, in the old position,—in the middle of the structure, it would have interfered seriously with the daily use of the building. They therefore built it at the west end, and when it was carried up clear of the roof, they joined it on to the church, so that a plan of a church with a tower in the middle became that of a church with a tower at the west end. By this time they had taken away their west window, and the church being darker, they built a clearstory. Afterwards, having perhaps more money to spend, they began by pulling down the chancel, and re-building another chancel, with lengthy aisles, the full width of the projection of the transepts. The cruciform shape had now disappeared, the only thing remaining of the old church being the ancient Norman stair of the turret in the transept. The church by this time had the appearance of a basilican church, though it was in no way derived from that form. The point he wished to impress upon them was that he thought they had got a church which had been growing for over 400 years, though people would tell them that its date was of the fifteenth century. In fact, that church was not an exception, for nearly every parish church, with a similar plan, had gone through a process as complex as that at Wakefield. He would like to say a word as to what should be done with such a church. But the story did not stop at the end of the fifteenth century. The fabric generally remained of the shape it took at the commencement of the sixteenth century, but many a church had been played tricks with, by sticking up galleries and taking them away, and by putting burial vaults under the foundations of the principal pillars. Then would come some learned architect, who would say, "This is a fourteenth-century church, but unfortunately some Perpendicular rascal has put a window there. Take it out, and put in one of the period" (laughter). Then the architect went on, until he left nothing of the original history of the church, which became a nineteenth-century one of his own making. Many good architects had done that, and when any of his hearers had churches to deal with, he hoped they would begin by trying to find out what was the old story of the church (applause). The story was as interesting as the beauty of the building; and the duty of any architect who had to manipulate it,—he would not use the horrid word "restore,"—was to find out its history. Furthermore, there was the matter of the arrangement. People had gone on altering churches to suit their needs, and they had a perfect right to do so. All he contended was that in making those changes, which they might honestly do to suit their wants, the

records of the older wants should not be obliterated, because those had of themselves a very valuable and interesting history. Indeed, when once the true story of a building was grasped, he did not believe any one of them would willingly take anything from it, though they might add to it. Then came the difficulty as to how they were to add. If a church had lost its tower, or had a miserable one, and it was desired to erect a new one, as in the case of Long Melford, the old school and architects would deliberately set to work to imitate the older church, and try to make believe that their nineteenth-century tower had been built by John Clopton and his friends in the fifteenth century. That was exactly what ought not to be done. They had not the same facilities now for dating their buildings as the old builders had, because now-a-days we had no traditional style. The new work ought to show that it was distinctly modern, and if such work was added to honestly meet the requirements of the times, they were adding legitimately to the history, and the value of the buildings, without taking away from it (applause). If they took the old building, scraped it over, and made it spic-and-span, it would not add much to the use of the church, nor would it do so to knock out the large fifteenth-century windows, put in originally because more light was required, and set in their place little narrow lancets to keep the light out, sticking in some beastly stuff called Cathedral glass, which made the place look like the Brighton Aquarium inside (laughter). Alterations of that sort were always mischievous, while alterations that honestly represented wants were good. Those good people, who were always crying out against touching an old church,—and he was glad to say they were generally getting converted,—entirely forgot that they were stopping the process by which the old church obtained its history and interest. He would like to say a word or two about old furniture, because now and then one came upon odd bits, and did not know what to do with them. The best course was to leave them alone. Should they fall in with a window with a few little bits of glass, they should not allow the parson to have them cleared out, and put into a small window in the vestry. They should be left where they are. They would not be of any great interest to a man who had seen thousands of better pieces in other places, but they would be interesting to the people who went to their own church. It was the same with many other things; if they were not in the way, let them remain just as they were. It was quite another thing if they were wanted for use. An old and rickety lectern might be mended. On one occasion he went to Derbyshire to see a curious old font, but in its place found a new one very carefully copied from the old font. The parson knew nothing of what had become of the old one, but no doubt some architect had been there,—he only wished he knew his name, for he would tell it (laughter).—and had "restored" it. Then doubtless the contractor, finding there was a decentish piece of stuff at the bottom, used it for walling, and so it disappeared, like many other things. Some things were so far broken that they could not be used without being mended, while there were many things that were not wanted now. For instance, he had seen a fine Easter sepulchre, on which somebody had spent a lot of pains in putting new cusps and other things, which made it not a bit the better, nor did it add to the use of the church. It was a monument of the past, but its use was gone, and, therefore, why could it not be left alone to tell its story? The same thing applied to tombs. They were not things of use, therefore let them be left as they were. He held that within proper rules it was right to remove such things, should they interfere with the proper use of the church, but it should be done carefully. An old monument was a thing that should be taken as a whole, and not out down, as at Westminster Abbey, where some comical effects were to be seen, because the part of Hamlet had been "restored" out of the piece. The real difficulty about mending an old church was in the case of the fabric being almost worn out, and he had seen instances where architects of good name had said, "You cannot do anything with it; you must pull it down." At first sight he had been rather inclined to agree with them, but, as a rule, he found it worth while to mend the fabric. Some little time ago he had



the experience of an example of Early English work, built without foundations, which had gone over, but all the walls of any value were pretty good. Two men of good repute had condemned it, aided by one of the very best builders; but he had the pleasure of seeing the builder set to work to make it right, and now it was stronger than ever. Such things were usually only a question of trouble. He therefore wished his hearers, when old churches were out of health, instead of doing away with them and erecting new ones in their stead, to set to work and put them into good health once more (applause).

Mr. Alexander Payne proposed a vote of thanks to Mr. Micklethwaite, and congratulated him on the way he had developed his subject. He had come in somewhat late, and he wondered whether the lecturer had mentioned some of the old British churches in Cornwall, such as St. Perrin's, which had been buried in the sand since the fourth century, or St. Constantine's, on the Cornish coast, which were nearly like the early examples mentioned by the lecturer, except that the division between nave and chancel was less marked. The development of the church had pursued two courses. In the East it seemed to have taken the form of the Greek cross, as in St. Sophia, from which the Mahomedans had got their mosques and the Russians their modern type of church. In Western Europe, again, it seemed to have taken the form of a parallelogram, derived most likely from the basilicas. At the fine old parish church of Shifnal, Salop, with which the speaker was well acquainted, almost exactly the same development had taken place as at Wakefield, except that the tower had not been moved from the centre. Mr. Micklethwaite's remarks on the vexed question of restoration were admirable. No more harm could be done to a church than by the man who had a mania for some particular style. He did not know any country in the world which possessed such parish churches as England did, with so many characteristic and varied features. Indeed, the wealth of genius shown by our ancestors in designing splendid buildings was one of the things architects had more reason to be proud of than anything else in their country.

Mr. F. T. W. Goldsmith, in seconding the vote of thanks, said it would have been interesting if they had been told how the church grew as the wants and faith of the people changed and the ritual became more elaborate, followed by a demand for an increased number of chapels. It seemed to him that the real type of the parish church was the basilican form. In the ninth and tenth centuries the Norman and English plans were almost identical, and then the change took place, for with the Norman invasion the English plan entirely altered, and the new plan of Canterbury Cathedral was almost the same as that of St. Stephen, in Caen. In later ages there was a tendency to revert to the early basilican arrangement. He did not quite agree with Mr. Micklethwaite as to restoration. Though much had been done in the past to damage old churches, at the present time architects were very careful as to how they treated them.

Mr. Henry Lovegrove said he supposed Mr. Micklethwaite would not ask them to spare anything inserted in a church between the reformation and the present time, unless it showed distinct artistic style?

Mr. N. O. Nisbett remarked that he had carefully measured the church at Eastbourne, which appeared to have followed the lines laid down by Mr. Micklethwaite.

Mr. Sydney B. Beale said that the west tower formed a very useful part of the church, and no doubt that weighed heavily with the Medieval builders in altering its position, and placing it where its ground story could be of use. The architects of the present day were not all antiquaries; they had very serious work to do, viz., to earn their living, while it required almost a lifetime to appreciate and go into the story of every building.

Mr. C. H. Brodie hoped Mr. Micklethwaite would not go away with the idea that the members were such Philistines as Mr. Beale appeared to be (applause).

The Chairman asked Mr. Micklethwaite the best way to look for the old work.

The vote of thanks was then put, and carried by acclamation.

Mr. Micklethwaite said, in reply to the last question, that a man had to learn it for himself, there being no book that could teach him. His general advice was not to bother about the out-

side of the church, but go inside, and trace its plan, looking narrowly at the bases of the pillars, and finding out how the plan became complicated. With regard to its being an antiquarian question, one good gentleman had said they had to earn their living, and had not the time to fritter away in careful archaeological study. But what would people think of surgeons who said,—"We have our living to get, and so we cannot waste our time studying anatomy" (laughter). It was the architect's duty to qualify himself for dealing with old buildings by knowing all about them. He did not agree with Mr. Lovegrove that it was their duty to take away from a church everything which had been put up since the Reformation. English history did not stop at that particular epoch, and many of the things people sought to remove were those which they should be careful not to destroy. Why, for instance, should the harmless lion and unicorn, or the table of benefactors, be turned out? Classic churches were deeply interesting, as were the Classic alterations to old churches, and where a church, even of the Georgian times, showed good work, it should be preserved (applause). He might have said a great deal about the ritual of the Church. Every alteration was made for the use of the times, which were continually changing. Everything in the service helped to develop the church, and it should be remembered that the churches in the Mediaeval ages were more used than they now were, being then utilised as the Mechanics' Institutes, the Clubs, and the Architectural Associations of the period (laughter and applause).

#### FREE LECTURES TO ARTISANS AT CARPENTERS' HALL: ENGLISH FURNITURE OF THE EIGHTEENTH CENTURY.

PROFESSOR G. BALDWIN BROWN, M.A., Edinburgh, delivered the third \* of the present series of free lectures, under the auspices of the Carpenters' Company, on Friday evening, February 22, his subject being "English Furniture of the Eighteenth Century, as illustrating the Classical Revival." In the absence of Sir J. C. Lawrence, Bart., Mr. Edwin Lawrence presided, and there was a large audience.

The lecturer said he would speak of his subject from the general point of view as illustrating the taste in design and ornament that prevailed at different periods during the eighteenth century, and not from the technical standpoint. He approached the subject from the more general and artistic side, dealing with the broad aspect of the productions of the craft of our famous cabinet-makers, rather than with peculiarities of make and material. The famous English makers and designers of furniture of the eighteenth century were, first and foremost, Thomas Chippendale, who flourished in the early and middle portion of the century, and later, Heppelwhite and Sheraton. With these they must associate the names of the distinguished brothers, Robert and James Adam, who were among the leading architects of the latter part of last century, and who were accustomed to design not only the exteriors of private dwellings, but also every detail of the interior decoration, including the furniture, and even the silver and glass to be used. He thought it would be best to begin by forming a general idea of the work of these designers and makers, and for this purpose he exhibited a series of examples by means of the limelight. In passing, he noticed the differences in style of design and ornament in different periods. Proceeding, he said that when one compared the work of these men with that which was turned out to-day in the ordinary course of business from our workshops and factories, one noticed that Chippendale and his companions and successors were artists,—that was to say, each piece they turned out had been the subject of individual study. The general style and motive of each had been thought out, and then this particular motive had been carried through the whole design. The ornaments were not a mere haphazard collection; they were all intimately related, so that the whole piece was harmonious throughout. Very often the motive was not happily chosen, but it was always selected deliberately and for some reason. It was not mere fashion or routine that determined the forms, but the artistic taste and fancy of the maker. Then,

\* For reports of the previous lectures, see *Builder*, pp. 109, 127, 148, ante.

secondly, this taste and fancy had been controlled by sound judgment, which prescribed that considerations of use and of comfort should have equal weight with those of appearance. The chairs were roomy, solid, and inviting; the tables stood firm, and bureaux and writing-tables, &c., were conveniently arranged. The designs of chair-backs were very varied, but they were so contrived as to preserve a certain indispensable minimum of solid material. They did not sacrifice construction to elegance or ornament. Then the lines in themselves were well considered and carefully drawn and composed. The curves were not struck by the compass, but were subtle and varied. Chippendale's chair-backs were pleasing as designs merely from their composition of lines. The material and workmanship was also excellent. Two phases of ornamental art were well marked in the examples they had seen. There was a delight in soft and flowing curves, and a tendency towards exuberance in ornament. Then there was a satisfaction in straight lines, and simple, though graceful, adornment. The first was best illustrated in Chippendale's florid designs for beds, cabinets, and mirrors; and the second in the work of Sheraton and Adam. This difference of style was not only marked in English furniture and decoration. It represented an artistic movement affecting European taste in general, the headquarters of which were in France. During the eighteenth century French taste in ornamental art had a very large influence over the taste of Europe in general, and it was to France they must look to understand the significance of this artistic movement. The history of decorative art in France proceeded by certain well-marked stages,—from the time when the art of the Italian Renaissance was introduced into it in the first half of the sixteenth century, to the period of the first Empire of Napoleon Bonaparte, in the early part of the nineteenth century; so they had about three hundred years during which decorative art in France greatly flourished and almost dominated the art of Europe. The character of the art of the Italian Renaissance, transported to France early in the sixteenth century, was very much what Classical decorative art had been in the days of the Greeks and Romans. The human figure was largely used, and with that they had the conventional leaf and flower ornament. In the best Classic and Italian work these forms of decoration were used sparingly, and with a proper attention to the choosing and the placing of them in relation to the character and the structure of the object to be adorned. Then there was also a freer, lighter style of decoration that appeared both in Classical times and in the times of the Italian Renaissance, in which grotesque figures, human and animal, birds and beasts of all kinds, objects such as vases, candelabra, columns, garlands, tufts, bouquets, &c., were spread lavishly over the surface, to be decorated with the liveliest fancy, and often with the most elegant taste, but without the method and severe economy of the more dignified work just noticed. This lighter style of decoration was seen especially in the adornment of Roman and Pompeian houses. It was copied in Italy in the sixteenth century, especially by Raffaele in the Loggie of the Vatican. Both these forms of decoration were brought to France, where they found figure-work with conventional foliage, and also the lighter grotesque or arabesque decoration, done in the first place by Italian and then by native French artists. The reign of Louis XIV. (1643-1715) marked the period when the decorative arts in France reached their greatest height of splendour. He was the most powerful, the most despotic, of European sovereigns, and the greatest lover of pomp and show. His expenditure on works of art in the precious metals was something fabulous. Not only were magnificent lustres, sconces, lamp-stands, and the like, constructed of silver in the State factory of the Gobelins, but what was generally made of wood in objects such as tables, chairs, and couches, was executed for the "Grand Monarque" in this precious metal. In his throne-room at Versailles were to be found a silver throne 8 ft. in height, a silver chimney-piece, and tables and *guéridons* (lamp-stands) of the same material. A balustrade of silver, 2 ft. 6 in. high, fenced off the bed in the royal sleeping-chamber. With all this profusion and luxury, the artistic forms employed in the Louis XIV. period remained essentially the same in character as those of the Italian and French Renaissance. They were Classic in



type, and were employed with a certain feeling for grandeur and dignity, which preserved considerable severity and decorum throughout the style. To this magnificent period, when wealth and luxury had not yet undermined the dignity of the decorative arts, succeeded the period known as that of Louis Quinze. This was a time of dissipation and frivolity, when restraints of all kinds were relaxed, and when art yielded to the prevailing spirit of giddiness and licence. Decoration by figure-subjects was still in vogue, and the paintings of Boucher and his school, though excellent in decorative effect, were in motive light, and even licentious. But what chiefly characterised this period was a certain style of ornamentation known as Rococo, made up almost entirely of curves and flourishes, often very florid and fantastic, but at the same time beautifully composed and pleasing to the eye. The contrast of this ornamentation with that of the preceding period was most marked. In the Classical style and its derivatives down to the time of Louis XIV. the ornamental forms employed always had some meaning. They might be human or animal, conventionalised leaf or floral forms, or bands and twists derived from textiles, but they were all copies, more or less distant, of natural objects, and were used with some intelligent sense of what they were and what they signified. In this Louis XV. period, any constraint of this kind was quite thrown off, and the Rococo ornamentalist spread his lines and curves in perfect freedom and abandonment over the surfaces to be adorned. The only natural objects recalled by Rococo forms were shells, and this fact gave the key to the origin and popularity of the style. It was a fashionable folly of the time to have rustic grottos lined with shells and supplied with fountains, statues of nymphs, &c. Not only were these to be found in gardens and basements, but also in connexion with suites of living-apartments. The vogue attained by these fanciful structures led to the adoption of these characteristic rustic and shell-like forms for ornamentation generally, so that Rococo was really a rustic or shell-work run wild. Passing on, they came to the third style—that of Louis Seize. This represented a reaction against the excesses of the Rococo style of Louis XV., and a return to the abandoned Classical forms of ornamentation. The contrast between Louis XIV. and Louis XV. style was not greater than that between the style of Louis XV. and that known by the name of his successor. It was especially marked in the general character of forms employed. Then, lastly, they had the taste for Classical forms pushed still further into the excesses of the period of the Directory and the Empire,—indeed, the feeling for the Classical was carried to a most extraordinary height. This was actually the time when scientific interest was being awakened in the remains of antiquity. There was a return to the political and social ideas of the Classical world at the time of the French Revolution, and society masqueraded in Classical guise. Napoleon persuaded himself that he was a successor of the Roman Cæsars. The result of this rage for the antique in art was a somewhat stiff and affected use of Classical forms without much elegance and charm. Such were the well-marked stages by which decorative art progressed during the period they were dealing with. These same stages were marked in the English furniture of the same century. They had in it no Louis XIV. period, though the much-praised Queen Anne style, with its semi-Classical elegance, corresponded in time with the close of the long reign of the "Grand Monarque." But they found the Rococo in considerable vogue in the middle of the eighteenth century, and a most decided reaction in favour of antique forms as they approached the year 1800. That year there was what was called our "Classical revival." It was not pushed to such pedantic extremes as in the France of the Directory and Empire, but used with very fine skill and taste by the brothers Adam, and by furniture-makers like Sheraton and Heppelwhite. The same "Classical revival" was marked in ceramic art by the famous Wedgwood-ware, in the designing and ornamentation of which the sculptor Flaxman bore so large a part. Proceeding to inquire what significance this history had for our own time, and what reflections were suggested by the artistic movement he had called the "Classical revival," the lecturer said "Classical revivals" would occur from time to time so long as the decorative arts were

practised. A "Classical revival" meant a reaction from over-florid and meaningless ornament, and after every period when taste had become unduly free, and design careless or frivolous, they could safely look for a return to the purer models and the severer style of the antique schools. Simple, logical, rational—these words contained the secret of Greek decorative art. All decorative art which was of this character was so far Classical, though antique forms might not actually be borrowed. In a sense, Chippendale's simpler work was Classical, though he belonged to the period before the actual "Classical revival." He inherited the common Classical tradition of the Renaissance, but it was chiefly his thoroughness and consistency of work that seemed to carry his productions back to the age of antique art. On the other hand, Classical forms might be copied with the most rigid exactness, as in the French decoration of the Empire, while the work might miss entirely the true Classical charm. Antique ornamentation could take on different characteristics, according to the object to which it was applied. Severe and self-restrained when used in connexion with monumental structures like the Doric temples, it became bright, attractive, and fanciful in domestic life, or when employed on festal themes. The "Empire" style was too ponderous and formal. "Adam" decoration had a good deal of the Classical grace and cheerfulness; yet perhaps an interior carried out completely according to his own scheme would seem to modern eyes a little too pedantically correct, and too much a reproduction. It was not the duty of the modern designer to work out a "Classical revival" by a wholesale copying of Classical forms, even with the taste of an Adam or a Sheraton. "Classical revivals" should not be waited for till they were periodically forced upon us by the excesses or the carelessness of our artists and craftsmen. Artist and craftsman alike should learn to look upon the principles of Classical design as necessary daily food,—as a perennial source of artistic inspiration from which everyone should draw for daily use. For these principles were independent of special forms of ornament or systems of construction; they were based on immutable truths from which they departed at their peril. What were these principles? They had defined them generally when they called Greek decoration simple, logical, and rational. When a Greek set about designing, he considered (1) the general form of the object in relation to the use to which it was to be put, and the material of which it was to be made; (2) the structure of the object, and the choice and placing of the ornament in relation to that structure; and (3) the special character of the object as determining the decorative motives to be employed. Simplicity he secured by directness of construction, and a sparing use of well-selected decorative forms; while the logical and rational character of the ornamentation depended on the relation of ornament to construction, and the significance of the motives employed. The Greek methods of design and ornament were based on certain rational principles which all could comprehend and follow. There was no mystery, no necessity for special study. Let each one ask himself, "What am I making? How is it put together? What is its use when made?" and consider well what was involved in the answer to these questions. Such a one, if he acted on the suggestions he would thus obtain, would be treading in the footsteps of the Greeks, and would be working on Classical principles, whatever were the actual forms which he employed. The study of eighteenth-century art brought them, then, to the following result: They saw how good work in any branch, like some of Chippendale's, carried them back to the traditions of antiquity. They saw how a "Classical revival" followed of necessity on a time of licence and frivolity; but they might receive a more important lesson still if they got home the truth firmly into their minds, that the principles on which the Greeks worked were just as valid for us to-day as they were for the countrymen of Plato. If they mastered these, and referred back to them continually in daily work, they might be reaping the benefit every day of a true "Classical revival."

The fourth lecture of the series was delivered on the 27th ult. by Professor W. Ramsay, Ph.D., F.R.S., the subject being "The Ventilation of Buildings through their

Walls." Mr. J. T. Preston, Past Master, presided, in the absence of Mr. Charles Barry, F.S.A., F.R.I.B.A., and the attendance was again large. We are compelled to hold over our report of this lecture, as well as that of Mr. Banister Fletcher's lecture, delivered on Wednesday evening last, when Sir John Lubbock was in the chair, and there was again a good attendance.

#### DRAWINGS FOR THE ROYAL ACADEMY.

As in former years, we shall be glad to receive, and deliver at the Royal Academy on the appointed day, any drawings which their authors may wish to have photographed for publication in the *Builder* after the Academy Exhibition is open.

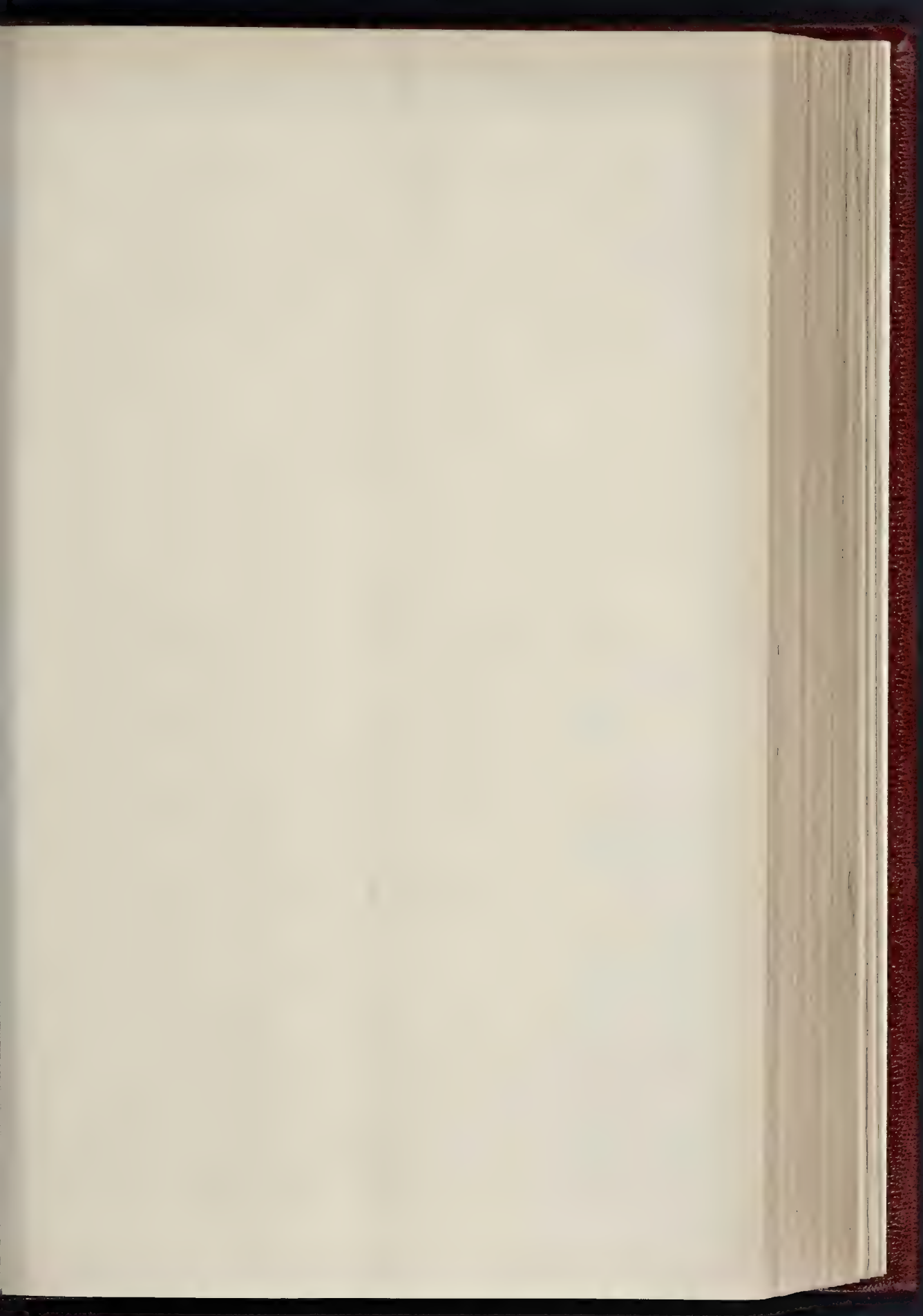
All drawings sent with this object must, however, be provided with a title label affixed at the back of the frame, and another attached by a string, in accordance with the Royal Academy regulations, and must be accompanied by the letter of description on the required form, addressed to the Secretary of the Royal Academy, and signed by the sender of the drawing in his own handwriting.

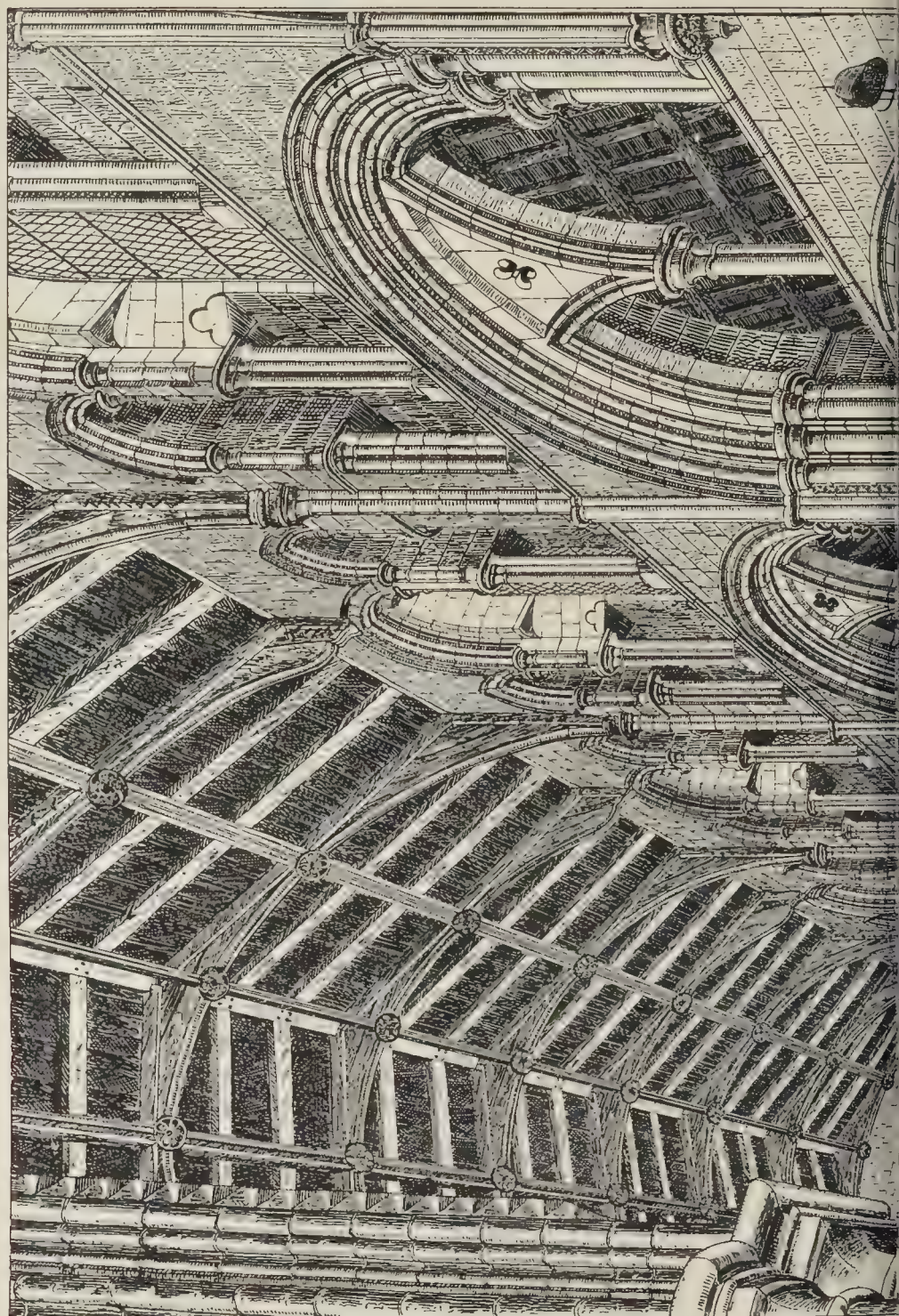
#### Illustrations.

##### THE TOWN HALL AT LINDAU.

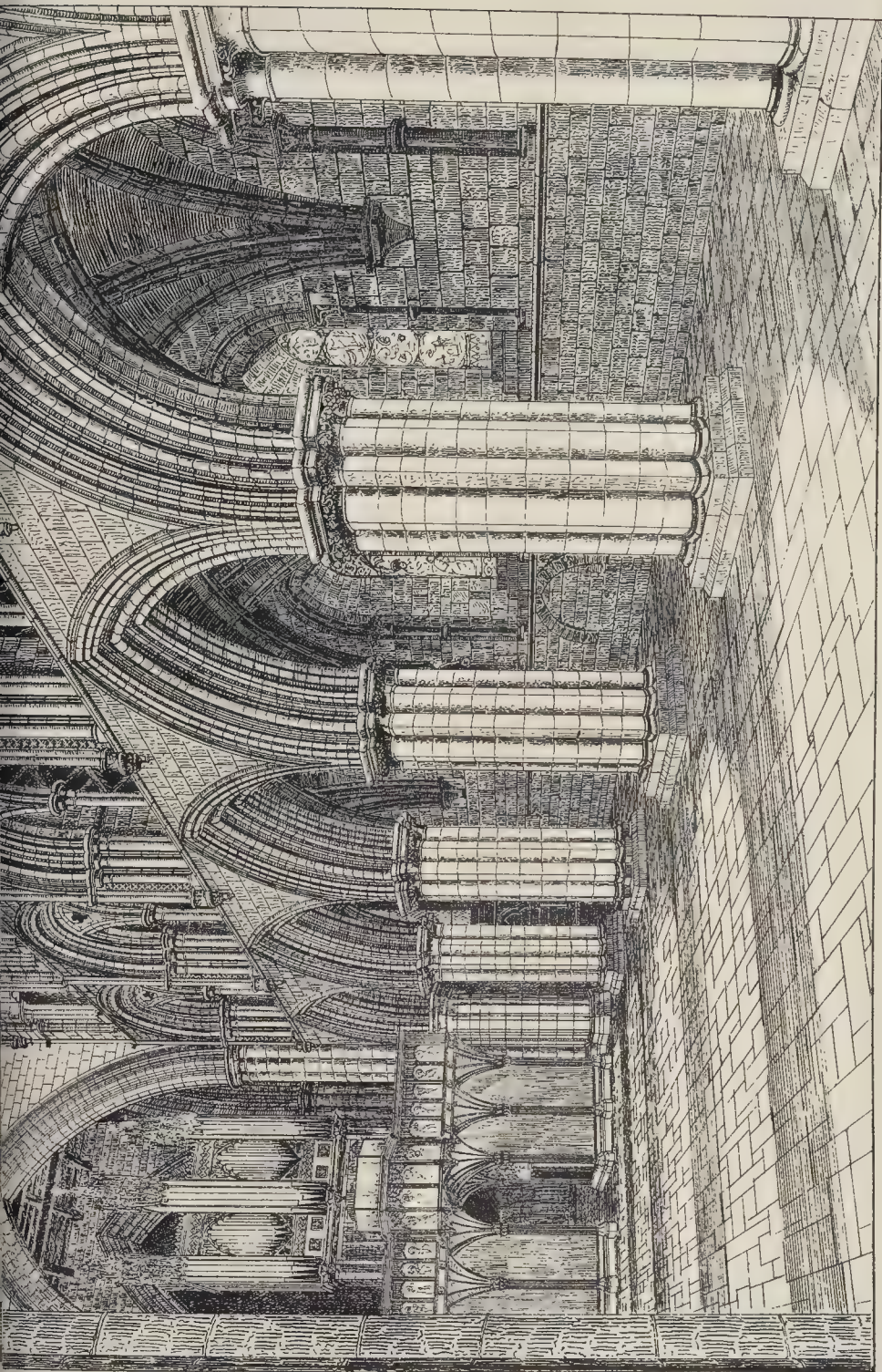
LINDAU is a small frontier town and fortress of Bavaria, and is built upon an island in the Lake of Constance, connected with the mainland by bridges more than 1,000 ft. long. The Romans under Tiberius are believed to have swept Lacus Brigantius with a fleet, and to have constructed a fort on this island, fragments of which are still standing. Certain it is that Tiberius and Drusus set out from hence on their expedition against the Rhodni and Vindelici. In 1275, Lindau became a free Imperial city; in the thirteenth century was the period of its greatest prosperity; and although extensive fires played havoc with its more important buildings, there is still much Romanesque and Gothic work left to interest any architect on a tour to or from the Tyrol. Among the best of these remains are the churches of the Barefooted Friars and of St. Peter, the Town Hall, the subject of this article, and certain quaint "bits" in various parts of the town. The Town Hall, erected in the years 1422-1436, stands free on all sides, three sides being bordered by lanes, whilst the front faces the market place. The dimensions of the building are 72 ft. by 51 ft., the longer sides carried up in stepped gables to a height of 81 ft. Originally, the north and south gable-ends were precisely alike; in each there was the central doorway with two windows on each side, next a continuous row of square-headed and mullioned lights, and then three, two, and one windows in the gable; in fact, very much like the south view we publish to-day, but, of course, without its ornamentation, although some surface decoration must have existed even then or soon after, because we read that the front was "again painted with pictures" in 1540. In that year the building underwent considerable alterations; the inside staircase was taken down, and the present outside one was erected. The general arrangement of this staircase so strongly reminds one of the one at Lubeck, which was built about the same time, that it is probable that the architect of the latter visited Lindau, and, taking note of what he saw there, reproduced the ideas on the banks of the Trave, but with such modifications as the more northern latitude of Lubeck required. In 1818 it was again restored, the façades were "splendidly" painted by Master Linderer, of Nuremberg, and the top of the northern gable received a new two-storied bell-cot. In 1724 the building was once more restored, the "restoration" apparently consisting in white-washing all the internal paintings and decorations. The exterior was suffered to remain as it was until 1865, when the northern face was very considerably altered for the worse, the southern one, however, being permitted to remain as before. Finally, in 1885, the German Consul at Corfu and two other gentlemen of Lindau agreed to pay for a thorough restoration, and the work was entrusted to Prof. F. Thiersch,







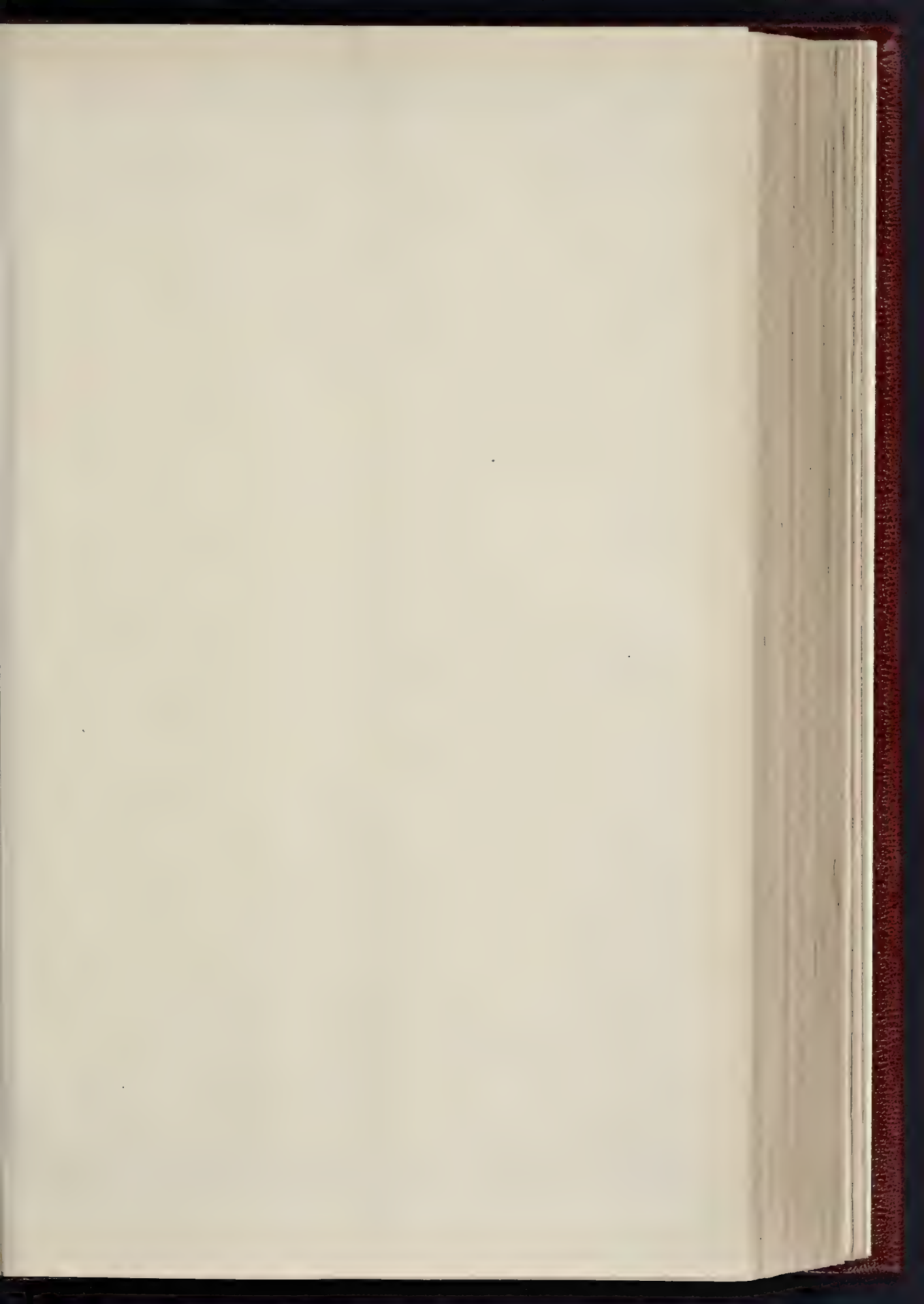


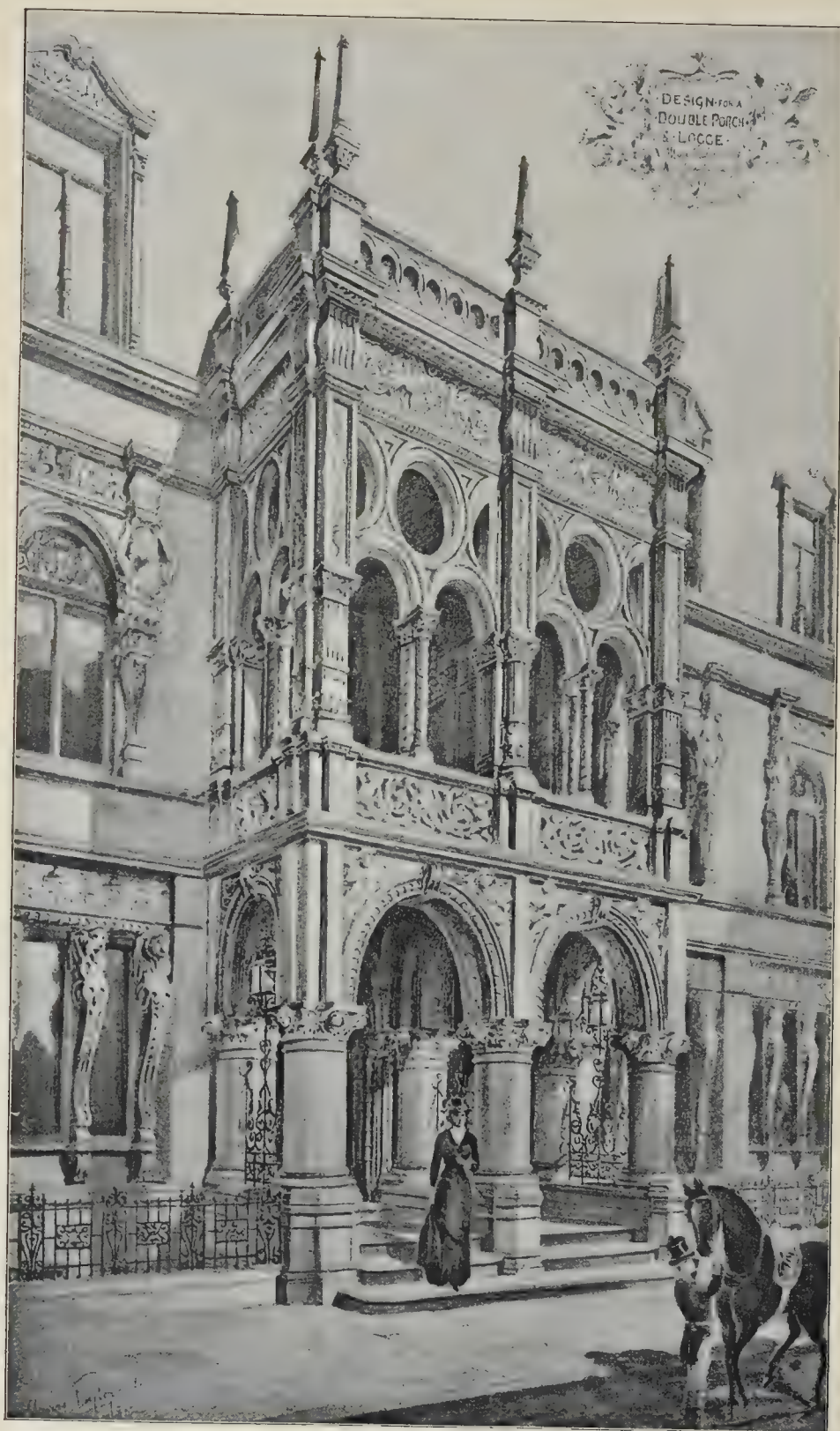


HEXHAM ABBEY CHURCH: VIEW OF THE CHOIR, LOOKING WEST.—DRAWN BY MR. C. CLEMENT HODGES.

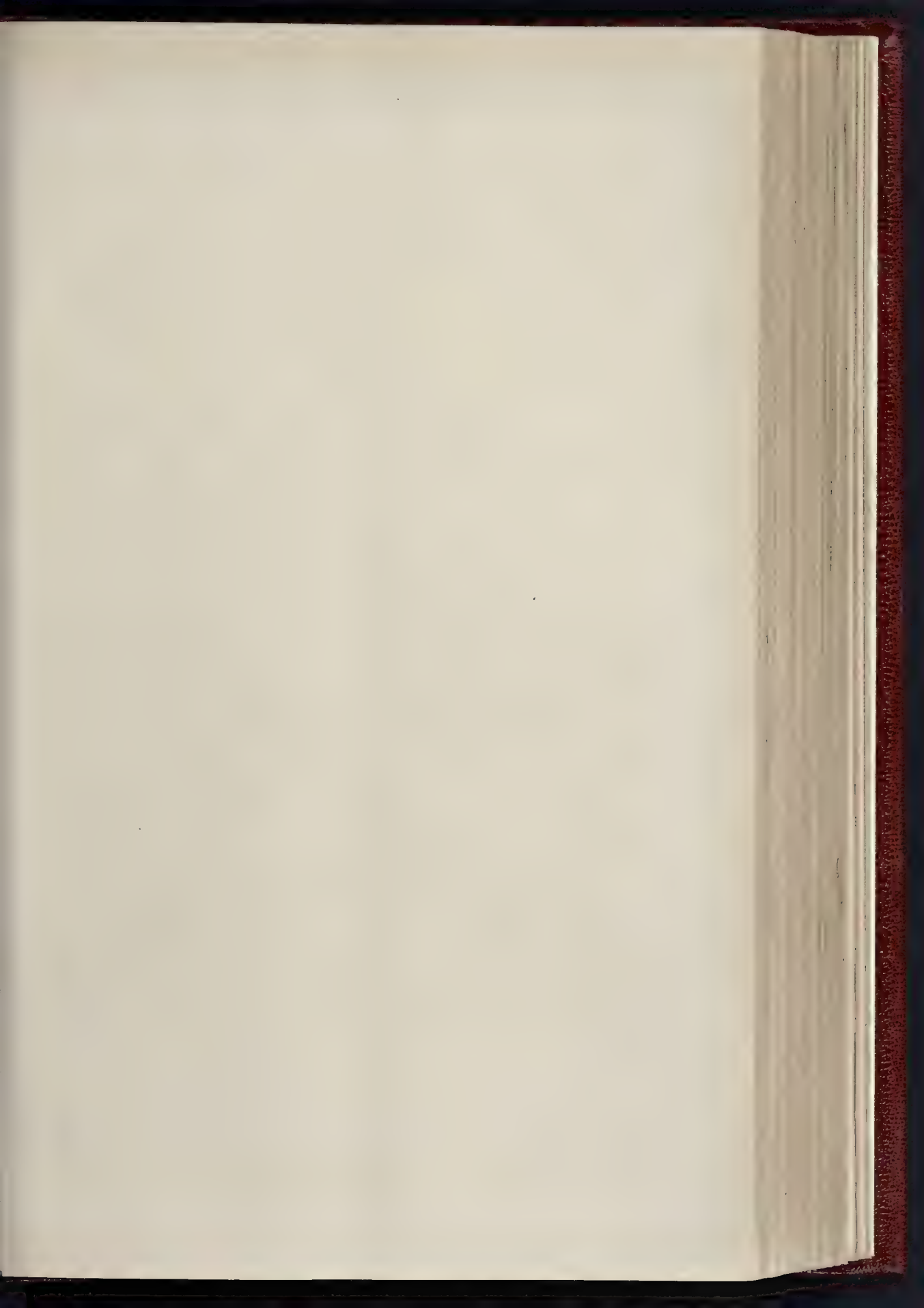














THE TOWN HALL, LINDAU, BAVARIA: AS RESTORED.—PROFESSOR THIERSCH, ARCHITECT.  
NORTH FRONT





THE PHOTOGRAPH BY SPRAGUE & CO., 22 MARTIN LANE, CANON ST., LONDON, E.C.

THE TOWN HALL, LINDAU, BAVARIA: AS RESTORED.—PROFESSOR THIERSCH, ARCHITECT.  
SOUTH FRONT







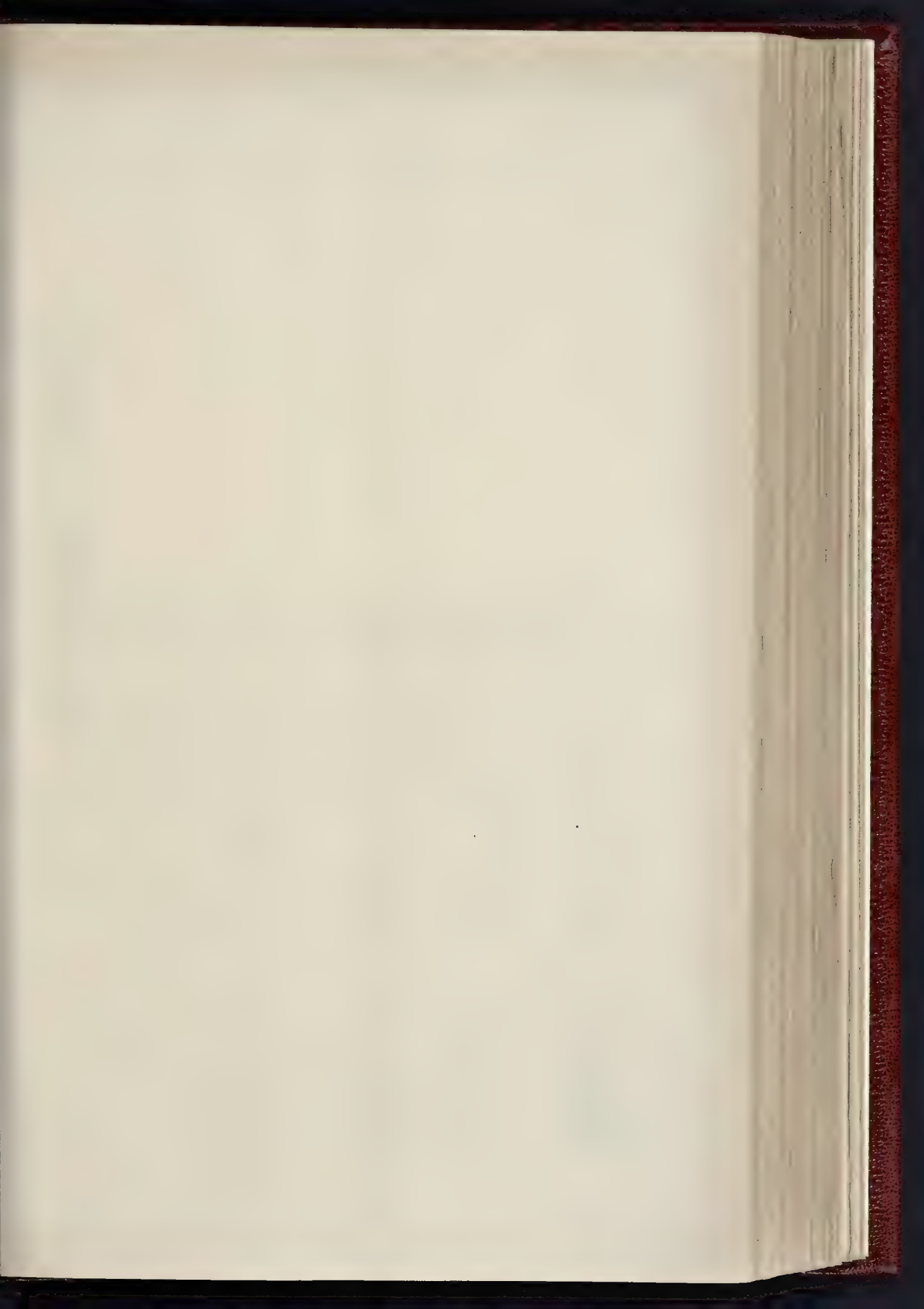
The Phototype Co., 363, Strand, London.

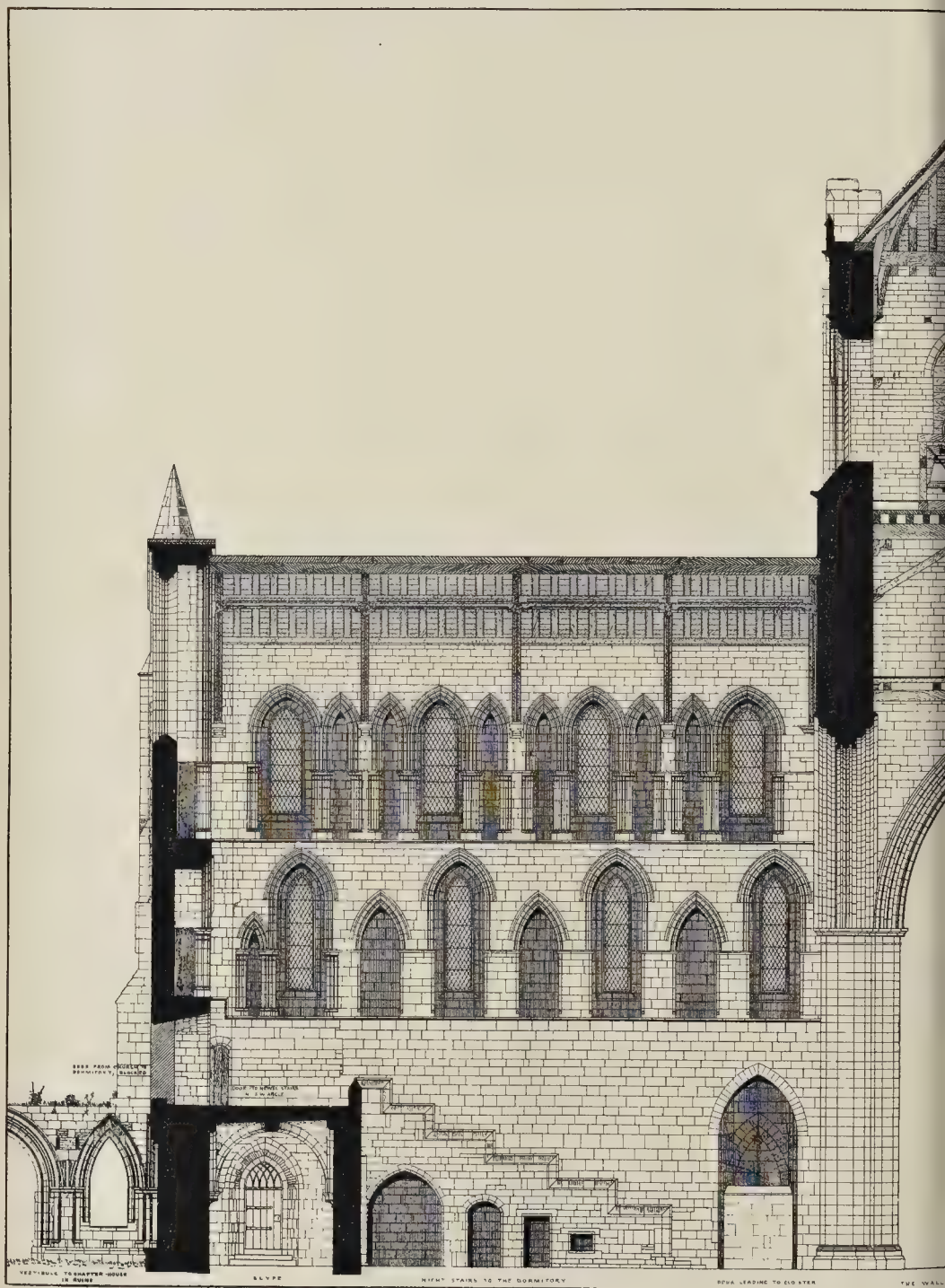
DESIGN FOR STAINED GLASS WINDOW.

By MR. J. J. WRATHALL.











# Naxham Abbey

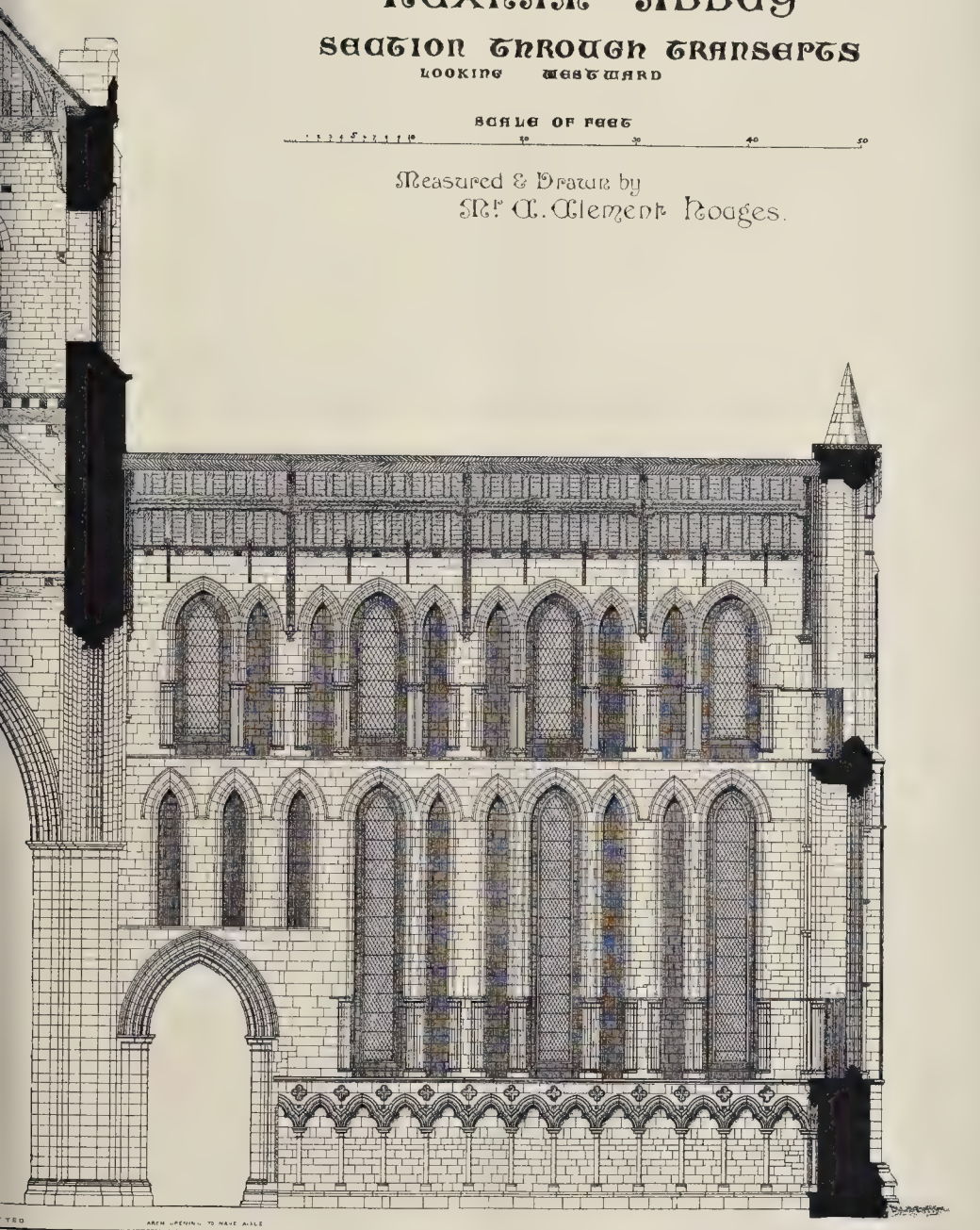
## SECTION THROUGH TRANSEPTS

LOOKING WESTWARD

SCALE OF FEET

10 20 30 40 50

Measured & Drawn by  
Mr. C. Clement Hooges.



1889

ARCH OPENING TO WEST WALL

PHOTO. BY KATAGLE & 22 MARKET LANE, LONDON, E.C. 4





architect, Munich, ably assisted by the painter, Herr Josef Widmann. Although traces of former outside painting were found, there was not enough to make a restoration possible, and, therefore, an independent and entirely original design was decided on, the artist being on a measure guided by the curious paintings in the well-known house at Schaffhausen, the date of which is 1570. The frieze at the base of the gable is about 4 ft. high, and represents, on the south side, the entry of Philip the Handsome of Burgundy, father of King Charles V. Within the gable are a clock and a sun-dial, a Medæval ship, and a figure of an angel between the windows, with the motto "Hic justitie et pietatis sedes," whilst all the windows are surrounded by fanciful decorations, intended to break the stiffness of the architectural lines. In the northern face the subject of the frieze is a public holiday, which permits the introduction of a number of inhabitants clad in the grotesque fashions of the sixteenth century. In the gable there is another clock, balanced by a Neptune (for the Lake of Constance), a knight with banner, and a column of Victory. The motto "Sol Deo gloria" over the middle window. The panels on the stairs and on the square projecting vestibule are left plain as yet, their ultimate decoration being for the present deferred. All the paintings were executed in water-colours on the dry plaster and protected by potash "waterglass."

#### HEXHAM ABBEY.

We give this week two further illustrations of Hexham Abbey, from the drawings of Mr. C. Hodges, the author of the fine monograph on Hexham Abbey, which was reviewed at some length in the *Builder* for December 29, 1888. The one shows the perspective view of the choir, with the seats and modern additions omitted. The other is the section through the transepts, looking west, showing the section of the interior slype, and the stair up to it against the west wall, and the fine treatment of the design of the west wall on the north side of the crossing, to which we referred in the review of a book.

#### PORCHES FOR PROPOSED HOUSES IN QUEEN'S-GATE, W.

THIS perspective is intended chiefly to illustrate a proposed arrangement of porches and terraces, for houses in Queen's-Gate. The illustration represents the original design which was prepared by the architect, but which will be modified in execution. The architect is Mr. Henry Taylor.

#### DESIGN FOR SINGLE-LIGHT WINDOW.

THE subject of this window is the "Assumption of the Virgin," treated in an original manner. The Virgin is draped in a blue mantle, and is surrounded, outside rays of glory, by a ring of angels, whose wings are arranged in place of a usual architectural canopy, and form a rich uper of varied rubies and low-toned greens; above are two angels holding a crown. The outer border is of a geometrical character, and beneath is an ornamental panel with an inscription in the centre. The design is by Mr. J. J. Wrathall, and was exhibited in the last Royal Academy Exhibition.

**The Institute of Builders.**—At a meeting of this Institute, held at its offices, 31 and 32, Abchurch-lane, Strand, on the 5th inst., Mr. Thomas F. Rider in the chair, Mr. Joseph Randall (of the firm of Kirk & Randall) read an important paper on "The Inclusion of Provisional Amounts in Contracts." We are enabled to hold over our report of it until next week.

**An Important Light and Air Case.**—The case of "The Attorney-General v. The Queen's Mansions (Limited)" came on for hearing, on the 2nd inst., before Mr. Justice Lindley. The Crown applied for an injunction against the defendant company restraining them from erecting a lofty block of buildings to the south of the Guards' Chapel in Birdcage-walk, James's Park. A large number of affidavits on both sides were read, and the case was adjourned. We will give a report of the case on the hearing has been concluded.

#### OSNEY BRIDGE, OXFORD.

THIS bridge, which crosses the main channel and one of the back-water streams of the river Thames, was recently opened for public traffic. The engineer of the work sends us the following account of it:—

The bridge is in substitution for a narrow stone bridge of five arches, which was undermined and partly carried away by the floods three years ago.

During the interval the road traffic had been accommodated by a temporary timber bridge, erected about 100 yards lower down the river.

Owing to the protracted negotiations between the parties interested, involving some legal proceedings, it was not until January last that the work of taking down the remains of the old bridge, preparatory to the erection of the present structure, was commenced.

The new bridge has one main opening of 60 ft., spanned by cast-iron arched girders, and there are two smaller stone arches over the back-water.

The cast-iron ribs are six in number, 18 in. deep at the crown, and increasing to 22 in. at the springing, the curvature increasing from an 80 ft. radius at the crown to a 40 ft. radius near the springing.

Each rib springs from a strong cast-iron bed-plate, and has a rise of 7 ft. The two outer ribs are ornamented by mouldings, and the spandrels are open. Each rib is in three segments, with planed joints, bolted together with heavy wrought-iron bolts. The cross bracing consists of six sets of light steel girders, with steel end-plates, and one set of diagonal bracing near each end.

The floor is Lindsay's patent flooring, consisting of steel spay channels, each rolled in one length to the full width of the bridge, and reversed on each other, rivetted together, and bolted down to the top flanges of the cast-iron ribs. The corrugations of the flooring are filled with cement concrete, which is brought to a uniform level two inches above the upper surface of the steel, and coated with half an inch of asphalt, to receive the road-metalling.

The parapet railings are of an ornamental geometrical pattern, each railing having in the centre a shield, bearing the arms of the Local Board on each face, and the end pillars are surmounted by cast-iron columns and lamps. The railings and lamps were manufactured by Messrs. Macfarlane & Co., of Glasgow.

The weight of cast-iron in the main span is about 69 tons, of wrought-iron 1½ tons, and of steel 20 tons, and the total dead-weight imposed upon the main abutments (including road-metalling and paving) is calculated at about 210 tons. The greatest live-weight which could be added would be about 100 tons.

The abutments and wall wings are built in coursed rubble work, the stone being mostly that taken from the old bridge; the main abutments are rock-faced, with tooled ashlar quoins and strings, and the parapets are in solid ashlar. The whole of the ashlar and the rock facing of the abutments is in Matlock stone. The wing walls and the end pillars are built to a curved batter.

The foundations are entirely encased in 6-in. sheet-piling driven through the gravel into the Oxford clay, and the pile-heads cut off several feet below the river-bed. The space within the piles was excavated to a depth of 3 ft. 3 in. below the pile-heads, and filled in with cement concrete. Great difficulties were met with in this portion of the work, owing to hard concretions in the gravel through which the piles were driven, and to heavy flooding with subsoil water from the course of one of the main sewers which siphons under the river close by the bridge. A delay of at least two months was due to these causes.

The overflow-weir adjoining the bridge was reconstructed, and three openings, 4 ft. 6 in. wide by 9 in. deep, were made in it, and provided with sluice-boards, for the better discharge of flood water from the main river.

The approaches, which were formerly very steep near the bridge, have been so modified as to give a uniform gradient of one in twenty-six up to the crown of the bridge. The clear width of the bridge, between the parapets, is 30 ft., divided into a 20-ft. carriage-way, and 5-ft. paths.

The engineer for the works was Mr. W. H. White, M.Inst.C.E., the contractors for the ironwork being the Horseley Company, Tipton, and for the abutments and remainder of the

works, Mr. W. J. McKenzie, of 5, Victoria-street, Westminster.

The total cost of the works, including the temporary bridge, was, approximately, £5000.

#### THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.

PRESENTATION TO SIR EDWIN CHADWICK, K.C.B.

THE sixth annual dinner of the Association of Public Sanitary Inspectors of Great Britain was held on Saturday evening last at the First Avenue Hotel, Holborn, advantage being taken of the occasion to celebrate the attainment of the 90th year of his age of Sir Edwin Chadwick, the President of the Association, who has within the last few days received the promotion to the Order of Knight Commander of the Bath from the Queen. Dr. Benjamin W. Richardson, F.R.S., occupied the chair, and was supported by the Earl of Aberdeen, Earl Fortescue, Sir Lyon Playfair, Sir Spencer Wells, Sir Richard Owen, the Hon. D. F. Fortescue, Dr. Buchanan, Sir Douglas Galton, Mr. Wyke Bayliss, Dr. Farquharson, M.P., Dr. Cameron, M.P., Mr. Hugh Alexander, Dr. A. Carpenter, Mr. B. Carter, and others. Letters expressing absence and cordially congratulating Sir Edwin Chadwick were read from the Duke of Westminster, the Earl of Meath, Mr. J. F. B. Firth, and other gentlemen.

The Chairman, in giving the loyal toasts, expressed the gratification they all felt at the honour conferred upon Sir Edwin Chadwick by the Queen, adding that they all revered him as the champion of health, the Cato, the wise man of England.

The Earl of Aberdeen, responding for the "House of Lords," also spoke of the pleasure he felt at being able to do honour to so worthy a man as their venerable guest. Sir Edwin Chadwick, he said, was the revered father of Poor Law reform and of sanitation, and was one of the original founders of what might be called the present system of Poor Law administration, owing, no doubt, to his membership of the great Commission on the condition of the sanitation of the labouring classes, in which he took the most energetic and conspicuous part.

The Chairman then, on behalf of the members of the Association, presented their guest with an illuminated address in commemoration of the attainment of the 90th year of his age, which read as follows:—

TO SIR EDWIN CHADWICK, K.C.B.

"We, whose names are appended to this simple but earnest Memorial, beg, on behalf of the members of the Association of Public Sanitary Inspectors of Great Britain, over whom you have so generously and ably presided since the foundation of the society in 1883, and of your many friends and fellow-workers in sanitary science at home and abroad, to tender to you our sincerest congratulations upon your entry into the ninetieth year of your life, and the seventieth of your active public career."

We should consider it an event historical in character for any one of our friends and contemporaries to have distinguished himself during so long a period in the promotion of any work of public utility; but, when we recall the labours which you have performed, and the objects of those labours, namely, the health of this nation and of other nations, and therewith the happiness, prosperity, and advancing civilisation of peoples everywhere, for all future generations,—our pleasure is the greater, not only that one so gifted as yourself should have laboured towards the accomplishment of such extensive and lasting goodness, but that we who have witnessed your efforts should have had the opportunity of testifying to the industry, courage, and enthusiasm, continued to the present hour, by which your efforts have been characterised, and which, from opponents as well as from friends and allies, have long commanded the respect and admiration which are ever accorded to those in whom genius for original observation and suggestion is combined with earnestness of purpose and consistency of action.

We consider that on your early labours in sanitation, especially your report on the sanitary condition of the labouring classes, and your introduction of the half-time system of education, the present advanced state of sanitation largely rests. And in thanking you for all you have done in the past for the health and happiness of mankind, we pray that your own health, hitherto so conspicuous an example of good sanitation, in its fullest strength and activity, may still long be preserved with every happiness that should to the last attend so honourable, honoured, and useful a life."

The address was signed by all the noblemen and gentlemen named, and by others to the number of ninety or a hundred in all.

Sir Edwin Chadwick, in his reply, mentioned that he probably owed the duration of his working ability to exceptional hereditary vitality, for his father had died at the age of eighty-four, his grandfather at 95, and his two great-grandfathers had lived to be centenarians. As to sanitary improvements, he said death-rates in towns under the separate system of drainage had been reduced by one-half through the work of the sanitary engineer







and rust, and dirt accumulation can have no effect upon the expelling power of the compressed air.

The danger which you supposed to be possible of the air-pressure filtering down imperceptibly is rendered extremely remote by the provision of a pressure-gauge, which should be placed in the entrance hall or some spot daily frequented by the heads of the establishment, so that the slightest leakage of air is at once seen. This gauge performs another important function: it shows that the tank is full of water, which can only be expelled by the expansion of the air and the consequent falling of the gauge. The system thus leads itself to the elimination of two serious dangers attending the usual roof and tower-tank methods, viz., an empty tank and a frozen tank, besides providing a fire-engine pressure.

As to cost, I may say that, within certain limits as regards the quantity of water stored, the expense is in most cases far less than, in some instances less than one-fourth,—that of placing tanks in water-towers or other elevated positions,—assuming, of course, equal quantities and equal pressures; so that the system greatly frees the hand of the architect when considering the question of water-towers and roof-tanks.

The official report of General Festing, R.E., to be found in the 1888 Blue-book, or "Report of the Department of Science and Art," will be found to confirm much of the above, and to give other information; and I may add that water-towers there spoken of as having been in contemplation would, if put up to contain only 2,000 gallons of water at 100 lb. pressure,—have cost four to six times as much as the high-pressure system, and could hardly have failed to present an appearance,—very much that of a factory chimney,—that would have justly aroused the indignation of the Builder.

M. VINNING,  
R.N. Retired List.

19, Great Winchester-street E.C.

\* \* We have referred to the passage in the report of the Science and Art Department in which the system as installed at South Kensington and Bethnal-green Museums is commented on; but we gather from it that the Department, like ourselves, regard it with a certain attitude of caution. They say, "The proper action is the regulating valve and the soundness of the air reservoir are, of course, the essentials of the system. The former was tested with satisfactory results in trials made before the apparatus was taken over. Time only can test the latter; so far there is no sign of any loss of pressure."

#### MR. RICKMAN'S PAPER ON SPECIFICATIONS.

SIR,—I hope that you will allow me to correct a slight error in your report!

What I really intended was, "It was not certain that the word 'supply' would always meet the case, and a builder might argue that he had not to fix."

And in the last paragraph, I meant to imply that the writing of a specification was not a pleasant job; that most architects preferred making drawings.—Yours, &c., HENRY LOVEGROVE.

### The Student's Column.

#### TOWN DRAINAGE.

##### X.—DRAINING THE GROUND.

**W**HATEVER difference of opinion at various times there may have been on some points of house drainage, it has always been considered desirable to drain away the water in the ground of the site of houses. There is an exception in the case of a running and, which, if an outlet for the great quantity of water it contains were suddenly made, might endanger the stability of buildings by the contraction of its bulk when relieved of its pressure of water; but in all ordinary cases of mere leakage of water out of the ground into a drain, it should be provided for, and an outlet made as to permanently lower the level at which the water has usually stood in the ground, when the level is nearer the surface than, say, 7 ft. or 8 ft., so that basement floors may be at all times kept dry, rather than adopt means to exclude the surrounding water; and even where there are no basement floors or cellars, it is desirable to lay dry the ground immediately beneath a house and around it. But the ground-water cannot be admitted to the drain at any of the joints, these being water-tight. Seeing the great importance of providing for the admission of ground-water into a drain, the joints were at one time left open in the upper part, being made water-tight only in the lower portion of each joint, up to the middle of the pipe. Ground-water does not run into a drain from above; it first sinks below the level of the rain, as far as the nature of the ground allows it to sink; and then, when an outlet is made for

it by laying a drain and leaving the upper part of the joints open, it rises occasionally to that level, but no higher, after the ground above it has been once dried.

But there has arisen, very properly, a system of testing drains after they are laid,—long after, sometimes,—in cases where complaints are made of leakage without knowing where it occurs. The drain is tested by filling it with water. Suppose that an intercepting-trap has been at some time placed in a house-drain, but that nothing more has been done, the trap having been considered to be all that was necessary, with, perhaps,—or perhaps not,—some attention to the ventilation at the other end of the drain. In this case, if a proper chamber has been constructed along with the trap, the examiner of the drain, acting under the general instructions of those who have complained, proceeds to stop up the end of the drain temporarily, going then to the back part of the house to another opening, or making one for the purpose, and pouring in water until it makes its appearance at the upper opening, which it will do if the joints are watertight all round the pipe. But if they have been made so only in the lower half, the upper half having been left open to dry the ground, the examiner cannot ascertain by this water-test whether that length of drain is good or not. He certainly may do so by a levelling operation, providing the fall in that length of drain be not more than half the diameter of the pipe; but this method could not be adopted in all cases.

If then the joints are made (as on this consideration they must be) completely watertight, so that they neither let out sewage below nor let in ground-water above the middle of their height, it becomes necessary to lay separate drains for drying the site of the house, and the junction of these with the main house-drain must be made on the upper side of the intercepting trap. This, in one respect, fixes the depth of the house-drain at that point. It must be deep enough there to receive the ground-water drain. The junction with the house-drain may be made at any point above the trap, but the air-inlet chamber is a convenient place, and the lower the point in the line of the main house-drain at which this junction is made, the better. Sewers are always laid deep enough for the drainage of the basement floors of houses. They are, therefore, deeper than is required for the outlet of a house-drain, which is laid for the drainage of the rain-water of the back premises and that of the sculleries and ground-floor offices, even though they be a long way from the street. It is, therefore, not necessary to lay the whole length of the house-drain as deep as it might be laid; but in order to get well under the level of the ground-water, the house-drain between the sewer and the intercepting trap should be laid for that distance as deep as the sewer-junction will allow, if that depth be not more than, say, 9 or 10 feet. From the intercepting trap upwards, the depth of the house-drain is governed by that of the lowest floor upon which water is used for any purpose, and if this be the ground-floor, the drain need not be more than 5 or 6 ft. deep on the upper side of the air-inlet adjoining the intercepting trap. We have, therefore, in some situations a brick shaft, the bottom of which may be 8 or 9 ft. below the surface, at which level the sewage leaves it, but enters it at a level several feet higher.

The addition to the sewage of even the comparatively small amount of water derived from the ground beneath and around houses is unwelcome at the outfall in cases where the sewage is pumped to any considerable height, or even in those cases where it flows away by gravitation, if the quantity of sewage be much increased thereby; but inasmuch as it contributes to the proper sanitary condition of the sites of houses, it should be effected even at some inconvenience in dealing with an increased quantity of sewage. The case is different to that of dealing with an excessive quantity of rain-water from the surface at uncertain times: the addition of ground-water to the sewage is a more regular addition, and although its quantity cannot be very closely calculated beforehand, a tolerably near approximation to it may be found on the basis of information to be obtained from well-sinkers, and otherwise, and from the area of those parts of a town which are situated upon ground from which water may be thus derived. Water following special courses through the ground, as it does in some situations, if met with by cutting through these courses in laying a drain or a sewer, must be dealt with

by special means, or excluded altogether, which, however, is a difficult thing to do when once interfered with; but none of these considerations should prevent the opportunity being taken of drying the sites of houses by means of the outlets afforded by the house-drains in ordinary cases. It does not follow from this that sewers should likewise be made to admit ground-water, inasmuch as they are laid at greater depths. It would be equally desirable, but it might involve an expense at the outfall which would be undesirable to such an extent as to make it prohibitory; but for house-drains the rule should apply in all cases, with the exceptions named only. Land-drain pipes without sockets are sufficient for the purpose, and the trench should be filled in over them with hard material, such as gravel, for the purpose of providing interstices through which the water may first find its way to the drain. The width of the trench is of no importance, and may be as narrow as will admit of the pipes being laid in, requiring, therefore, no great quantity of hard material, which sometimes has to be brought from a distance. If the bottom of the air-inlet shaft or chamber be laid deep enough for the admission of this ground-water drain, it can have no better outlet; the trap which prevents the air of the sewer passing up the drain also prevents it passing up the ground-water drain, and it therefore needs no other trap. If, however, the intercepting trap cannot for any reason be relied upon, then it is better to place a trap also at the end of the ground-water drain, for to admit foul air into it would be to contaminate all the air in the ground under and immediately around the house. When a trap is so placed in the ground-water drain there should be an air-inlet on its upper side, for which a 6-in. pipe is sufficient. When the main drain above the intercepting trap is laid deep enough for the drainage of a basement or cellar floor, it will also be deep enough at any part for the junction of the ground-water drain; but it should not enter the house-drain at the same level, for, if the quantity of ground-water be at all considerable, it would in that case interfere with the proper flow of the sewage. The bottom of the ground-water drain should be 3 in. higher than the bottom of the house-drain. For this reason the junction should be made at the air-inlet shaft or chamber, where the side wall offers every facility for admitting the branch at a higher level than that of the main drain.

#### Books.

*The Telephone.* By WILLIAM HENRY PREECE, F.R.S., and JULIUS MAIER, Ph.D. London: Whittaker & Co. 1889. Price 12s. 6d.

**I**N July, 1877, Mr. W. H. Preece brought the first pair of practical telephones to Europe. There are now 200,000 in daily use. In the short space of eleven years there has grown up all over the world not only a great but a highly specialised industry. Unlike the steam-engine, the railway, and the telegraph, the telephone sprang into full vigour and public use immediately on its invention; and if we in England make less use of it than is made in other countries, this is largely due to the "terrible monopoly," as Messrs. Preece & Maier call it, of the holders of the English patent rights. The problem to be solved was understood years before the telephone was invented. It was, in Sir William Thomson's words, to devise means "to realise the mathematical conception that, if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its currents must vary continuously, as nearly as may be, in simple proportion to the velocity of a particle of air engaged in constituting the sound." The problem appears to have been clearly in the mind of Mr. Charles Boursein, who in 1854 published a paper on the electric transmission of speech; but the first man to solve the problem in anything like a practical way was Philipp Reis, of Friedrichsdorf, in 1860. Reis's telephone was intended in the first instance to convey only musical sounds; but Messrs. Preece and Maier are of opinion that it "certainly did transmit speech." On this point there has been much controversy. However this may be, certain it is that for the next sixteen years nothing was done in connexion with the speaking telephone, though many improvements were made on the musical telephone by many inventors. At the beginning



## Miscellaneous.

**The Construction of Roads.**—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. Jonathan R. Baillie, President, in the chair, a paper was read on "The Construction and Repair of Roads," by Mr. George R. Strachan, Assoc. M. Inst. C.E., of Chelsea. The author said that the true principle of road construction was to make the foundation the real road, and the material thereon a wearing surface only. Its use secured economy in construction and maintenance. Roads should be made to suit the vehicles using them, and not the vehicles to suit the road. A concrete foundation 6 in. thick would carry 600 tons per yard per day without deterioration. It should be constructed carefully, accurately, and scientifically, for it was the actual road. Asphalt, as a wearing surface, was the best in use to-day, as it possessed the advantages of durability, cleanliness, economy, and healthiness, which outweighed its slipperiness. When laid 2½ in. thick it gives a life of fifteen years in Cheapside, at a cost of 13s. per square yard. The first cost of such a road 36 ft. wide equalled 12,783l. per mile, and the average annual cost for repairs equalled 528l. per mile. The asphalt could be renewed at half the original cost, and a life of fifteen years was again before it. Wood was a useful wearing surface. Swedish yellow deal had given ten years of life under a traffic of 600 tons per yard per day, and the wear had not exceeded 3 in. The cost was 9s. 6d. per square yard, not taking credit for old material, and the annual cost of repairs 3d. per square yard. The first cost of such a road 36 ft. wide equalled 9,322l. per mile, and the annual average cost for repairs equalled 264l. per mile. Soft woods were preferable to hard woods. The cressotting of blocks added to their life, and was advisable for severe traffic. Wood was not suitable for light traffic. Stone pavements were practically prohibited by the noise they made. A 3 in. by 7 in. Guernsey granite paved road on concrete cost 15s. per square yard, and gave fifteen years' life. The first cost of such a road 36 ft. wide would be 15,840l. a mile, and the annual repairs 89l. per mile.

**The English Iron Trade.**—The English iron market continues buoyant, the steady rise in pig-iron and a well-sustained demand for finished products also sending up the prices of manufactured iron and steel. The favourable nature of the Cleveland ironmasters' returns for February, and the activity of the home demand, have led to a second rise of 9d. a ton (making from 1s. 6d. to 2s. in the fortnight) in No. 3 G.M.B., which is now quoted 36s. 9d., and may even, it is said, before long go up to 40s. The Glasgow warrant market has again been strong this week, and is still in a rising tendency. Scotch pig-iron makers have also raised their quotations, the advances ranging from 6d. to 1s. a ton. Lancashire producers of crude iron are 1s. higher in their prices; while Lincolnshire, Derbyshire, and Staffordshire makers are also quoting advanced figures. Bessemer iron in the north-west is 6d. better in price. The higher rates that have to be paid for pig-iron have caused manufacturers of finished iron in the North of England to quote their products 2s. 6d. a ton higher; Scotch makers have put up marked bars 5s.; while in the other districts manufacturers are very firm, and will probably soon follow the lead of the Cleveland and Scotch ironmasters. There being an improvement in the demands for tinplates, quotations are firmer than they have been recently. Enhanced prices are current for steel, rails being quoted up to £4. 7s. 6d. and £4. 10s., and advances have been declared in shipbuilding steel. Some further orders for new ships have been fixed during the week, and others are in the market, but builders are not very ready to take fresh work on account of the uncertainty as to the prices of shipbuilding material. Engineers continue to be very fully booked with orders.—*Iron.*

**The Competition for the new Parliamentary Buildings in Stockholm.**—The competition for the new Parliamentary buildings, to be erected in Stockholm promises to be a keen one, no fewer than one hundred architects having entered for it.

**Ancient Sculpture in Bronze.**—We are again obliged to hold over the reports of Mr. A. S. Murray's lectures on this subject at the Royal Academy.

**Technical Education: The Blacksmiths' Company.**—The great interest felt in promoting what is universally admitted to be a necessity of the times, viz., "Technical Education," has caused several of the City Companies to initiate and hold from time to time exhibitions of work of the craft with which they are associated. The blacksmiths' craft is admittedly a very useful branch of the manufacturing industry of the country, and has in recent years once again taken up ornamental work, embracing panel-work for building decoration, as well as articles for house and table decoration. The fact that a large quantity of such work is being imported into this country is an evidence that there is a market for it, and has caused the Blacksmiths' Company (one of the oldest of the City guilds) to determine to hold an exhibition of the description of work alluded to, and to offer inducements, by way of money prizes, certificates of merit, medals, and in certain cases the honorary freedom of the Company, to journeymen and apprentices of the trade to send in articles for competition. The Company purpose holding, towards the end of March, an exhibition of the work sent in. The Court of the Ironmongers' Company having been approached, have kindly determined to grant the use of their hall for the purposes of the exhibition. The Company having come forward to initiate the good work, the journeymen and apprentices connected with the trade must evidence to the world that they are both ready and willing to do all in their power to make the exhibition in which they, at any rate, have so great an interest, in every way a success. The Clerk to the Company, Mr. William B. Garrett, of 16, Water-lane, Great Tower-street, will be glad to furnish every information required by persons proposing to exhibit or taking an interest in the good work in hand.—*City Press.*

**Birmingham Architectural Association.** At the meeting of this Association held on Tuesday evening last, a paper on "The Modern Architecture of Vienna," by Mr. T. Blashill, Superintendent Architect of the Metropolitan Board of Works, was read in his unavailing absence by Mr. H. R. Lloyd (hon. sec.). Mr. Blashill said that the climate was characterised by brightness, and that in the centre of the city houses of some architectural pretension were inhabited in flats by the middle classes and artisans, the latter being closely packed, and both paying much more for less accommodation than their equals in London; and he passed on to describe some of the chief buildings in Vienna, among them the Hof Theatre, designed by Baron von Hasenauer, sumptuous in design and decoration; Ferstel's University and Votive Church, the latter one of the rare examples of modern Gothic; the Palace of Justice and the Town Hall designed by Baron von Schmidt; the two Imperial Museums, and the new Palace now being built for the Emperor, and the only instance known to Mr. Blashill of a successful use of a pure Greek style in a complicated building. Mr. Blashill said that a marked feature of Viennese buildings is the free use of sculpture, and that many very successful buildings are built of brick and stucco, and concluded his paper by remarking upon the grand combination of tact, talent, and business capacity which had produced the improvements in the city, and made it so well worthy of study. The paper was illustrated by a large collection of fine photographs.

**A New Window at Edinburgh.**—The Jubilee year has been commemorated by the Society of Writers to the Signet in Edinburgh by the filling-in of the west window of their hall in Parliament-square with stained glass. The window is square-headed, about 20 ft. in height, and is divided into three lights, a wide central one, and two narrow ones separated by heavy mullions. In the middle of the central compartment appears the Royal Arms of Scotland, having the sword and sceptre crossed behind it and the crown above. Over the Royal Arms appears that of the Society, and in the lower section are placed the arms of the Earl of Glasgow, the present Keeper of the Signet, and of the late Mr. John Clerk Brodie, who was his deputy. In the side-lights appear the arms of former Keepers and Deputy-keepers of the Signet. The borders of the three lights and the devices in general are Renaissance in style, and the details are rich and brilliant in colour, harmonised by a silvery background. On a scroll at the foot is recorded the occasion of the erection of the window, which has been executed by Messrs. Ballantyne & Sons.

**The Seville Cathedral.**—Some months ago, it may be remembered, part of the roof of the chancel in the Seville Cathedral fell in, owing to two pillars supporting it giving way. However, by dint of considerable exertion, and at great cost, with no small danger to the workmen, any further falling in of this venerable edifice was believed to have been averted; but this appears, according to Madrid journals, not to be the case, the work of restoration having some days ago to be suspended owing to a third pier and a further portion of the roof threatening to collapse, and the architect directing the work, Señor Casanova, has declared that if the building is to be saved at all it will be necessary to support it by shoring all round and re-erecting the piers from the base. However, as the money required for this work will hardly be forthcoming, the Madrid press appears to consider the old Andalusian cathedral doomed.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                     |           | £. | s. | d. | £. | s. | d. |
|---------------------------------------------|-----------|----|----|----|----|----|----|
| Teak, E.I.                                  | load      | 9  | 0  | 0  | 14 | 0  | 0  |
| Sequoia, U.S.                               | foot cube | 0  | 8  | 0  | 0  | 0  | 0  |
| Ash, Canada, 1st                            | load      | 3  | 10 | 0  | 5  | 0  | 0  |
| Birch                                       | load      | 3  | 10 | 0  | 8  | 0  | 0  |
| Elm                                         | load      | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantisc                                | load      | 2  | 10 | 0  | 4  | 0  | 0  |
| Oak                                         | load      | 2  | 10 | 0  | 4  | 0  | 0  |
| Canada                                      | load      | 5  | 10 | 0  | 7  | 10 | 0  |
| Pine, Canada red                            | load      | 3  | 5  | 0  | 4  | 0  | 0  |
| St. Petersburg                              | load      | 3  | 10 | 0  | 5  | 10 | 0  |
| Lath, Dantisc                               | fathom    | 4  | 10 | 0  | 6  | 10 | 0  |
| St. Petersburg                              | load      | 5  | 0  | 0  | 6  | 10 | 0  |
| Wainscot, Riga, &c.                         | log       | 2  | 15 | 0  | 0  | 0  | 0  |
| Osage, grown                                | load      | 2  | 15 | 0  | 3  | 5  | 0  |
| Deal, Finland, 2nd and 1st, std. 100        | load      | 9  | 10 | 0  | 10 | 10 | 0  |
| " 4th and 3rd                               | load      | 7  | 10 | 0  | 8  | 0  | 0  |
| St. Petersburg, 1st yellow                  | load      | 11 | 10 | 0  | 15 | 0  | 0  |
| " 2nd                                       | load      | 9  | 10 | 0  | 11 | 0  | 0  |
| " white                                     | load      | 8  | 10 | 0  | 10 | 10 | 0  |
| Swedish                                     | load      | 8  | 10 | 0  | 16 | 0  | 0  |
| White Sea                                   | load      | 9  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                           | load      | 10 | 0  | 0  | 26 | 10 | 0  |
| " 2nd                                       | load      | 11 | 0  | 0  | 17 | 10 | 0  |
| " 3rd                                       | load      | 8  | 0  | 0  | 10 | 10 | 0  |
| Spruce, 1st                                 | load      | 9  | 10 | 0  | 10 | 10 | 0  |
| " 3rd and 2nd                               | load      | 7  | 0  | 0  | 8  | 10 | 0  |
| New Brunswick, &c.                          | load      | 6  | 10 | 0  | 20 | 0  | 0  |
| Battens, all kinds                          | load      | 6  | 10 | 0  | 20 | 0  | 0  |
| Flooring Boards, sq., 1 in. prepared, First | load      | 0  | 11 | 0  | 0  | 14 | 0  |
| " Second                                    | load      | 0  | 8  | 0  | 0  | 11 | 0  |
| " Other qualities                           | load      | 0  | 5  | 0  | 0  | 7  | 10 |
| Cedar, Cuba                                 | foot      | 0  | 0  | 44 | 0  | 0  | 0  |
| Honduras, &c.                               | load      | 0  | 0  | 4  | 0  | 0  | 0  |
| Mabogany, Cuba                              | load      | 0  | 0  | 44 | 0  | 0  | 0  |
| St. Domingo, cargo average                  | load      | 0  | 0  | 44 | 0  | 0  | 0  |
| Mexican                                     | load      | 0  | 0  | 44 | 0  | 0  | 0  |
| Tobacco                                     | load      | 0  | 0  | 44 | 0  | 0  | 0  |
| Honduras                                    | load      | 0  | 0  | 5  | 0  | 0  | 0  |
| Box, Turkey                                 | ton       | 4  | 0  | 0  | 12 | 0  | 0  |
| Rose, Rio                                   | ton       | 12 | 0  | 0  | 19 | 0  | 0  |
| Bahia                                       | ton       | 12 | 0  | 0  | 18 | 0  | 0  |
| Satin St. Domingo                           | ton       | 0  | 0  | 6  | 0  | 1  | 0  |
| Porto Rico                                  | ton       | 0  | 0  | 9  | 0  | 1  | 0  |
| Walnut, Italian                             | ton       | 0  | 0  | 44 | 0  | 0  | 0  |

## METALS.

|                            | £. | s. | d. | £. | s. | d. |
|----------------------------|----|----|----|----|----|----|
| Iron—Bar, Welsh, in London | 5  | 5  | 0  | 5  | 10 | 0  |
| " " at works in Wales      | 4  | 15 | 0  | 5  | 0  | 0  |
| " " at works in London     | 5  | 10 | 0  | 5  | 10 | 0  |
| Copper                     |    |    |    |    |    |    |
| British, cake and ingot    | 70 | 0  | 0  | 72 | 0  | 0  |
| Best selected              | 71 | 0  | 0  | 72 | 0  | 0  |
| Australian                 | 69 | 0  | 0  | 70 | 0  | 0  |
| Chili, bars                | 69 | 0  | 0  | 70 | 0  | 0  |
| Yellow Metal               | 0  | 0  | 84 | 0  | 0  | 0  |
| Lead—Pig, Spanish          | 12 | 17 | 6  | 0  | 0  | 0  |
| English, common brands     | 13 | 2  | 0  | 0  | 0  | 0  |
| Sheet, English             | 14 | 0  | 0  | 14 | 5  | 0  |
| Sprayer                    |    |    |    |    |    |    |
| Silesian, special          | 17 | 12 | 6  | 17 | 16 | 0  |
| Ordinary brands            | 17 | 10 | 0  | 17 | 12 | 0  |
| Tin                        |    |    |    |    |    |    |
| Banco                      | 98 | 0  | 0  | 0  | 0  | 0  |
| Billiton                   | 97 | 0  | 0  | 0  | 0  | 0  |
| Strait                     | 95 | 10 | 0  | 0  | 0  | 0  |
| Australian                 | 95 | 10 | 0  | 0  | 0  | 0  |
| English ingots             | 98 | 10 | 0  | 0  | 0  | 0  |
| Zinc—English sheet         | 21 | 0  | 0  | 22 | 0  | 0  |

## OILS.

|                        | £. | s. | d. | £. | s. | d. |
|------------------------|----|----|----|----|----|----|
| Linseed                | 19 | 7  | 6  | 18 | 12 | 0  |
| Cocunut, Cochila       | 26 | 5  | 0  | 0  | 0  | 0  |
| Ceylon                 | 26 | 5  | 0  | 0  | 0  | 0  |
| Palm, Lagos            | 25 | 0  | 0  | 0  | 0  | 0  |
| Rapeseed, English pale | 27 | 10 | 0  | 0  | 0  | 0  |
| " brown                | 23 | 10 | 0  | 0  | 0  | 0  |
| Cottonseed, refined    | 23 | 10 | 0  | 0  | 0  | 0  |
| Tallow and Oleine      | 19 | 0  | 0  | 46 | 0  | 0  |
| Lubricating, U.S.      | 6  | 0  | 0  | 0  | 0  | 0  |
| Chili, refined         | 7  | 0  | 0  | 12 | 0  | 0  |
| Tab—Stockholm          | 1  | 2  | 0  | 1  | 2  | 0  |
| Archangel              | 0  | 14 | 0  | 0  | 14 | 0  |

## TENDERS.

[Communications for insertion under this heading reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                     |      |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------|------|---|---|
| ABBOTT'S LANGLEY (Herts).—For alterations to Abbott's House, for Mr. Joshua Walker. Mr. C. P. Ayres, architect, Watford, architect. | £565 | 0 | 0 |
| Dove, Watford.                                                                                                                      | 610  | 0 | 0 |
| T. Turner (Limited), Watford.                                                                                                       | 610  | 0 | 0 |
| Waterman, Watford.                                                                                                                  | 424  | 0 | 0 |



CONTRACTS AND PUBLIC APPOINTMENT.  
Epitome of Advertisements in this Number.

CONTRACTS.

| Nature of Works, or Materials.      | By whom Required.        | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------|--------------------------|-----------------------------------|--------------------------|-------|
| Works and Materials                 | St. Giles' Bd. of Wks.   | Official                          | Mar. 11th                | xi.   |
| Do.                                 | do.                      | do.                               | do.                      | xi.   |
| Supply of Red Deal and Batten Ends. | City of London Union     | do.                               | do.                      | xi.   |
| Cast Iron Pipes                     | Manchester Corporation   | G. H. Hill                        | do.                      | xi.   |
| Construction of Aqueduct            | do.                      | do.                               | Mar. 12th                | ii.   |
| Police Court at Dalston             | Comrs. of H.M. Works     | Official                          | Mar. 13th                | ii.   |
| Addition to Bishop Auckland Station | North Eastern Railway    | W. Bell                           | do.                      | ii.   |
| Cleaning and Painting Stations, &c. | Midland Waterworks       | A. A. Langley                     | Mar. 14th                | ii.   |
| Works and Repairs to Buildings      | Comrs. of H.M. Works     | Official                          | do.                      | ii.   |
| English Rag Stone Paving            | Southend Local Board     | P. Dodd                           | Mar. 19th                | xiii. |
| Leobane, Larpens, &c.               | Lewisham Bd. of Wks      | Official                          | do.                      | xi.   |
| Annual Contracts                    | do.                      | do.                               | do.                      | xi.   |
| Draining Works                      | Brentford Local Board    | do.                               | do.                      | xi.   |
| Draining Works                      | Hanwell Local Board      | E. J. W. Herbert                  | Mar. 20th                | xiii. |
| Military Sludge Lifting Power, &c.  | Dorking Local Board      | G. S. Matthews                    | do.                      | xiii. |
| Waterworks                          | Lickfield Waterworks Co. | H. B. Nichols                     | do.                      | xi.   |
| Main Outfall Sewer                  | Yatradysford, &c.        | do.                               | do.                      | xi.   |
| Settling Tanks                      | Main Sewage Board.       | Chatterton & Basalgette           | Mar. 21st                | xi.   |
| Draining Works                      | Mortlake Highway Bd.     | Official                          | Mar. 26th                | xii.  |
| Draining Works                      | do.                      | J. Medworth                       | do.                      | xiii. |
| Draining Works                      | Bideford U.S.A.          | Official                          | Mar. 27th                | xi.   |
| Draining Works                      | War Department           | Official                          | April 1st                | xiii. |
| Draining Works                      | Libson Municipality      | do.                               | Not stated.              | xiii. |
| Draining Works                      | Updon - upon - Severn    | E. Day                            | do.                      | ii.   |

PUBLIC APPOINTMENT.

| Nature of Appointment. | By whom Advertised.   | Salary. | Applications to be in. | Page. |
|------------------------|-----------------------|---------|------------------------|-------|
| Surveyor and Engineer  | Brentford Local Board | 200l.   | Mar. 19th              | xix.  |

BALHAM.—For the erection of two shops in the Caven-  
shod, for Mr. Isaac Haskins. Mr. A. M. Leach,  
architect and surveyor, Rosseter-road, Balham:—  
Hoare & Son ..... £1,300 0 0  
Galsfield ..... 1,175 0 0  
Cortis ..... 1,125 0 0  
Lang ..... 1,056 0 0  
Beare ..... 1,635 0 0

CHARLTON (Kent).—For the pulling down and re-  
building of "The Old White Swan" Inn, at Old Charlton,  
Kent. Mr. John Rowland, architect and Surveyor, Old  
Charlton, Kent. Quantities by W. Farthing, 45, Strand,  
W.C.  
Hobbs & Potheringham ..... 3,750 0 0  
Henry Burnan & Son ..... 3,239 0 0  
Kirk & Randall ..... 3,200 0 0  
H. L. Holloway ..... 3,120 0 0  
S. J. Gerrard ..... 3,046 0 0  
Henry Coombe ..... 3,000 0 0  
Holloway Bros. .... 2,933 0 0  
Balaam Bros., Shenton Street, Old  
Kent road ..... 2,930 0 0

CHELMSFORD.—For the erection of a pair of cottages  
in the "Fairfield," for Mr. S. J. Baker. Mr. T. White-  
more, architect:—  
A. Roper, Chelmsford ..... £394 0 0  
H. Kennell, Writtle ..... 339 0 0  
J. Lumsden, Chelmsford ..... 317 0 0  
H. Potter, Chelmsford (accepted) ..... 263 0 0

CHELMSFORD.—For the erection of the "Essex  
Antechamber," comprising warehouses, stables, &c., for  
Messrs. W. & A. R. T. Wintour, architect:—  
Mrs. Moss (accepted) ..... £200 0 0

COVENTRY.—For the erection of Bablake Boys'  
school, for the Trustees. Messrs. John Giles, Gough, &  
Rolfe, architects. Quantities by Mr. C. H. Goode:—  
T. Belham & Co., 155, Buckingham  
Palace-road ..... £14,390 0 0  
Thos. Turner (Limited), Watford  
Road ..... 14,183 0 0  
D. Ellwood & Son, Sandy, Beds ..... 13,900 0 0  
Stephens & Bastow, Wadsworth-  
road ..... 13,999 0 0  
Thos. Page, Banbury ..... 13,140 0 0  
John Thomas, Peterborough ..... 13,076 0 0  
Foster & Dicksee, Rugby ..... 12,833 0 0  
John Worwood, Coventry ..... 12,620 0 0  
C. Haywood, Junr., Coventry ..... 12,600 0 0  
G. Gray Hill, Coventry ..... 12,477 0 0  
Geo. F. Smith & Sons, Milverton  
Leamington ..... 12,387 0 0  
Parnell & Son, Rugby ..... 12,379 0 0  
John Inwood, Malvern ..... 12,335 0 0  
John Shillito & Son, Bury St.  
Edmunds ..... 12,294 0 0  
Edmund Gabbott, Liverpool ..... 12,187 0 0  
John Fell, Leamington ..... 12,175 0 0  
W. Bisset & Sons, Birmingham ..... 12,137 0 0  
H. Wilcock, Wolverhampton ..... 11,885 0 0  
Bradley & Co., Wolverhampton ..... 11,725 0 0  
Thomas Lewis & Sons, Burton-on-  
Trent ..... 11,700 0 0  
Claridge & Bloxham, Banbury ..... 11,450 0 0

EXTOWN (Somerset).—For building hunting-lodge,  
down Somerset, for Mr. P. Evered. Mr. W. King Lucas,  
architect, Rolls-chambers, Chancery-lane:—  
Willis & Son, Bridgewater (accepted), £1,560 0 0

HARROW.—For alterations to "The Ballot Box"  
Public-house, Horsenden Hill, for Messrs. Benskin & Co.,  
Barnes Brewery, Watford. Mr. C. F. Ayres, 52, High-  
road, Watford, architect:—  
Waterman, Watford ..... £964 0 0  
Beechener, Harrow ..... 863 13 6  
T. Turner (Limited), Watford ..... 862 15 0

HAMPSTEAD, N.W.—For additions and alterations to  
the "King William IV" Tavern, High-street Hampstead,  
for Mr. W. A. Treadaway. Mr. Albert E. Peimore,  
architect, 2, Broad-street-buildings, E.C.:—  
Kilby & Gayford ..... £486 0 0  
Gould & Broad ..... 430 0 0  
E. A. Hudson ..... 409 10 0  
W. Evans ..... 377 0 0  
Thos. Taylor ..... 364 0 0  
J. Crane ..... 364 0 0

KINGSBRIDGE (Devon).—For the erection of parish-  
room and school, for the Right Hon. Earl Compton, at  
Charlton, near Kingsbridge. Mr. Fredk. J. Connin,  
architect, Exeter. Quantities supplied:—  
Gibson, Exeter ..... £1,422 0 0  
Vaastone, Paignton ..... 1,248 0 0  
Coles, Exeter ..... 1,230 0 0  
Stephens & Son, Exeter ..... 1,180 0 0  
Edgcombe & Harty, Kingskaton ..... 1,158 0 0  
Tevens, Plymouth ..... 1,139 0 0  
Ruth & Son, Kingsbridge ..... 985 0 0  
Pearce, Kingsbridge ..... 940 0 0  
Crocker, Mowbray ..... 918 19 6  
Rowe, Plymouth ..... 902 0 0  
Rundle, Kingsbridge ..... 889 7 0  
Blake, Charlton ..... 886 0 0  
Fair & Son, Kingsbridge ..... 885 0 0  
Tucker & Hutchings, Kingsbridge\* ..... 841 2 9  
\* Accepted.

LLANELLY.—For the erection of new printing-offices,  
for the Llanelly and County Guardian newspaper. Mr.  
Thomas Arnold, architect, Llanelly:—

Masonry.  
D. Hopkins, Llanelly ..... £1,065 0 0  
G. Davies, Llanelly ..... 876 11 0  
D. Williams, Llanelly ..... 789 12 4  
D. Hughes, Llanelly ..... 789 5 0  
Davies & Hopkins, Llanelly ..... 718 18 6  
Wm. Bassett, Llanelly\* ..... 715 0 0  
Carpentry.  
D. Edwards, Llanelly ..... 488 0 0  
B. Howell & Son, Llanelly ..... 486 18 9  
Brown, Thomas & John, Llanelly\* ..... 364 0 0  
\* Accepted.

LLANELLY.—For the erection of five cottages at  
Andrew-street. Mr. Thomas Arnold, architect, Llanelly.

Masonry.  
D. Williams, ..... £375 0 0  
D. Hopkins ..... 432 0 0  
D. Hughes ..... 432 0 0  
Davies & Hopkins (accepted) ..... 425 0 0  
James Lewis ..... 410 0 0  
G. Davies ..... 406 0 0  
W. Bassett ..... 385 0 0  
J. Edwards, Pembrey\* ..... 375 0 0  
\* The rest are of Llanelly.  
Carpentry.  
T. & J. Brown ..... £238 0 0  
D. Edwards ..... 238 0 0  
John Thomas ..... 236 0 0  
J. Banks, Dafen ..... 231 0 0  
J. Evans (accepted) ..... 230 0 0  
The rest are of Llanelly.

LONDON.—For the erection of new Middle School for  
Girls, at Stamford Hill, for the Worshipful Company of  
Skinners. Mr. Edward H. Burnell, architect, 32, Bed-  
ford-row. Quantities by Mr. W. R. Mallett, 35, Great  
St. Helen's, E.C.:—  
Ashby & Horner ..... £11,100 0 0  
J. & J. Greenwood ..... 11,060 0 0  
Hall, Beddall, & Co. .... 10,645 0 0  
Scriveners & Co. .... 10,674 0 0  
Futman & Fotheringham ..... 9,473 0 0  
Dabbs ..... 8,765 0 0  
Godfrey & Son ..... 8,747 0 0  
Holloway Brothers ..... 8,984 0 0

LONDON.—For erecting head-quarters and drill-hall in  
Leonard-street, City-road, for 2nd Middlesex Artillery  
Barracks Co. Limited. Mr. Chas. J. Higgins, architect.  
Quantities by Mr. A. J. Beasley:—  
G. H. & A. Bywaters ..... £5,483 0 0  
Thos. Heath ..... 5,398 0 0  
Colls & Sons ..... 5,285 0 0  
Puzos & Lumley ..... 5,225 0 0  
J. Grover & Son ..... 5,200 0 0  
J. Murter ..... 5,187 0 0  
Clarke & Bracey ..... 5,143 0 0  
Holliday & Greenwood ..... 5,141 0 0  
Outhwaite & Son ..... 4,969 0 0  
S. E. Lambie ..... 4,853 0 0  
W. L. Kellaway ..... 4,840 0 0  
Futman & Fotheringham ..... 4,773 0 0  
A. White & Co. .... 4,763 0 0  
Mans Gentry (accepted) ..... 4,760 0 0  
[Architect's approximate estimate, £4,700.]

LONDON.—For rebuilding the Hall of the Worshipful  
Company of Brokers, for Messrs. Morley & Gray, No.  
36, Gutter-lane, Chancery-lane, E.C. Mr. Herbert Huntly  
Gordon, architect and surveyor, 28, Craven-street,  
Chancery-cross, W.C.:—  
Hall, Beddall, & Co. .... £4,973 0 0  
H. I. Beddall & Co. .... 4,941 0 0  
Hobbs & Co. .... 4,926 0 0  
Colls & Sons ..... 4,884 0 0  
Holliday & Greenwood ..... 4,881 0 0  
Feto Brothers ..... 4,780 0 0  
Ashby & Horner ..... 4,697 0 0  
Morter ..... 4,625 0 0  
Brass & Son ..... 4,573 0 0  
Wm. Sheppard ..... 4,485 0 0  
D. Charteris (accepted) ..... 4,478 0 0  
Excavation and Foundations.  
Hall, Beddall, & Co. .... £440 0 0  
F. & H. Higgs ..... 400 0 0  
Feto Brothers ..... 395 0 0  
Holliday & Greenwood ..... 389 0 0  
Wm. Sheppard ..... 388 0 0  
D. Charteris (accepted) ..... 382 0 0

LONDON.—For rebuilding two warehouses, Nos. 77,  
78, 79, and 80, Paul-street, Finsbury, E.C., for Mr.  
Thomas Griffin. Mr. John Groom, architect, 1, Broad-  
street-buildings, E.C.:—  
Woodward ..... £3,160 0 0  
J. Kent ..... 3,179 0 0  
Matecock ..... 3,173 0 0  
Grover ..... 3,097 0 0  
Holloway ..... 3,087 0 0  
Lawrence ..... 3,087 0 0  
Kilby & Gayford ..... 3,074 0 0  
Stimpson ..... 3,066 0 0

LONDON.—For alterations and additions to No. 17, 19,  
and 21, Bucknell-street, Oxford-street, W., for Mr. E.  
H. Brown. Messrs. Glazier & Sons, architect, 6, Spring-  
garden, S.W. Quantities supplied:—  
Rider & Son ..... £1,778 0 0  
Alden & Pater ..... 1,718 0 0  
C. W. Boris & Co. .... 1,617 0 0  
B. E. Nightingale ..... 1,357 0 0

LONDON.—For alterations at No. 22, Cross-street,  
Islington, and covering-in back garden:—  
G. Stuart ..... £1,068 0 0  
Gould & Brand ..... 945 0 0  
Hunt ..... 943 0 0  
McCormick & Sons, 34, Canonbury-  
road, N. (accepted) ..... 865 0 0

LONDON.—For erecting private residence in Daleham-  
garden, Hampstead:—  
Allison & Foskett ..... £2,495 0 0  
McCormick & Sons, 34, Canonbury-  
road, N. (accepted subject to alterations) ..... 2,435 0 0

LONDON.—For alterations, &c., to Nos. 6 and 7, Nor-  
ton Folgate, E.C. Mr. J. Hamilton, architect:—  
Balaam ..... £441 0 0  
W. Shurman ..... 315 0 0  
J. W. Beale ..... 297 0 0  
S. Hayworth ..... 279 0 0

LONDON.—For the erection of a workshop in Sarah  
Anne-street, Waltham, S.E., for Messrs. Green & Walker.  
Mr. F. A. Powell, architect. Quantities supplied:—  
W. Smith ..... £1,199 0 0  
Gregory ..... 1,168 0 0  
Burman & Son ..... 1,149 0 0  
Castle ..... 1,140 0 0  
Downs ..... 1,069 0 0  
J. O. Richardson ..... 1,037 0 0  
W. & F. Crocker ..... 1,024 0 0

LONDON.—For proposed restoration after fire of No.  
393, Strand, for the trustees of Hickson's Estate. Mr.  
F. R. Ashby, architect, 181, Queen Victoria-street,  
E.C.:—  
Higgs & Hill ..... £925 0 0  
Ellis & Co. .... 885 0 0  
Toms ..... 845 0 0  
Stimpson ..... 798 0 0  
Kilby & Gayford ..... 783 0 0  
Adamson ..... 779 0 0

LONDON.—For alterations and additions to No. 7,  
St. George's-road, Regent's-park, N.W. Mr. Alfred  
Corder, architect, Palace-chambers, Westminster. Quan-  
tities by Mr. Theodore Thorn, 63, Finsbury-pavement,  
E.C.:—  
G. S. S. Williams & Son ..... £3,030 0 0  
W. Scriveners & Co. .... 2,985 0 0  
J. & J. Greenwood ..... 2,899 0 0  
E. Lawrence & Sons ..... 2,819 0 0  
W. Goodman ..... 2,777 0 0  
Edmund Toms (accepted) ..... 2,676 0 0

LONDON.—For the erection of four shops and dwellings  
over in Mint-street, Southwark, for Mr. Walter Bennett.  
Messrs. Byrne & Stoolbridge, architects, 168, Strand, W.C.  
Quantities supplied:—  
T. Boyce ..... £2,121 ..... 83  
Holliday & Greenwood ..... 2,083 ..... 85  
Turtle & Appleton ..... 2,075 ..... 90  
J. Walker ..... 2,068 ..... 98  
J. Anley ..... 1,990 ..... 77  
Harris & Wardrop ..... 1,943 ..... 83

LONDON.—For warming the school in Horseferry-road, Westminster, on the low-pressure hot-water system, for the School Board for London. Mr. T. J. Bailey, architect.—

|                                |           |
|--------------------------------|-----------|
| T. R. Kershaw                  | 2489 15 0 |
| J. W. Smith, Gray & Co.        | 434 0 0   |
| C. P. Kinnell & Co.            | 442 10 0  |
| Mugger & Co.                   | 440 0 0   |
| J. G. Wagstaff                 | 408 0 0   |
| G. Haden & Son                 | 363 10 0  |
| J. Grundy                      | 389 0 0   |
| Eagle Iron and Engineering Co. | 350 9 8   |
| Turner & Co.                   | 334 0 0   |
| W. G. Cannon                   | 335 0 0   |
| Hayward, Bros. & Eckstein      | 325 0 0   |
| Young & Bass                   | 323 0 0   |
| J. & F. May                    | 315 0 0   |
| R. Crane                       | 310 0 0   |
| T. Green & Son                 | 285 0 0   |
| T. Potter & Sons               | 268 10 0  |
| J. Attwood, Stourbridge        | 228 0 0   |

\* Recommended by the Works Committee for acceptance.

LONDON.—For pulling down the existing infants' water-closets, latrines, &c., at the Curtain-road (Shoreditch) School, re-building new water-closets for all departments at a further distance from the school, and carrying out other works at the same school, for the School Board for London. Mr. T. J. Bailey, architect.—

|                 |          |
|-----------------|----------|
| T. Linfield     | 2588 0 0 |
| Stevens Bros.   | 675 0 0  |
| Stevens Bros.   | 681 0 0  |
| Barrett & Power | 649 0 0  |
| O. Dawson       | 630 0 0  |
| Norris & Luke   | 584 0 0  |

\* Recommended by the Works Committee for acceptance.

LONDON.—For removing old water-closets, erecting new water-closets for all departments of the Caledonian-road, Islington, School, and other works, for the School Board for London. Mr. T. J. Bailey, architect.—

|                  |          |
|------------------|----------|
| Davis Bros.      | 2598 0 0 |
| T. Linfield      | 585 0 0  |
| H. G. Heywood    | 508 0 0  |
| King Bros. & Co. | 449 0 0  |
| Stevens Bros.    | 437 0 0  |
| Stamonds Bros.   | 437 0 0  |
| C. Cooke         | 358 0 0  |

\* Recommended by the Works Committee for acceptance.

LONDON.—For removing two iron buildings from the Purrett-road, Plumstead, and re-erecting them in Merton-road, Wandsworth, for the School Board for London. Mr. T. J. Bailey, architect.—

|                |           |
|----------------|-----------|
| J. C. Wadman   | 2580 10 0 |
| A. M. Deacon   | 418 0 0   |
| North & Son    | 300 0 0   |
| J. J. Richards | 298 0 0   |
| J. W. Smiles   | 264 7 8   |

\* Recommended by the Works Committee for acceptance.

LONDON.—For rebuilding No. 52, Featherstone-street, City-road. Mr. H. F. Bacon, architect.—

|                |           |
|----------------|-----------|
| Hocking        | 21510 0 0 |
| Lawrence       | 1210 0 0  |
| Jackson & Todd | 1189 0 0  |
| Rabey & Son    | 1169 0 0  |
| W. Shumner     | 1143 0 0  |
| Newton         | 1111 0 0  |

LONDON.—For additions and alterations to No. 172, Brompton-road, S.W., for The Athletic and General Supply Company. Messrs. Branden & Henderson, surveyors, 3, Barbican, E.C.—

|                |           |
|----------------|-----------|
| W. Dunn        | 2469 19 0 |
| N. Maskell     | 492 0 0   |
| Mason & Co.    | 490 0 0   |
| A. Church      | 485 0 0   |
| J. Years & Co. | 482 0 0   |
| G. V. Collier  | 480 0 0   |
| Norris         | 415 0 0   |

LONDON.—For additions, alterations, and new shop-front to No. 88, King William-street, E.C., for Messrs. Charles Straker & Sons, Bishopsgate-avenue. Messrs. Branden & Henderson, surveyors, 3, Barbican, E.C.—

|                      |          |
|----------------------|----------|
| Sage & Co.           | 2460 1 0 |
| S. R. Lambie         | 468 10 0 |
| Draw & Cadman        | 425 10 0 |
| J. Years & Co.       | 350 0 0  |
| A. Church (accepted) | 312 0 0  |

LONDON.—For alterations and repairs to No. 172, Great Titchfield-street, W., for Mrs. Morris. Messrs. Branden & Henderson, surveyors, 3, Barbican, E.C.—

|                            |          |
|----------------------------|----------|
| Thomas Atkinson (accepted) | 2339 0 0 |
|----------------------------|----------|

LONDON.—For the erection of a warehouse, No. 69, Tabernacle-street, for Messrs. Howes Bros. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove.—

|                    |           |
|--------------------|-----------|
| Wall Bros.         | 21294 0 0 |
| Woodward & Co.     | 1280 0 0  |
| James Smith & Sons | 1280 0 0  |
| Kilby & Gayford    | 1227 0 0  |
| J. Anley           | 1220 0 0  |
| Allen & Sons       | 1137 0 0  |

LONDON.—For erecting Priory Mansion, Kilburn, for Mr. John Harris. Quantities by the architect, Mr. Richard D. Hanson, High-road, Kilburn.—

|                    |        |
|--------------------|--------|
| G. Neal (accepted) | 24,537 |
|--------------------|--------|

LONDON.—For repairs at 16, North-street, Marylebone, for Mr. Lewis Spain. Mr. R. D. Hanson, architect. Scott.—

|                    |     |
|--------------------|-----|
| W. Oldrey          | 231 |
| J. Dars (accepted) | 364 |

LONDON.—For shop-front to 129, High-road, Kilburn, for Mr. F. Mulkinson. Mr. R. D. Hanson, architect.—

|           |      |
|-----------|------|
| W. Oldrey | 2115 |
| J. Green  | 116  |

LONDON.—For additional new curb-road story and other works, at No. 3, Bryanston-street, Portman-square, W., for Mrs. Wilson.

|                                                        |          |
|--------------------------------------------------------|----------|
| J. Haywood, 40, South-street, Park-lane, W. (accepted) | 2350 0 0 |
| [No competition.]                                      |          |

PENRGE.—For alterations to Fenge Station, for the London, Brighton, and South Coast Railway Company. Mr. J. D. Hunter, Engineer.—

|                                                    |          |
|----------------------------------------------------|----------|
| J. O. Richardson, Albert Works, Peckham (accepted) | 2311 0 0 |
|----------------------------------------------------|----------|

PENZANCE (Cornwall).—For the erection of four villa residences, Lesudjack Estate, Penzance, for Mr. J. P. Cornish. Mr. J. Wm. Trounson, architect, 27, Clarence-street, Penzance.—

|                         |            |
|-------------------------|------------|
| Houlson & Co., Penzance | 21,631 2 0 |
| Carker, Redruth         | 1,498 0 0  |
| Alex. Fowler, Penzance  | 1,450 0 0  |
| Fellow & Co., Penzance  | 1,280 0 0  |
| Tredrea & Co., Penzance | 1,210 0 0  |

PENZANCE (Cornwall).—For erecting new shops and premises, 25, Market-jew-street, for Mr. J. H. Burs. Mr. J. W. Trounson, architect, 27, Clarence-street, Penzance.—

|                              |          |
|------------------------------|----------|
| Burnett & Walters (accepted) | 2850 0 0 |
|------------------------------|----------|

SHORTLANDS (Kent).—For the erection of new propagating and forcing houses at "Libiola," May's Hill-road, for Mr. R. S. Archibald. Messrs. Branden & Henderson, surveyors, 3, Barbican, E.C.—

|                      |          |
|----------------------|----------|
| J. Years & Co.       | 2147 0 0 |
| J. Dunham (accepted) | 130 0 0  |

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## Illustrations of French Renaissance Architecture.



THE attention of English architects was recently directed to a thoughtful essay by M. César Daly on the subject of "Hautes Études" in architecture, and the advisability of attempting a more systematic study of the intellectual basis of architecture, the causes which influence style, &c. One result of this has been that attention has also been drawn to an important work brought out by the same able author a few years ago, under the general title, of "Motifs Historiques,"\* which, as an important contribution to the study and illustration of one series of styles, is not as well known in this country as it should be.

The heading of this article, "Illustrations of French Renaissance Architecture," expresses what is practically the range of the book, consisting of two large folio volumes of finely-executed plates, preceded by an essay on the intention of the publication, and on some architectural considerations in connexion with it; the more wide field indicated by the title "Motifs Historiques" refers apparently to a further extension of the series, of which the two volumes form only a section. But the reasons which the author gives for having published this collection of examples of the details of the French Renaissance styles are of some interest in regard to the general theory of architectural practice in modern times. The prevalent architectural taste in France at present is for the reproduction of the native Renaissance styles; and if one client demands a house in the Louis XIV. style and another asks for Louis XVI., the architect must be prepared to satisfy each. This no doubt is not art in the proper acceptance of the word; but architecture is for most of those who practise it a "profession industrielle;" if it is true that man does not live by bread alone, it is also true that he does not live without it, and to gain it he must satisfy his client. This is not, it is admitted, the highest view of the

situation, but it is one which cannot be ignored; and it is partly to this end that M. Daly has offered his contemporaries a selection of examples of the various styles of detail and ornament of the French Renaissance, taken from old buildings of the period, and drawn out and engraved in the highly-finished style which has always characterised the illustrations of the *Révue Générale*, in the pages of which this collection was first published. So far, this only amounts to providing, for the architect anxious about his daily bread, examples to copy from and to overawe the client who may make any complaint. But this is only providing for the worst cases,—for clients bent on correct copying before anything else. The higher use which may be made of these examples is thus stated: "The architect is fortunately not always under the obligation to reproduce exactly the ancient forms of art; more often he is free to choose for himself the style which he prefers, and is under no necessity to look to old examples except for inspiration, for ideas,—*motifs*, as architects, painters, and sculptors say; themes, as a musician would word it,—which can be varied at his pleasure. Merely to reproduce the past, as has been observed, is not art; but to see in the combinations of an old fragment the *motif* of a new composition, and to evolve the latter out of it, is to some extent an act of artistic creation." Used in this sense, M. Daly goes on to say, the same example may become to various architects a *motif* to which each, while taking his first idea from it, may impart so much originality that the original *motif*, though at the bottom of the whole of the studies made from it, may be found to have become really lost from recognition under the individual development given to it by each architect. [This is no doubt the real way to make use of ancient models, but though it is sometimes talked about in this sense, it is in reality seldom practised: partly because it is so much easier to copy than to improve upon an old thing, partly (it must not be forgotten) because in many cases clients are so narrow-minded, and will not be satisfied that they are getting the right thing unless they are shown a chapter and verse for every detail.

Do you wish, for instance, says M. Daly, to design large folding-doors beneath a circular-headed arch, so as to harmonise them with the lines of the arch? You find an example in a Louis XV. front from rue du Cherche-Midi (vol. ii. plate 20). Or take another

problem: to design a large monumental-looking doorway beneath an arch the full height of the ground-story, and to connect the whole with the design of a window above the door, so as to produce a united composition: The Louis XV. doorway from the "Passage du Dragon" is a good suggestion. In neither case need the details be adopted; the idea and the general arrangement may be worked out with different details; perhaps improved upon; and no doubt this is the way to make use of architectural illustrations of ancient work. The last-mentioned example, we may observe, is a very fine and bold design of its kind, in which the rusticated walling of the ground-story is carried round into an arched recess with sides semi-circular on plan, and the actual door placed at the back of the recess thus formed; there is something like it in the treatment of one or two doorways in Portland-place, but unfortunately in cement, not in stone. These instances suffice to show the idea which M. Daly has had as to the use to be made of these collected examples. The plates are mostly geometrical drawings, comprising elevations, plans, and sections of mouldings; there are a few perspective drawings, generally of special features such as dormers, chimneys, &c. The majority of the drawings are of parts of buildings; doors, windows, pilasters, &c., with details to a large size, it being in such details that a great deal of the essential character of the various styles consists: here and there elevations of a part of the whole height of a building are given to show the general balance of the parts, but few whole buildings are given, the object being to give precedents and examples of the characteristics of the styles illustrated, not of the form and arrangement of particular buildings. The plates commence with examples of architecture of the transition from Louis XII. to Francis I., beginning with a good many portions of the Château de Blois, splendidly drawn and engraved. The Hôtel de Lasbordes furnishes some exquisite details of pure Francis I. style; pity to reflect that none of the succeeding phases of the French Renaissance were to show anything so refined as this. The same method of illustration is carried on down to the Louis XVI. style, the plates illustrating each style being numbered separately. To the illustration of the Francis I. style 30 plates are devoted; the Henri II. counts 17 plates; Henri III., 14; Henri IV., 21; Louis XIII., 30; Louis XIV., 27; Louis XV., 26; and

\* *Motifs Historiques d'Architecture et de Sculpture*. 4° Ornement—Première Série. Décorations Extérieures empruntées à des Monuments Français de commencement de la Renaissance à la fin de Louis XVI. (XVI., XVII., et XVIII. Siècles). Par M. César Daly, Architecte du Gouvernement, &c., &c. Paris: Ducher & Cie.



Louis XVI., 33 plates; the index is also adorned with various smaller illustrations of buildings mentioned. But we will turn for a moment from the plates to consider the views as to the Renaissance style expressed in the preface, which are of some interest.

M. Daly has gone here into the subject of the essential qualities which constitute "style." What are the resemblances between buildings which lead us to class them as of the same style? In the first place, he suggests, style is duplicate; it has its constructive form and its æsthetic expression: every recognised architectural style has its own principle of construction and its own æsthetic expression. True, of course, as to the latter; but to say that each has "its own principle of construction" is putting it rather too broadly. There are very few principles of construction in building; there is the beam and post, the arch, with its various applications of the dome and the vault; there is the truss or girder, but these, after all, in regard to the whole building, are only a form of the beam principle. If we limit separate styles to those with a principle of construction special to themselves, we shall have very few styles indeed, and shall have to entirely revise our classification and our nomenclature. It would be more correct if we were to say "its own system of construction" for each style; "principle" is too extended and comprehensive a word; and in M. Daly's continuation of the subject the expression "système constructif" is, in fact, used, and that we accept as expressing one of the leading distinctions of style, but it is not the same thing as "principe de construction," which includes a great deal more. The differences in the system of construction are most marked in the manner of covering openings in the walls, and the manner of covering in the area of a building above; or in the author's own words, "Un méthode pour franchir les vides linéaires (premier degré du problème) et les vides superficiels (deuxième degré du problème). Un style n'arrive à sa perfection organique, comme nous le verrons, que lorsque se double problème est résolu par le même élément géométrique, et que cet élément est aussi celui qui exprime le sentiment esthétique des contemporains." He goes on to remark how the Greeks used the same system for covering both the wall opening and the area; the Roman being a mixed style in this respect, and the Byzantine purely round-arched; the Gothic purely pointed arched. "In constructive system then, architecture started from the straight line to arrive at the pointed arch" in its covering system.

"Ainsi, chacune des grandes formes historiques de l'architecture, universellement reconnues comme constituant des styles distincts, offre ce double caractère: un système spécial de la construction, et une esthétique qui lui est propre; système constructif et conception du Beau conduisant tous deux à l'adoption d'une même forme géométrique comme base du style, et montrant ainsi l'accord qui a toujours existé, à certaines périodes de l'histoire, entre les besoins de l'esprit et les sentiments de l'âme, entre les facultés rationnelles et le sensibilité esthétique. Telle est l'analyse du sens qu'il faudrait attacher à l'expression: 'un Style de l'Architecture.'"

Then comes the question, on this definition of style, is the Renaissance a "Style" or "has there been a new style of architecture since the fifteenth century?" M. Daly finds that the Renaissance did introduce a new constructive and expressive element into architecture, namely the three-centred or elliptic arch, which constitutes, to his thinking, one of the "traits significatifs" of modern architecture:—

"On retrouve les courbes elliptiques franchement acouées, dans notre pays, sous tous les rois, depuis la fin du XV<sup>e</sup> siècle jusqu'à la fin du XVIII<sup>e</sup>. Abandonnée un moment pendant la domination de l'Ecole doctrinaire ou classique d'architecture du premier Empire et de la Restauration, l'ellipse est apparue de nouveau dans nos monuments, depuis que l'étude de nos édifices nationaux de tous les siècles a pris faveur parmi nous. L'Arc elliptique figure aussi dans quelques rares constructions de l'antiquité, accidentellement il est vrai, mais assez pour prouver que celle forme a été connue des vieux Ages, sans quelle ait eu la puissance, antérieurement aux temps modernes, de satisfaire au sentiment esthétique des populations."

In the ellipse, then, M. Daly thinks the Renaissance found that "forme mère," which has been shown to be the necessary origin and foundation of every perfect style of architecture. The predilection of English architects of the new school for the elliptical arch is a fact to be noticed in connexion with the subject; it has certainly become a characteristic of the new English Renaissance, as it was to a considerable extent of the Queen Anne and Georgian architecture. It would be weighting the elliptic arch rather heavily, however, to make its presence the constituent of a separate style, nor do we gather that M. Daly wishes to lay that burden upon it. He rather points it out as a factor in a new style which has not yet been systematically worked out. As he observes, engineers in modern work have used it for scientific reasons, in bridges; and architects have used it for picturesque and æsthetic reasons: each use of it has been one-sided. M. Daly hopes, or at least suggests the possibility, that its æsthetic and mechanical properties may one day be the subject of systematic study: is it possible, he asks, that from this form a new style of architecture is to spring, assisted also by the influence of various materials so much more used in modern than in ancient architecture, iron more particularly? That is the secret of the future; but the whole suggestion in regard to the possible influence of the elliptical arch is interesting and worth following up further. A general synopsis or table of generations, a family tree, of the past and possible styles is given by M. Daly, in which we have first the two styles (*Styles Primaires*) of the "Ligne Droite," Egyptian = rectilinear evolution in the first degree; Greek = rectilinear evolution in the second degree. We confess we are totally at a loss to understand why Egyptian and Greek architecture represent the first and second degrees respectively, as those degrees were before defined. It cannot be said that Egyptian architecture only covers over "vides linéaires," and not "vides superficiels," though it may be admitted that the Greek achieves the latter more completely and scientifically. Then follows the Roman as the transition from straight-lined to curvilinear styles, a "Mixte" which intervenes between the styles of "Ligne Droite" and those of "Arc du Cercle." The latter (*Styles Secondaires*) are divided into simple curvilinear evolution of the first degree (Byzantine and Roman), and simple curvilinear evolution of the second degree (Gothic). If the first stand for round-arched and the second for pointed-arched styles, this is intelligible; but it does not tally, again, with the former definition of first and second degrees. Then follows another "Mixte" period, transition from "simple curvilinear lines" to "superior curvilinear lines," leading to the two sections of ellipse style (*Styles Tertiaires*) of which the evolution in the first degree is now in progress, the evolution in the second degree has yet to come. All this is put in a beautifully logical manner, and though things in artistic development do not arrange themselves quite so systematically as this, there is really a good deal in it that is "probable to thinking," and it may turn out more true in fact than is at first apparent.

It results naturally from the foregoing considerations that the Renaissance architecture in France cannot at any of its periods be reckoned as entitled in the fullest sense to the denomination of a "style," though the architecture of the periods of Francis I. and Louis XIV. approaches very nearly, in M. Daly's judgment, to the condition of a style, owing (especially in the case of the Francis I. manner) to the remarkable unity of feeling which pervades these styles (for we must still for convenience use the word), and the manner in which they were adopted over the whole country. But he would point out that this apparently national character was not national in the same way which characterises the architecture of Egypt and Greece and the middle ages, all of which were developed from the

habits and artistic inclinations of the people. The national character of the French Renaissance styles, especially of the two reigns just referred to, is imposed from above instead of growing from below; the unity is the unity influenced by despotic power; it is the product of the royal authority which says "L'Etat, c'est moi." In the case of Francis I. the despotism was partly an intellectual one, that king, through his own taste and the of the great artists whom he collected around him, influenced the national taste in a more legitimate manner than by mere despotic force of will; but on the whole there can be little question that M. Daly's distinction between these and the genuine national styles is correct; they are styles of the court and aristocracy, not of the nation.

The Francis I. style has, in its full development, more to our mind of the characteristics of a style than any of the other varieties of the French Renaissance. It achieved in a great measure what is at any rate the most important step towards the evolution of a new style out of old materials, viz.: the harmonising of what at first sight might seem incongruous elements. The mullioned window and the encadrement of pilaster and frieze appear, in the best examples of Francis I. architecture, to have always belonged to each other, and we quite lose the sense of their being survivals from two different styles and periods of architecture. With a remarkable tact and perception of congruity and proportion, the Classic pilasters, in such an example as that given by M. Daly from the Hôtel de Lasbordes, are assimilated to the mullions by being thinned down to more slender proportions than their Classical anti-types; so that the pilaster comes to be, in geometrical aspect, little wider than the mullion, and partakes of the decisively vertical character of the latter. It is true the pilaster is flat and carved on the face, and the mullion is moulded on the "chamfer-plane," but the two details seem to go together in some way. The unity is hardly so complete when small Classic columns of the usual proportion are substituted for the pilasters on other side of the mullioned window. The Caryatid figures from another window of the Hôtel de Lasbordes, however, of the Henri II. period, show well enough on either side of the quasi-Gothic window. The finish of these Caryatides, which are woman to the waist only, is characteristic of the extravagances of the day; it consists of two fluted scrolls, crossed and recrossed, and turning up at the ends into human heads. Another window from the same building, with male supporting figures, shows crossed lions' (?) legs, a still worse and more repulsive kind of detail.

In the Henri II. examples we find the Gothic mullion, in its masonic form, departed, and its place taken by wooden sash-bars, with very inferior architectural effect; and in place of the flanking pilasters and columns, we find pilasters of the Elizabethan form (apparently first suggesting themselves here), diminishing downward. The Italian forms of architrave begin to appear, and in the Hôtel d'Asszat, at Toulouse, in place of the elegant moulded mullion of the Francis I. style, we find a large heavy transom of square section, with console uprights in the centre of the window. In the Château d'Ault we find the Roman orders in full swing: the Doric on the ground story, Ionic above (with the window with square-section transoms and mullions between), and Corinthian at the top. The detail ornaments have a manner of their own; they are Classic in general form, yet with a certain Gothic breadth about them. With the Henri III. period we get the window dressings built up into more elaborate compositions, on which the spirit of Rococo is already beginning to breathe: the en-framing pilaster has disappeared, the Classic details begin to form a part of the design instead of being merely a frame to it. In the door from a house in the rue de la Pomme, at Toulouse, we find a door and window, one over the other, each flanked by orthodox columns, Roman Doric below and Corinthian above; but the characteristic detail is the big scroll



ading in a kind of guilloche, which is stuck a, for no possible use and with no reference to the general design, on each side of the upper columns; a kind of foretaste of what is to come in the days of Louis XIV. The extent and rapidity of the changes in taste as to detail, in the course of a few years, is evidence at all events of the vitality of interest in architecture at the time; the constant effort at improvement (for each change was no doubt regarded as improvement by those who made it), and rapid abandonment of the old manner for the new. In the Henri III. and IV. manner, we find the treatment of the pilasters quite altered; a system of rather heavy fluting superseding the old elegantly-carved pilaster panels: more architectural in a sense, but less graceful. The designs of doors and windows begin to show a system of putting together Classical details in a kind of piecemeal fashion, as if they were put together by a joiner rather than as if built on masonic principles. In the Henri IV. period ornament begins to get big and florid; cornucopias flourish on the cornices of windows, or oval "fanlights" are mantled in carved drapery. The descent from the Francis I. style, in taste and refinement of detail, is melancholy. In the style of Louis XIII. begins that peculiar love of curves and twists in decorative detail which was carried to such an excess in the succeeding reigns. One of the most marked examples of this is in the details from the Protestant church in rue St. Antoine, where we have the cartouche in full development; also seen on a door from the old Sorbonne buildings. Among the good examples is a fine and sumptuous pair of entrance doors from a house in Rue Pavée-St. André-des-Arts, Paris, with panelling designed in a very effective fashion, and a carved acanthus frieze crossing the doors at the springing-line of the arch: Mr. Blashill will find this door (Plate 8 of Louis XIII.) worth his attention.

The Louis XIV. style, as far as its merits are concerned, is essentially an interior style. Regarded as exterior architecture its roccoco ornaments are tawdry and frivolous, but regarded as room-decorations they have a merit of their own which is sometimes overlooked by those who (rightly) condemn the style as vulgar and ostentatious. It is so; but it is more of a style, decoratively speaking, than any other French Renaissance style except Francis I. In the intermediate periods there was a good deal of jumbling of incongruous details; florid ornament along with stiff and square architectural forms. In the Louis XIV. style the whole of the details have become assimilated; there is a unity about it; and, bad as much of it is in detail from the standpoint of pure taste, it produces as a whole a decidedly rich decorative effect. A room well decorated in this style, and without considerations of economy (which is nowhere in Louis XIV. work), has a remarkably palatial look, and the decoration is generally well distributed and massed; as long as we avoid looking too much at the details or "considering too curiously" their relation to art and nature, we receive a general impression of sumptuousness carried out on a system, and there is more power in the detail than in the more refined fripperies of Louis Quinze, of a good deal of which it may be said that they display all the bad taste of Louis Quatorze without the unity of style and power which often characterises the latter.

In a purely architectural point of view the style Louis XVI. is superior to either, in that it brings the ornamental work more within the guiding-lines of the architectural framework. Indeed, as a piece of street architecture of the Classic type, the front of a house in the rue des Francs-Bourgeois, given by M. Daly as the first example of Louis XVI., is in admirable taste. This is a house with simple square-headed windows in a rusticated basement story, above which is a Roman Doric order of fluted pilasters with two stories of windows between, with a wide flat fluted string-course or frieze separating the lower from the upper

windows. All the carved ornament is concentrated on the doors and over the door opening, with a little bit of carving marking the centre window of the first floor. There is a purity of taste about this elevation which is remarkable for the period, and the whole is admirably proportioned and composed. The Hôtel d'Entraques, rue de Tournon, has similar merit, though it is a more utilitarian and less Classical composition.

The whole collection of illustrations is one of great interest and beauty, very well selected as furnishing typical examples of the period of architecture illustrated, and a most valuable work for reference and study in regard to French Renaissance architecture.

NOTES.



Monday last Lord Lamington made an attempt, as he has done once or twice before, to impress on the public mind through the House of Lords that national architecture is a matter worth thinking of. He pointed out how the discussion on the War and Admiralty Offices had been going on for twenty-five years, and yet nothing was done, while the country was paying a large annual sum for the hire of rooms in a nest of mean buildings. The country had been assured that steps would be taken to provide a suitable building for the National Portrait collection, but nothing more had been heard of it. Lord Lamington went on to draw the same kind of comparison between the attention paid to architecture in this and in Continental countries which we have often drawn. He said that "this seemed to be the only country in the world where no interest whatever was taken either by the rulers or the people in the beauty of its metropolis. In Rome, Paris, Berlin, and Vienna the public buildings were worthy of great capitals, and even in our colonies the people took great interest in their public buildings; but here nobody seemed to care. With regard to the new buildings on the west side of Westminster Hall, he admitted that outside the work was well done; but inside it had been discovered that there was no space, according to the plans, to make a necessary passage, so that the rooms ran into one another and were no use at all." Lord Lamington has missed the real point about the Westminster Hall "restoration" (at least if his remarks are fully reported), which is that it is building done under pretence of restoring something that was there before, and not on any grounds of architectural propriety or practical usefulness, which have only been pretended afterwards in order to justify the scheme to an ignorant and indifferent public. Lord Henniker answered in the usual commonplace; these questions had been answered several times before, &c., &c. It is characteristic of the state of public opinion on the subject of architecture that the *Times* in a leading article dismisses Lord Lamington's appeal about national architecture with a sneer, but refers to "a question of much greater moment" asked by Lord Fortescue, in regard to the threatened infringement of the building frontage in Marylebone-road! That is the way things are looked at in this country, and in this respect the *Times* is the true exponent of English public opinion. The advancement of national architecture, the erection of public buildings worthy of the nation, is a matter to be dismissed as a joke; but over a question of frontage-line we can become eloquent and enthusiastic.

IN our article last week on the Forth and Clyde ship canal scheme, the disabilities under which the existing Forth and Clyde Canal labours were, perhaps, scarcely put so definitely as they might have been. As stated, the canal presents twenty differing levels, requiring that number of locks to surmount the series, from the lowest or sea-level to the highest or summit-level; but it has to be remembered that these variations are of necessity in duplicate, to admit of a corresponding descent on the other side of the

isthmus; and in point of fact the actual number of locks encountered between the two seas is thirty-nine, representing a proportion of rather more than one stoppage for every mile of the way. Moreover, the canal is to a large extent an elevated or overborne work, affording passage underneath for many of the roads, railways, streams, and drains intersecting it,—a condition which of itself alone appears to shut out all practicable possibility of deepening or widening, except on the most meagre and incomplete scale.

THE thirteenth "Hallisches Winkelmanns Programm" is an interesting contribution to the literature of Praxitelean art. Dr. H. Heydemann publishes for the first time a marble head now standing in the courtyard of the Palazzo Riccardi, at Florence. Probably few who go to the Palazzo to see the wonderful Benozzo Gozzoli frescoes have ever given it a look. It is, however, as Dr. Heydemann clearly shows, an echo, and no faint one, of the statue of Eubouleus by Praxiteles. Since Dr. Bendorff's acute identification of the Eleusis head, now in the Central Museum at Athens, the hero Eubouleus, whose very name was matter of obscure mythology, has been a prominent figure in the archaeological world. The Eleusis head, which Dr. Bendorff believes to be the original, is much damaged. The nose, upper lip, and eyebrows are almost entirely broken away. It is only when these are restored, and specially in seeing the face in profile, that the marvellous likeness to the Hermes of Praxiteles comes out. The Riccardi head is almost intact, so that it affords valuable material for the restoration of the other. Dr. Heydemann fully accepts Dr. Bendorff's identification, and differs from him only in this one point—that he does not accept the Eleusis head as an original. Dr. Heydemann, while doubting this, candidly states that his adverse view,—based chiefly on the technical working of the chisel-marks, and especially in the treatment of the drapery,—is formed only from a study of a cast. He gives in two phototype plates the side and front views of the Riccardi head, and four views of the Eleusis head—two of the original state of the marble, and two of it restored. To his very interesting criticism he adds a discussion of the other possible art representations of Eubouleus on vases and sarcophagi.

SOME of the good people at Bath seem to be making a very foolish agitation for a new civic coat of arms for the city, apparently on the ground that the arms should be authoritatively made identical with those on the city maces, which only date from 1708. Bath had a coat of arms confirmed in 1603, emblematical of Bath as a city of waters, which is therefore a century older than the one which it is desired to confirm now. As the whole value of a coat of arms in these days lies in its antiquity, as forming a historical connexion with the past, the attempt to substitute a more recent one, of apparently irregular origin, seems very absurd.

DR. BLAXALL'S report to the Local Government Board, dated 1st February of this year, on the state of the Keynsham Rural Sanitary District, deals with the causes of an excessive mortality from scarlatina in the sub-district of Bitton. The report confirms complaints which had been unofficially made against the Keynsham Rural Sanitary Authority for neglecting its duties in regard to provision for drainage. The following quotation from the report indicates the nature of the neglect complained of:—

"The Kingswood Hill sewer was laid down in accordance with a plan devised by the late Inspector of Nuisances. I am told it is constructed of glazed pipes, but the information forthcoming as to whether the joints were properly cemented is conflicting. No provision has been made for flushing it; nor, until recently, for its ventilation; but now one 6 in. ventilating-shaft has been inserted. . . . This sewer runs open during part of its course, receiving on its way the contents of a sewer from Poor House-lane. Both sewers pass in the near vicinity of dwellings, and loud and general com-



plaint was made to me of great nuisance arising from them throughout their course. I am informed that proceedings have been threatened against the Authority.

I have no doubt of the urgent necessity of prompt remedial measures in the matter of sewer provision for the district.

There are no proper means of disposing of the sewage of the district, but the several sewers discharge into streams and brooks that flow into the river Avon, which receives also the sewage of the city of Bath and other towns situated higher up its course. With regard to this highly-polluted river, one cannot but feel apprehensive lest it might become a means of disseminating disease amongst residents along its banks, and bargemen and others employed on its waters.

The Bristolton brook is so intensely polluted by sewage as to create unbearable nuisance, and I heard of several instances in which cases of illness had been ascribed, apparently with justice, to the effects of effluvia arising therefrom. Summer after summer has this brook been the source of trouble to the Authority, who have expended a great deal of money in cleansing it and in putting down and working hatches to dam the water; but they have never gone to the root of the evil by providing for the removal and proper disposal of the sewage instead of allowing it to go into the brook.

In a further paragraph the report says:—"From the description already given of the sewers, drains, and privies, it is evident that the soil around and about dwellings is saturated with filth, and that any wells sunk in this soil must run constant risk of pollution. I found the distance between the wells and one or other source of contamination to vary from 6 or 8 ft. to as many yards, and more. Not infrequently percolation into the wells was seen from the direction of cesspits."

NO. 14, Regent-street, which is to be put up for sale next month, is the house which John Nash, architect, built for his own occupation, when, under the Act 53 Geo. III., c. 120 (1813), he transformed the line of Edward, Bolsover, and Swallow-streets, and parts of Vine, Air, and Castle-streets, together with portion of St. James's Market, into the present Regent-street, Quadrant, and Waterloo-place; and thus carried out Gwynne's earlier project, at a cost exceeding 1,530,000*l*. The several blocks of buildings were designed by himself, Abraham, Decimus Burton, Soane, Repton, and others. The next house, No. 16, at present the Raleigh, and formerly the Parthenon Club-house, Nash built for Mr. G. Edwards. To his own residence he added a large apartment, copied from a loggia at the Vatican, and had it decorated with copies of some of Raffaele's pictures. He died at East Cowes Castle, aged 82 years, on May 13, 1835. At Easter, 1849, this house was opened under the name of the "Gallery of Illustration," for the exhibition of Messrs. Grieve & Telbin's popular diorama of the "Overland Mail." It since formed the home of Mr. and Mrs. German Reed's entertainment. After the removal of that company to St. George's Hall, in Langham-place, the gallery was converted into the Pall Mall Restaurant; and has latterly been occupied by the Junior Constitutional Club. This property is held directly from the Crown for a term of 99 years, from 5th April, 1819, at a yearly rent of 454*l*. 11*s*., which includes a payment in lieu of land-tax, and is now let on lease at 1,300*l*. a-year. The rack-rent is estimated to be worth over 2,000*l*. per annum.

THE Whitehorse Close, near Holyrood Palace, is well-known as one of the most picturesque "bits" of Old Edinburgh. It has been for some years in a state of decay, many of the quaint gables which give it character being formed of wood; and, in passing, it may be noted that the native timber originally used is less decayed than the portions which have been patched-up with imported timber. The whole building is undergoing restoration, at a cost of 2,400*l*., and every endeavour will be made to retain its ancient characteristics. The building is now divided into numerous small dwellings, but the "White Horse Inn" was originally the principal inn of Edinburgh. It was here that Dr. Johnson put up when on his Scotch tour.

THE annual report of Mr. John Price, the Surveyor to the Toxteth Local Board, Liverpool, contains some useful experience and statistics in regard to sanitary work in his district. It appears that the Board once a year flush out the drains of each dwelling-house, every gully, water-closet, or trap receiving attention; the men clean out the traps, but should anything be so closed up that flushing will not effect a clearance, then it is entered in a book, and a return made to the Nuisance Department, who then serve the necessary notice. This amounts to a practical yearly inspection, and is carried out at a rate of 1*s*. 4*d*. per 1,000 per annum, at a density of 16 per acre. The following passage in the report is also worth noting:—

"It having been discovered that a portion of the Hartington-road Sewer, between Boswell-street and Smithdown-road, was low and out of gradient, it has been altered by raising the invert to the proper gradient with cement concrete, thus preventing to a great extent the deposit of sediment,—a most fruitful source of bad smells. The deposit chiefly found in the invert of sewers having fair gradients consists of road detritus, and this is a great argument in favour of having the gullies near together and frequently emptied."

The report is very clearly and systematically drawn up.

THE Museum of Science and Art in Chambers-street, Edinburgh, is now completed, with the exception of the three groups of sculpture upon the pedestals above the cornice over the main entrance. The commission for these has been given to Mr. John Rhind, and the sketch-models for the groups have been approved of by the local representative of her Majesty's Board of Works and Sir R. Murdoch Smith, R.E., the Curator of the Museum. The central group will consist of a female figure, 10 ft. high, representative of Science, having a lamp in her left hand, and on her right a skeleton globe. On either side there are seated figures representing,—on her right,—the engineer or metal-worker, holding a wheel, while beside him is a model of Nasmyth's steam-hammer, and at his feet there is a boy with a miner's pick in hand, and safety-lamp on his head. The figure on the left, representative of textile manufactures, is seated on bales of cloth, and carries a bobbin and spindle, and at his feet there is a boy with additional symbols. This group will be upwards of 15 ft. in width. The two side groups will each consist of a central figure about 6 ft. in height, with attendant figures extending to a width of 6 ft. 6 in. One of these is to be representative of Natural History, and the other of the Applied Arts. The principal figure in the Natural History group will be seated on a camel, supporting on her knee a lion's skull. A small figure with a pelican and serpent completes the group. The large figure in the Applied Arts group carries a palette and brushes; while the minor figure is engaged in chasing a casket. The sculpture is to be executed in Duddingstone freestone. The groups are expected to be ready for placing in position in the course of the ensuing summer.

AT the exhibition at Messrs. Tooth & Sons' Gallery are to be seen three new works by Meissonnier, two of them representing the finest qualities of his art. One of these is a water-colour on a much larger scale than the old class of Meissonnier works. It is entitled "Vieille Poste Française" (28), and is a street scene in an old French town, where a man on horseback, with a led horse, is talking to two women at the door of an inn. The horses are splendidly drawn, and the open-air appearance of the scene is remarkably true. "En Reconnaissance" (29) is an oil-painting in the old style, also remarkable for the splendid drawing and painting of a horse in a fore-shortened position; the character in the figure looking through the field-glass is also in Meissonnier's best way. The other is a single-figure painting of less interest: "On Guard" (37). To see three new Meissonniers

ought to be no little attraction to this gallery. Among the other works are a remarkable "Le Jardin du Poète" (125), a pellent to our taste, but a wonderful tour de force in colour; some good landscapes by new Scotch artist, Mr. David Farquhar, especially "Strathay" (81); a fine acromical work, "A Siesta" (52), by Herr Kiese, some clever little battle scenes, especially "Ambush" (41), by Herr Velten; a picture of Sadée's (122), which we seem to know; and a small picture by Mr. Godwin (110), which is the best imitation of M. Tadmé we have seen, and promises well to its author when he gives up imitating.

A CORRESPONDENT suggests that the London County Council might find a fine site for a new building for their offices the ground now occupied by the old Sessions-house, close to the Westminster Hospital. The site is, we believe, open to purchase, as was talked of for a modern building before. The position is almost an ideal one as far as it goes; but unless some of the neighbouring property could also be acquired, there would not be room enough, as the ground occupied by the Sessions-house itself is much too small; and unless the whole of the Stationary Offices and their adjuncts were cleared away, part of the site would have the character of back-land. It is the Sessions-house site only that stands well as things are at present. We give currency to the suggestion, though hardly regarding it as a practical one.

LORD MAGHERAMORNE could hardly have done better to increase the contempt with which the Metropolitan Board of Works has been recently regarded than the tone and manner of his reply to Mr. Fortescue's appeal that the Board should postpone action in regard to the Marylebone road frontage, and leave it to be dealt with by the County Council. Most people would suppose that the proper attitude for a Board just going out of office was to avoid legislating on debatable matters. But the Chairman of the Board seemed to think this an opportunity for posing in magnificent attitude, and intimating loftily that the Board did not intend to be interfered with by the County Council in the execution of their duty. In reply to a natural comment from the Earl of Kimberley that this doctrine was not in accordance with the duty of a public body in the position now occupied by the Board, Lord Magheramorne thought it evident that the noble lord who had last spoken had not studied the subject in such a manner as to enable him to instruct their lordships up to it. This is truly delightful as coming from a man who is well known to be a mere ornamental chairman with no practical knowledge of building work, whose sole part has been to keep order at the meetings of the Board, and who could not always do that.

#### CONSTRUCTION.\*

BY PROFESSOR AITCHISON, A.R.A.

As architects, our sole object in studying the architecture of nations that have passed away is to improve ourselves in our profession.

As architecture is the visible expression of building of such of the needs, knowledge, and taste, and the ruling passion of a nation as can be so expressed, we first try to discover from the building or ruins what the needs were, and how they have been provided for, and what the ruling passion, what was the knowledge, the skill of the architect, and how his canons of taste agree with ours. We then try to find more, and to test our solutions by the study of the nation's literature. Architecture, too, as far as the architect is concerned, is compounded of the diverse elements, which may be roughly said to call for ingenuity, science, and taste. It would therefore ill become me in any case to omit it.

\* Being the Sixth and concluding Royal Academy Lecture on Architecture this Session, delivered to the Students of the Academy on the 14th ult. (For the previous lectures see *Builder*, pp. 55, 103, 121, 146, 182, and 181, *ante*.)



consideration of any one of them; but when studying Roman architecture, to omit the scientific side would be to leave out the part in which they have shown the greatest mastery; and when I use the word science, I do not use it in the modern sense of mathematical formulae, based on experiment, but that skill which is the result of keen observation and experience.

The all-conquering legions of Rome did not more clearly point to strength, activity, endurance, courage, and discipline in the men than these qualities pointed to the excellence of their system, and to the wisdom and skill of those who brought these qualities to perfection, and to the organising power, the strategy, and tactics of the general. In like manner, the gigantic structures of the Romans point to the science, ingenuity, and the peculiar æsthetic gifts of the architects, to the knowledge, skill, and care of the surveyors,\* the organisation and integrity of the builders, the honesty and skill of the workmen, as well as to the national pride in the permanent, magnificent, and dignified. Roman architecture, from the later time of the Republic to Byzantine days, was almost wholly clothed architecture: when built it was complete in itself, faced as it was with neat brick or ingenious stonework, and had then to be turned over to the art architect to clothe it, neatly or handsomely as the case required, when it wanted clothing,—i.e., either with stucco, or with splendid marbles, bronze, and glass mosaic. I said it was almost wholly clothed, for the points of support, where the timbers or groined vaults rested, were, in magnificent buildings, columns of marble, granite, or porphyry. When substructures were to be made in Rome and the neighbourhood, the trenches could be cut vertical with the help of light planking and strutting; the shoring boards were put against the sides of the trench and uprights in front of them; a bed of mortar from 4 in. to 6 in. thick was then shovelled in, and on this was shovelled a course of broken stone about the same height, each stone not exceeding 3 in. or 4 in. in diameter, and these were rammed into the mortar until it appeared on the surface. Vitruvius (Lib. 8, ap. 6) describes how the walls of rain-water tanks were made:—"In signine works these things are to be done: thus, in the first place, the purest and roughest sand is to be got; rough lints are to be broken not heavier than 1 lb.; at the strongest lime be mingled in the mortar, so that five parts of sand may answer to two of me; let the matrix be added to the mortar; with this the trench, up to the future level of height, must be rammed with iron-shod wooden rammers. From these rammed walls, the earth which is in the middle must be dug out to the level of the bottom of the walls; its only being levelled, is to be rammed to the thickness which has been decided on." This is the only account of rammed concrete I find in thick stone facings. I may say here that built scaffolding seems to have been used, except when the walls were enormously thick; rough putlogs were built through the walls projecting at each end for the scaffold boards, and run off flush, when the work was done. In the case of very thick walls or piers, where the attilogs only went in a short way, scaffolding like our own must, I fancy, have been used, or else the putlogs must have been supported by masonry piers.

Walls and piers were invariably built on the same principle, though the materials might be different, except in those cases only where, for appearance sake, the walls were of solid marble-hewn stone, or where quarries of good building-stone were at hand. I speak now of the ordinary methods; if the building was in a one country, particularly where the stone was of small scantling, or of poor quality, the walls were of stone rubble, the facings being of small square stones about 2 in. across, roughly worked, and tapering from the face inwards, and laid with one point of the square downwards, forming that network called *opus reticulatum* (see ink-photo illustration). The first course was to shovel on mortar, and, as each course of the neat facing was bedded by the mason, the interior was filled in by the hand of the labourers with a course of rubble,—i.e., broken stone in small pieces, or of chips,—and laid with the larger surface horizontal. Another bed was then made by shovelling in more mortar, and another course was then laid

as before. At regular intervals, usually from 4 ft. to 5 ft. bond-courses, mostly of burnt brick, were carried through the wall (see ink-photo illustration). In the case of brick being the material used, and each being put from 1½ in. to 1¾ in. thick (such as we call a tile), these tiles were of various sizes. Twelve-inch tiles were mostly used for facings in moderately thick walls; these were cut into four triangles, with the extreme points of the long side nipped off to make a better vertical joint, so that the tiles were usually about 11 in. long on the face without the joint, the long face of the brick triangle having its native skin on, being outside, so that, with the joints, about 4 ft. run of facing was made out of one 12-in. brick, and in the same manner as the stone wall, only with brickbats instead of stones. About every 4 ft. 3 in. one course of bonders was carried through the wall. In thick walls the bond-tiles were about 2 Roman feet square. This system universally prevailed, even in 9-in. partition walls.

Vitruvius gives directions for making mortar (Lib. 2, cap. 5). He says, "If pit-sand be used, three parts of sand are mixed with one of lime; if river or sea sand, two of sand is to be thrown on one of lime," which, I may add, is much too fat and weak; for when the mortar is three or four to one it is nearly twice as strong as two to one; but, he adds:—"If a third part of pounded and sifted potsherd is added it will make the composition better for use," which is undoubtedly the case. He also recommends the use of pozzolana from Baia, or about Vesuvius, for waterwork. So, I suppose, the pozzolana of the Roman Campagna had not then been used. In speaking of *opus reticulatum* he says (Lib. 2, cap. 8):—"It is more beautiful than *opus incertum*, but apt to crack, because it has a bad bed and bond." And he recommends "the pieces of stone to be very small, so that the wall being full of mortar may last longer; for when the stones are soft and of little power, they dry it by sucking up the water from the mortar; but when there is abundance of mortar, the wall having more wet in it, does not so quickly perish." This is called the water of crystallisation, and if the bricks or stones be porous and unsoaked, the mortar perishes by the absorption of the water, and becomes mere dust. In brick house-walls of the last century this is often found to be the case; when the weight is off, the bricks can be lifted by the hand from their beds of mortar dust.

Arches were treated precisely in the same manner; the face was made of the usual tiles, only they were not triangular, but oblong, and from 6 in. to 8 in. deep. Whole tiles were used at intervals, and mostly 2 ft. square, forming the skeleton voussoirs of the arch, these being filled with the rubble in horizontal courses, in continuation of the abutments (see ink-photo illustration). In later times, in the case of arches in thick walls, the face of the intrados was kept some 3 in. within the upright of the piers, the centering of the arches being formed on turning-pieces with 2 ft. tiles, and over these another course of 8 in. tiles, to break joint with those below. Not unfrequently tag-tiles were put in,—i.e., tiles on edge,—to secure the outer face to the rubble; in some cases an extra piece of tile is laid flat against the tag-tile, to prevent its toppling over. In the heads of niches, and those large apses commonly called exedrae, the brick face was carried up to just below the angle of slipping, and then the double skin of flat tiles began.

From whom the Romans learnt this method, or whether they invented it, I do not know; but it was one of the greatest strides in the building art ever made. Very little teaching is wanted to mix mortar, if the proportions are known; and in walls from 6 to 20 ft. thick, where the facings are but 6 or 7 in. thick, the proportion of bricklayers to labourers need be but small, for any one can shovel on mortar or lay brickbats or stones, the big side downwards. So that no system was so convenient, where slaves were in great numbers, or where the work was to be done by soldiers or by the forced labour of peasants or herdsmen, particularly when enormous and permanent buildings were wanted in haste in places where skilled labour was scarce or precious.

Stone buildings may be pulled down stone by stone, as they were put up,—as we have lately seen done in the triumphal arch at Constitution-hill. The same is the case with old brick-work in England, particularly when the mortar

had been made too fat and the bricks were dry, for when the roof is removed the bricks may be lifted out by the hand. Well-built modern London stock brickwork, with tolerably thick joints and good mortar, if the vertical joints are filled and the bricks have been soaked, is only to be cut through with a chisel or with wedges. Professor Middleton, who was in Rome during the destruction of some of the old rubble walling, says that dynamite was obliged to be employed to remove it. When I was in Rome I hoped to get the cracking strength of this rubble, but no experiments had been made, though doubtless the Italian Government will have this done.

By this invention the Roman architect was prepared to build in almost every locality, for brickbats, rough stone, stone chips, flints, lava, slag, and pebbles, were equally available, and one sort or another are mostly to be met with; nothing else was wanted but a few burnt bricks or some small roughly-cut stones for the facings, and some burnt bricks for bond. This facing, too, held up the comparatively soft filling without need of the boarding and uprights necessary for modern concrete, not that the architect's resources were even then exhausted. Viollet-le-Duc tells us that certain lintels of a stone-built monastery in France of the time of the Empire were made of concrete, as the native stone was not strong enough to bear the weight. The harbour of Marseilles and some of our sea-walls are built of huge stones made of concrete or mortar.

I may mention that in the time of Vitruvius the common material for buildings appears to have been sun-dried bricks. One of the aqueducts of Carthage, a drawing of which has been lent me by Mr. Alexander Graham, is built of huge blocks of mortar made of the native earth and lime.

One striking characteristic of the Romans was their impatience to occupy their buildings as soon as they had decided on having them; and this desire must have been greatly stimulated by military operations where ditches, mounds, walls, and forts, often of immense extent, had to be executed with the utmost rapidity. The Colosseum is said to have been completed in two years and nine months, and the Therme of Caracalla, including the enormous raised platform, in six years. Habits, too, learned in the camp must have been applied in Rome. In many cases barracks, theatres, amphitheatres, and baths, were wanted in the provinces, where little skill but that in the army could be found, and large bodies of unskilled labourers could be requisitioned. Timber had to be cut from neighbouring forests, and there was no time for seasoning. Besides the expense and delay, the shoring or supports for the centering must very rapidly have been useless from shrinkage and warping; the object, therefore, was to make the centering as light as possible, to do away with the shoring where practicable, and to let the green boards serve their end before they so shrunk and warped as to be useless. The observation that discovered that rubble walls could stand without bulging for 4 ft. or 5 ft. when protected by a thin skin of brickwork, and the ingenuity of making one brick go as far as four, was applied to the vaulting. One of the earliest devices was to cover the centering with a skeleton network of brick, that was perfectly rigid, as rapidly as possible, and to this end transverse rings of bricks, from 6 in. to 8 in. wide, and 2 ft. high, were turned 2 ft. from centre to centre, and in as longitudinal ties, and the horizontal courses of rubble were filled into the coffers, which were about 18 in. square (see ink-photo illustration). As the courses of rubble were shallow, they soon set, and there was, too, considerable friction longitudinally against the upright sides of the brick arches, and the coffers were dovetailed transversely. Directly the lower courses had set, the upper part was carried by it, and there was no further weight on the centering.

There is, too, another consideration. If the centres were not rigid,—and practically none of wood can be so, unless the wood is well seasoned, and of excessive strength,—its giving would crack the solid mass of rubble, and to a great extent make it unsafe. Some of the arches of the aqueducts are made with this skeleton framing of brick. When people imitate, and persuade themselves that what they imitate is perfect, no improvement can take place; but as soon as they begin to think for themselves, improvement is almost

\* Pliny's letter, Lib. 10, c. 16.



constant. The Romans thought they could do without the coffers, and so make the ribs further apart, keeping the 2-ft. tile, but putting it in the middle of the rib, so that about 8 in. projected on either side as a toothing, and this served to tie the rubble filling to the ribs. Another step was subsequently taken, which is to me utterly incomprehensible. About every 10 ft. a slice as it were of the former method was used, i.e., two ribs only, about 12 in. apart in the clear, were connected with the 2-ft. tile, but without the toothings. This may be seen in the vaults of the aisle of the Basilica of Maxentius. Its only use, as far as I can see, was to keep the wood centering from rising up in the middle, as it was loaded on the haunches,—unless a skin of rubble was first put over the centering, though I did not notice this in the ruins. The arches through the buttresses to the nave vault of this Basilica were done in coffers, as in the former cases, i.e., six-brick rings, with 2-ft. tiles connecting them for the skeleton voussiors, making up their thickness of 10 ft. At the Temple of Jupiter, at Diocletian's Palace at Spalatro, the former method was adopted, only arches were used instead of the rectangular network. A succession of arches, 8 tiers in height, were built round the dome, above the large arches at the springing, and were afterwards filled in solid, with successive rings of smaller arches in brick, and a brick spandrel-piece to each, the cap of the dome being most probably of rubble. Robert Adam only shows a plain surface above the arches. This new departure was evidently a solution of the difficulty experienced with a dome, and is even more forcibly seen in a small one, and this dome is but 43 ft. 8 in. in diameter, for in the case of ribs, where these crossed or abutted at the top, they made a solid mass, and each of the horizontal bonding-tiles had to be cut, while arches could be turned smaller and smaller. Robert Adam took no trouble to ascertain if the cap was intersected with crossing-ribs, though it is quite possible there were none; as soon as the skeleton honeycomb was done, a thin course of rubble may have been put over the cap to keep it in shape.

Since writing this, I have read M. Choisy's "Art of Building among the Byzantines," and he says this arching was done to save all centering.

A new method was hit on long before the building of the Basilica of Maxentius, certainly as early as the Pantheon. At the *Thermae* of Caracalla it is in full force for semicircular arches, the half-hemispheres of the exedrae, and the groined vaults. A course of 2-ft. tiles were laid flat on the centering, and over these another course of 8-in. tiles, and in every case the tiles of each course do not break joint with one another, but are laid in regular lines, like the squares on a chess-board, the small upper tiles, however, covering the joints of the lower large ones. It has been supposed that this inversion of the natural method was to save stuff and have only battens on the wood centres, 2 ft. from centre to centre, instead of continuous planking. The inner tile-skin was connected to the rubble by tiles here and there, built in edge-wise, that I have called tag-tiles.

Near Florence, in 1854, I saw a segmental vault so turned; I have lost my drawing, but, to the best of my recollection, it was only about 18 ft. span, and was turned with single tiles set in plaster of Paris, and there was no centering used, only turning-pieces, about 6 ft. apart from centre to centre, each tile being held in the bricklayer's hands till the joints had set; on this concrete was to be put, and a mosaic floor which had to be rammed; the haunches were stiffened by small vaults turned in the same fashion, and it was called *Volterran* vaulting. In the Roman vaulting with a tile-skin they first left out the middle tile of the upper course, i.e., there were eight instead of nine tiles to the 2 ft. square; next they only put a line of the small tiles over the transverse joints; and eventually only one 8-in. tile at the junction of the four large tiles, and, in a few cases, they trusted to a single skin without cover-tiles, as in the *Volterran* vault I mentioned.

There was one very original application of single tiles in the vault of the newel staircase to the aisle roof of the Basilica of Maxentius. Two tiles were let into the walls at the bottom, and butted at the top, so as to make a triangle; this was made in steps, 2 ft. long for the head-way (see ink-photo illustration). The question we naturally ask ourselves is this,—In large

spans, could this thin skin have supported the enormous weight of rubble without the arch being forced out of shape or the top courses being crushed? For it had nothing but its own rigidity to keep it in shape, and its own strength to resist the pressure.

#### Groined Vaults.

It is well known to the students of Roman architecture that the Romans avoided groining, when they could, by letting the intersection take place in the upright walls below the springing of the semicircular vaults; but in the case of large halls, as in the *Thermae* and vaulted basilicas, to do this was to make the halls unduly high, and consequently unduly costly; and even in Rome, the fact of the windows being below the springing of the vault left a mass of gloom that was not agreeable. At St. George's Hall, Liverpool, the vault is invisible, except on very sunny days, or when lit up at night. In the *Thermae* and vaulted basilicas, the aisles would have excluded light had not the groining permitted the opening of large windows. I merely mention this, as at present we are engaged on the construction of vaults, and not on the effects of lighting. The Romans tried to get the width of the interpenetrating vaults equal, and when the difference was slight they kept the crowns level and stilted the narrower one.

They also used this device, which may be seen in the plans of the *Thermae*, where the halls were not square, or too long to be divided into a number of equal squares. The excess at each end was made into a simple semicircular vault, and this was of some service, as piers were thus got to resist the diagonal thrust of the groin points. There are, too, cases in which the groined bay is as long, as in the end bays of the *tepidarium* of Diocletian's Baths.

The double tile centering was used in the groined vaults, as in the semicircular ones; only at the groin points, where the large tiles merely abutted, they were strengthened by the upper course at the junction, being of the 2-ft. tiles as in the lower course, only breaking joint with them, while the rest of the upper course was of 8 in. tiles. On this the diagonal ribs were formed, consisting of one centre rib and two side ones, connected with the 2-ft. tiles, only in this case the centre rib was square, and the other two were necessarily splayed, as well as the tiles connecting them, and this was done by rough cutting. In building these, one of the compound diagonal ribs was carried right over,—i.e., making a complete arch,—and the other was scribed to it on both sides, which must have involved filling in the coffer with rubble at the junction before the general rubble was laid.

In vaults of large span, the vault arch (*arc donbleau*) was used, consisting of two rings joined by the 2-ft. tile; but in small vaults this arch vault was omitted.

Eventually, where the span was inconsiderable, the Roman architects used only a single brick arch for the diagonal ribs, with the projecting toothings, as mentioned in the case of semicircular vaults.

You will have gathered from what I have said that the system of groined vaulting called Gothic, even to what may be roughly called the flying buttress, had not only been invented, but brought to perfection by the Roman architects, some ten centuries before Gothic architecture began. The merit of the Gothic architects was to make an ornamental feature of what before had been hidden in the body of the work, and, by a system of balance, a stronger material, and a greater supply of skilled labour, to dispense with much of the substance that was necessary when the material was coarse, and when dead-weight only came into play.

You must observe that in one particular the Gothic scheme was founded upon another ideal, probably originating in the scantier means at the architect's disposal,—the Roman vault was roof and ceiling in one. If terraced, it was covered with mosaic; if inclined, with tiles or metal. In the Gothic, the vault was a ceiling only, except at Milan and a few other places, and the roof was a combustible one of wood, and by its weight helped to counteract the thrust of the vaulted ceiling. The rubble filling in vaults, when the span was great, as in the *tepidarium* of Caracalla's *Thermae*, and for its solar cell, had pumice-stone for the matrix, but in those of smaller span merely tufa; and in all cases the courses of rubble were horizontal in arches, vaults, domes, or backings.

Before entering on those circular vaults we

call domes, I must say a few words about Vitruvius. He knew of burnt bricks (though he mostly calls them *tegulae*, or tiles, or *testae*, earthenware, though in the piers of the suspensae he calls them *laterculi*, or little bricks), of arches, and even of the dome of the *Laconicum*; but he speaks of all these in the most cursory way. We cannot help asking ourselves how it was when aqueducts had been built so long before that arches were so little spoken of, and why nothing is said of the methods pursued in vaulting and doming, not to speak of centering. At the very latest the dome of the Pantheon must have been done in Vitruvius's lifetime, and it cannot be supposed that all these devices suddenly sprang into existence. M. Choisy believes that all these devices were only begun in Agrippa's days. Count Nispi-Landi will have it that Lucius Cossutius Auctus built the Pantheon, and superintended the tunnel at Posilipo, which is said to be half a mile long, and to have been done in fifteen days by the aid of 100,000 slaves. Was he the architect who first started the skeleton framework? And if so, where did he get the idea from? Until the illustration of Viollet-le-Duc wrote on Roman construction, and his celebrated pupil, M. Choisy, published his "Art of Building among the Romans," I knew nothing of Roman construction. Mr. Palladio did not take the trouble of seeing how the walls were built, for in his book of 1570 he shows the brick facing of oblong bricks, and not of triangular ones, though Leoni Alberti, in his book of 1565, shows the triangular brick facing, and neither Alberti, Serlio, nor Palladio seems to have known anything of the method pursued in arches, vaults, and domes. As yet we do not know the real dates of these constructions, so we cannot follow the improvements chronologically.

The Romans seem to have found that the pressure of the rubble squeezed the web centerings of domes out of shape, so they began by putting ribs of brickwork round the dome to keep them in shape.

Although the dome of the Pantheon is only the biggest built one in the world,—I mean by this without iron ribs,—but is supposed to be the earliest Roman one of any size, I will not say this to the last, and will take the one of Minerva Medica, which Professor Middleton believes to have been built in the reign of Gallienus, 253-268 A.D., and tells us was called the *Terme di Galluccio* in the Middle Ages. It is a decagon, about 80 feet in diameter, with nine semicircular recesses, and looks very like the *laconicum* of a bath. From each interior angle at the springing of the dome above the pendentives rises a compound rib, formed of five rings connected with 2-ft. tiles; the upper part of the dome is destroyed, but at about one-third of its height from the springing, the angle rib is diminished to two bays. M. Choisy considers this to have been caused by a change of intention, but I am not so sure. No means sure of this, as it gave later stability when there was nothing but the skeleton framework. The upper story,—above the semicircular recess,—was lit by semicircular-headed windows in each bay. Taking one of the ten gussets of the dome, it was divided into three equal parts between the gusset-ribs by two single compound ribs. When these had got up to the height of the width between them, a 2-ft. semi-arch was turned. This compound rib was carried upwards to the level of the crown of the extrados of the arch. This certainly looks as if the original intention of carrying up two ribs had been abandoned, for if it were a simple skeleton, its only resisting power was the weight of the brickwork, and this was but slightly out of the upright; but it looks as if it had been filled with rubble, as a centering for the arch, and then it would have acted as weight to prevent the squeezing-out of the centering while the angle skeleton ribs were being built; and when the rubble was built the arch acted as a discharging-arch, and threw the weight of the upper part of the gusset on the haunches of the clerestory windows. It may add that the shell of the dome was horizontally bonded with the usual bond tiles.

In the quarter-sphere heads of the niches in the ground-floor one single compound rib in the middle was found sufficient, and M. Choisy shows no tile skin to these, though this was found in the half-hemispheres in the walls of the Pantheon, as well as at Caracalla's baths.

Nothing was known of the method of doming the Pantheon until the days of Piranesi. In the



Middle Ages it was supposed to have been built on an earth mould in which coins had been thrown, so that the people might afterwards carry away the earth without payment. Giambattista Piranesi (1720-1778) was Pope Benedict XIV.'s architect (1740-58), and had to restore the internal stucco of the Cupola. In his work he gives the construction of the brick skeleton for keeping the centering in shape, and preventing pressure coming on the open parts of the sub-structure. Viollet-le-Duc wrongly supposed that Piranesi saw this brick framing on the outside; but he says, "as is seen when the ancient stucco was stripped off"—i.e., the inside.

In the first place, discharging-arches were carried round at the springing to get a bearing on the solid parts (see ink-photo illustration). These arches seem to be about 6 ft. on the face; the lower third of the arch on each side was bonded; the centre-pieces of each arch had first a 2-ft. ring, and above this, and on the skewback of the bonded part, there were stone springers with the two remaining 2-ft. rings bearing on them. From the crown of each spring the ribs of the eight gussets, going nearly up to the ring of the central eye; these ribs were capped with stone, the upper part of this being played on each side, to form skewbacks for flat arches, holding up the ring of the eye till the rubble was filled in. The first line of arches before mentioned, at the springing of the cupola, did not touch at the springing, but were filled in between by a solid cambered arch in four rings. From the top of this single ring was superposed on the top of the first arches, one on each side, and supported the projecting angle of the stone skewbacks or springers, and half on these springers, and half on the backs of the first arches, sprang another semi-arch 6 ft. on face, also bonded at each springing for one-third up its length, with three rings for its centre. Between this arch and the gusset ribs there was an extra bit of ring running up a little on each side to wedge in the bottoms of the gusset ribs.

There now remain but two more brick features, first a semi-arch with no bearing, and a second ring parallel to that of the open eye, below the segmental arch, that supported the ring of the eye, and forming at the head of each gusset a "Vesica piscis." M. Choisy's solution of this part is as follows:—When the rubble was filled in to the line of the springing of the upper semi-arch, the upward pressure of the gusset-ribs imparted to the eye-ring by the segmental arches began to visibly distress the eye-ring; the architect consequently put in these semi-arches on the rubble, and by this means carried the inner ring, which thus took the part of the pressure communicated by the gusset-ribs. Both the long and the semi-circular chambers in the upper part of the wall have walls dividing them, with only a narrow doorway, so as to stiffen them where the pressure comes.

I strongly advise all the students who are French scholars to read the first part of the article "Vault," in Viollet-le-Duc's Dictionary and M. Choisy's works, for no man can be called an architect who is unable to construct, and, though iron now occupies the most important place in constructive problems, none of us can say that he may not be called upon to build in the old materials, which are but slightly affected by weather, and are so far fireproof that they can only be wantonly destroyed by fire when the building is not filled with combustible materials.

The reasons given for the skeleton framework of brick in the dome of the Pantheon are, of course, open to correction, but from the dome having stood for nineteen centuries entire we must conclude that it was wisely designed and well executed, and its very duration is a plea for a construction which may now be considered as too massive.

## APPENDIX.

Extract from M. Choisy's Letter.

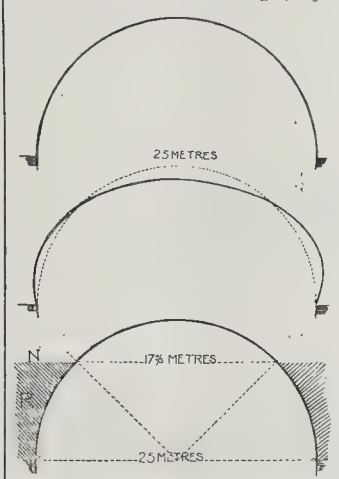
M. Auguste Choisy, the illustrious author of "The Art of Building amongst the Romans and Byzantines," who has brought to light the various expedients practised in forming the arches, vaults, and domes of these two epochs, the knowledge of which has been hidden from us for nearly two thousand years, was kind enough to send me a letter on the 2nd ult. in explanation of some points, which I think you will be pleased to hear:—

"I have only answered, after full reflection,

the questions you have done me the honour of asking on the subject of the Roman vaults.

First.—Can a vault in brick flat have sufficient strength to carry the main body of material when the span is from 20 to 25 metres?

This is how I analyse the question. I imagine a vault in brick flat constructed on centres, and I try to strike them; evidently it will get out of shape and fall; but leave the centres and execute the haunches with the filling R,—up to



the level N the filling R will only exercise on the vault in brick flat an insignificant pressure.

It is after leaving the level N that the pressure of the filling begins. Quite insignificant at first, it increases little by little in proportion to its rise, but at the same time the effective opening of the portion of the vault in brick flat is already much reduced.

At the moment that the vault in brick flat begins to act, it has no longer the semicircular profile of a wagon-headed vault of from 20 to 25 metres; it is a flat vault with a much smaller opening. It seems to me under these conditions to be strong enough.

Second.—Can arches about 3 metres from centre to centre be substituted for centering to carry the weight of the filling?

I imagine, as before, the vault constructed, and, without leaving the mortar time to set, I attempt to strike the centres. What will happen?

It seems to me that the solid part between the brick ribs\* will separate into two parts. One part, A, will form a vault, and carry its weight on to the ribs, T T. The other part, B, will detach itself, and inevitably fall.

I believe that the part B bears more or less completely on the centering, but that all the part A of the solid rests its weight upon the ribs, T T, and does not bear on the centering.

These views are expressed in my book at pages 55 and 61; but too briefly."

## THE INCLUSION OF PROVISIONAL AMOUNTS IN CONTRACTS.

At a meeting of the Institute of Builders, held at its offices, 31 and 32, Bedford-street, Strand, on the 5th inst., Mr. Thomas F. Rider in the chair, Mr. Joseph Randall (of the firm of Kirk & Randall) read a paper on the above subject, in the course of which he said:—

Papers have been so numerous upon almost every conceivable subject that one is at a loss to find anything new to discuss. It occurs to me that something may be said upon the question of provisional amounts and prime-cost items introduced so largely in quantities received by contractors for tendering purposes.

In the days when a master builder was employed for each trade, provisional amounts for structural ironwork, terra-cotta, hot-water services, bells, ornamental plastering, stoves, and chimney-pieces, and all such matters, were unknown, much longer time being given for the

\* See "Sketch from M. A. Choisy" on one of our ink-photo illustrations this week.

carrying out of the work. But in the present age of rapid building, time is usually made the essence of the contract, and buildings are required to be erected in as many months as formerly years were allowed. Builders have now to sign stringent contracts containing heavy penalties for non-completion to time. It therefore becomes a very serious matter if they are not allowed the entire control of the works for which they are made responsible; and the introduction of so many provisional amounts does not give the contractor that control to which he is entitled, because of the entry of so many specialists, who all think they should be allowed to carry out their portion of the work when and as they please, and without regard to the requirements of the contractor.

For instance, a sum is specified in the bill of quantities for constructional ironwork, but no detail is given beyond the builder being required to unload and fix so many tons of ironwork. The price has been settled by the architect, and the builder has simply to give the selected person an order in writing so as to relieve the architect from monetary liability. This selected person is often most independent; indeed, were it not for the fact that he looks to the builder for payment, he could do without him altogether. He will, to a certain extent, do the work only when he pleases, causing delay in the completion of the building, and consequent loss to the contractor.

The reason for architects adopting this system is that they do not receive the rudimentary education of an engineer, and therefore rely on the ironwork specialist to make the drawings for them. These should be made in the architect's office, so that builders, when tendering, might be in a position to see more fully the nature, description, and difficulties of the work to be undertaken. If this were done, and quantities of the ironwork taken out by the surveyor, there would be no need for making this work provisional, and the responsibility would then rest with the contractor to carry out his contract in a manner that would be most beneficial to all concerned.

It seems most unreasonable that the contractor should be held responsible, not only for giving the specialist accurate dimensions, but for the quality of the work, and time for completion as well, although his control is limited.

If these provisions are to be continued, the persons carrying out sub-contracts should be bound under conditions as regards penalties, time, system of execution, and mode of payment precisely similar to those under which the principal contractor is bound; and if the completion of the building is delayed by any default of the sub-contractors, the loss sustained should be borne by those in default, and a clause should be introduced in all contracts making the sub-contractors liable directly to the employer.

In cases of an urgent character, provisional amounts may be inevitable; and where this is so, the architect should make an agreement with an ironwork firm on the lines above indicated, stipulating particularly the mode of progress and time of delivery, which should in all cases be best calculated to enable the whole of the work to proceed in proper order, and not, as some ironwork contractors appear to think, in such order and at such time as best suits their convenience. Indeed, sometimes so erratic are the deliveries of ironwork, that it would appear as if the builder intended to commence at the roof and work downwards.

The contractor has no claims upon the client, and cannot, as a rule, recover anything from the defaulting party; but, on the other hand, he has to suffer not only the pecuniary loss, but the stigma of being behind time with his contract. This might be prevented if architects made their own ironwork details, the builders being held responsible for carrying out this portion of the work.

Now as to terra-cotta forming a provisional item. The architect selects a particular firm to execute the terra-cotta, and arranges with them the price; the builder, after signing the contract, generally finds the terra-cotta manufacturer requires longer time to deliver the terra-cotta than is given to execute the whole work.

Instances could be given where from one cause or another terra-cotta that should have been delivered in six months did not arrive till twelve or eighteen months afterwards, the result being loss to the builder and intense dissatisfaction all round.

The case of terra-cotta is to some extent



complicated by the fact that working details to a shrinkage scale have to be drawn before the work can be put in hand, different makers having varying scales to suit their particular material; but this should be no excuse for the details not being at hand immediately the contract is signed. These details are generally the sole cause of trouble and delay. Some architects prefer to make their own; others say to the manufacturer, "Here are the drawings. You know better than I do what the nature of your material is; make the working drawings yourself, and submit for my approval." In some cases this course can be adopted, and where it can it is a common-sense thing to do. Builders should with caution undertake any contract where terra-cotta is largely used, unless ample time is given for its manufacture.

The builder in making his arrangements endeavours to limit the terra-cotta maker to time, mode of delivery, and all other stipulations necessary for carrying out the terms of the contract; but, unless he has all details ready, he is met with the remark "We can guarantee you no time of delivery until we are supplied with the whole of the details."

On whatever grounds architects may defend the non-preparation of all detail drawings before the contract is signed, it is absolutely imperative in the case of terra-cotta work that they should be ready.

For all such special work as terra-cotta the quantities should be taken out by the surveyor and included in the bills of quantities in the ordinary manner; and if the architect wishes for a particular terra-cotta manufacturer, and to personally make the agreement with him, he should bind him as to time and mode of delivery, and the time for completion, for a sum agreed, such times and dates in all cases to allow a fair margin of time for the builder to follow on with the completing trades. The terra-cotta manufacturer should be made party to the principal contract, and should sign the same as accepting all responsibility for his own work, and all drawings and details should be handed over to him by the architect at the signing of the contract.

The foregoing assumes that the architect is determined to make the terra-cotta a provisional amount, but the best course, after all, is to treat it the same as he would treat stonework—let the builder put his own price to it; let the architect, if he likes, have a sample for the builders to see when tendering, and let them make their own arrangements with the manufacturer direct; it is the shortest, simplest, and best method, and the one most calculated to work smoothly, and thus avoid the delay, unpleasantness, and extra expense often consequent upon the architect specifying one particular firm.

Should the architects themselves arrange with the manufacturer direct, builders should be not only exempt from the responsibility as to time or penalty, but the terra-cotta maker should be bound by the architect to make good any loss the builder sustains through his default.

After many years experience, I can only recollect one instance where the terra-cotta was supplied to the stipulated time.

With regard to gas, hot-water, bells, &c., for which generally provisional sums are included, and in most cases a firm or firms named to carry out the work, other sources of annoyance and delay occur, as generally the gasfitter chooses to do the work when it suits his own convenience, and when, perhaps, the plastering is started and the floors laid, causing endless cutting away and making good, and generally destroying the appearance of the other part of the work, as well as rendering it necessary to go over it a second, or even a third time.

If there are doubts about the position of the gas-pipes when the tenders are invited, approximate lengths of pipes should be given so as to form a schedule, leaving it to the builder to have the pipe-work arranged to suit the proper progression of the work, and it would only be necessary for the architect to indicate where the points should be, in which case the builder could fairly be held responsible for any negligence or defect that might arise.

The principles of gas-lighting are so well known that architects should be able to give sufficient detail in their specifications to enable the pipes to be laid without the aid of a specialist, and until architects clearly indicate in their specifications the position and description of the warming, lighting, and other similar work, surveyors cannot be held responsible for not taking out the quantities.

With regard to bells, it frequently happens that this work is done by another sub-contractor, who as a rule follows the course most suitable to himself, without regard to the exigencies of the builder. Whether it delays or destroys his work, or whether he has to make additional outlay for taking up boards or cutting away, this is of no moment to the bellhanger; the cutting away and making good is not included in his contract, and he cares not who pays for it—that is a matter which does not concern him.

Architects consider that they clear themselves and their clients of all responsibility for cutting away and making good after all these specialists, and for all provisions of every sort and kind, by the brief clause, "include for cutting away and making good after all trades," but, I ask, how is it possible for the builder to estimate the cost of such work when no particulars whatever (unless a lump sum can be called such) are given to guide him? Such work should be included in the amount provided, and should in all cases be charged in day account. Further, although these provisional sums have been arranged directly with the architect, the builder is held responsible for all defects and shortcomings on the part of the person selected by the architect, and this is neither fair nor reasonable.

To properly arrange and clearly specify the heating arrangements and hot-water supply is surely not a matter of difficulty to an architect of experience, nor is there any need for making such work provisional; certainly not in the interests of the client. In fact, there should be no more difficulty in describing this work than in fully detailing the internal plumber's work, and supplying the quantities to tender upon. Work of this character, if clearly defined, could then be left for the builder to carry out on his own responsibility, and if he is not equal to this he is not fit to be employed.

There are many other provisional items included in contracts that it would be easy to avoid if a proper description were given to enable the surveyor to take out the quantities the same as he does for other parts of the work, leaving the builder free both as to the price at which he estimates the value of the work, and the manner and time of doing it. And he would then be able to organise the various branches so that trade may follow trade in a systematic manner, and thus avoid the trouble, anxiety, loss and expense he otherwise inevitably incurs, and for which he receives no recompense.

Another view of the subject meriting a passing notice is as to certain goods being specified to be obtained from certain persons, who, as a rule, when they know they are specified, obtain an advantage in price; in fact, it is an inducement for merchants to charge a higher rate, and is therefore unfair to both client and builder.

This practice of specifying particular persons, which gives them what is practically a monopoly, could, and should, be avoided by adding the words "or other approved firm," thereby giving the builder some latitude, while preventing unfair advantage being taken.

There are items such as stoves, chimney-pieces, and ironmongery, which are specified to be selected at prime-cost prices. Provisions of this description may, to a certain extent, be necessary for the client's or architect's convenience in selection, but here the builder is met with a clause in the specification such as, "All values quoted as prime-cost are exclusive of profit, packing, carriage, and fixing, and any other customary charges, for which the contractor must allow, and to be so deducted in case of omission." It is manifest that in many cases the builder is unable to make a proper allowance to cover such contingencies, when he is unable to know where the architect is likely to select these goods, and what the maker's charges may be for packing, carriage, and other incidental items, which are made after the architect has obtained the lowest possible prices. If the builder makes any demur, he is told that he should have made proper allowance in his estimate; whereas, in most cases it is impossible to accurately, or even approximately, estimate these additional charges.

Another ambiguous item is frequently met with, for instance, tile pavings at a certain prime cost at manufactory. The builder is to include for carriage, profit, packages, and laying; but it frequently happens that the builder may estimate 2s. 6d. or thereabouts for laying what he may, from the sum provided, naturally con-

sider a plain paving, whereas the architect may select an elaborate paving in small pieces, the cost of laying which may be three or four times what the builder anticipated. The proper rule in these and similar cases is that the prime cost price should include all charges as well as laying or fixing, leaving the builder to put in his own profit.

Although the prevailing method of introducing considerably more provisional sums in contracts than are absolutely necessary may save the architect much trouble, it should be the architect's duty to his client, and greatly to the builder's advantage, if such details were given that he might apply his own price and be left to carry out the work.

At present these provisional amounts average from 25 to 40 per cent. of the contract amount, and in many cases the builder is simply left with the excavation, concrete, and brickwork, mason's work, carpenter and joiner's work, and the painting, nearly all the other work being set forth to be done by other tradesmen. If builders are to be held strictly to contracts, they should be permitted to carry out the whole of the work, and to enable this to be done, they should have a voice in selecting the person to carry out the provisions, so as to ensure the builders having proper control. And further, where sub-contractors are directed, upon the instructions of the architect, to carry out portions of a contract, and fail to fulfil their undertaking, the client should be held responsible to the builder for such default.

#### OBITUARY.

**Death of Captain Ericsson.**—The Nestor of the profession of civil engineering died on March 8 at New York, aged 86. John Ericsson was born on July 31, 1803, at Langbanshyttan, Wermland, Sweden, where his father owned some mines. He entered the Swedish Army in 1822 as a lieutenant of Engineers, and rose to the rank of captain, but left the service, and devoted himself to civil engineering. In 1827, he went to England, and in 1829 took part in the engine competition in which George Stephenson's locomotive, "Rocket," obtained the first prize. Captain Ericsson's engine, "Novelty," being second. In 1833 he first brought to public notice his screw-propeller. In 1837 he constructed the *Atlantic P. Opden*, the first vessel worked by the screw-propeller. Finding that he could get no support for his propeller from the English Admiralty, he left for America, and during the next few years had the satisfaction of seeing the screw-propeller adopted by the navies of the world. The first war vessel he built in America was the *Princeton*, which was also the first steamship which had her machinery protected from shot by being placed below the water-line. The story of the *Monitor*, which made such short work of the formidable Confederate vessel, the *Merrimack*, and which he constructed in the short space of three months, is too well known to need more than a reference. During the later years of his life, Ericsson was engaged in perfecting his system of submarine torpedo-boat, the outcome being the *Destroyer*. It is a remarkable illustration of the genius of the man that he never saw that vessel, working, and giving his directions by drawings. The latest invention of the deceased was his solar engine or sun-motor, in which the rays of the sun are directly utilised in generating steam for operating engines. He also gave to the world the steam fire-engine, and his other inventions are numerous.

#### Greek Mouldings Illustration Fund.

Mr. Penrose has received the following further subscriptions towards this fund:—

|                          |    |   |
|--------------------------|----|---|
| Mr. R. T. Batsford ..... | £1 | 1 |
| Mr. H. Stammers .....    | 2  | 2 |
| Mr. Arthur Cates .....   | 2  | 2 |

We may call the attention of our readers to a letter on the subject from Mr. Penrose, in another column.

**Sewage Purification.**—On Wednesday last Mr. Charles H. Beloe, M.Inst.C.E., delivered a lecture at the School of Military Engineering at Chatham, to the officers of the Royal Engineers, on the purification of water and sewage by the magnetic spongy carbon process introduced by the International Water and Sewage Purification Company, Limited, of London. The lecture was illustrated by diagrams and samples of the materials used, and of the results obtained by this process.





Hall at Lower Brandon, James River, Virginia.—Eighteenth Century.

#### HALL AT LOWER BRANDON, VIRGINIA.

THIS is an interior from one of what are called the "Old Colonial" houses of the United States; English eighteenth-century domestic architecture, repeated on American soil.

#### ANCIENT SCULPTURE IN BRONZE: RELIEFS.

MR. A. S. MURRAY, Keeper of the Greek and Roman Antiquities in the British Museum, delivered his second\* lecture on "Ancient Sculpture in Bronze" to the students of the Royal Academy on the 21st ult. This lecture was devoted to the subject of reliefs.

The lecturer, at the outset, said that the Greeks, like many people nowadays, were a little vague as to the nature of bronze: they made no clear distinction between bronze and copper, no word served for both, and a consequence of that was that when we tried to trace back to

its beginning in Greece the process of mixing copper with a small alloy of tin and some other minute ingredients so as to produce bronze, we were stopped at the threshold by that ambiguous word *χαλκός*. There was every reason to believe that bronze, in the true sense, was known as far back as the time of Homer, but there was no positive proof, for the reason just mentioned. Our information as to the composition of ancient bronzes was derived from analyses that had been made in modern times. Although Pliny gave us certain statements (xxxiv., 6-9), they were useless when he mentioned details, and only amusing where he reported that the alloy which made the Corinthian bronze so famous had been discovered at the sack of Corinth by the Romans under Mummius, when vessels of gold, silver, and bronze melted together in the conflagration, and produced a golden bronze. That was in 146 B.C., but the charms of the gold-like Corinthian bronze had been known long before. Nevertheless, the story, though of late origin, might have been based on a tradition as to the use of gold as an alloy of bronze, because from

several specimens of ancient bronzes that had been analysed, it had been found that gold and silver were actually employed. An archaic fibula yielded 7 per cent. of gold, 20 per cent. of silver, and 73 per cent. of copper. A peculiarity of bronze which was early discovered was that it readily allowed itself to be beaten. The more it was beaten, the more useful it became. Bronze hammered out into thin plates was of endless utility. Primitive people, who wanted a bronze vase and could not yet make one all of one piece, took several thin plates, bent them, cut them, and fastened them together with rivets or nails, and so produced the required vase. With such thin plates of bronze they decorated the walls of their palaces, the tombs of illustrious persons, their temples, and their household furniture. When the bronze had been beaten out into long thin slips or bands, the next step was to enrich those bands with reliefs. The usual process seemed to have been to hammer the metal down into a mould of some hard substance. There was in the British Museum an archaic bronze vase on which was

\* For illustrated report of the first lecture, on "Incised designs," see *Builder*, p. 145, ante.



a long row of figures of Medusa, each of which had been beaten out from one and the same mould. In that instance, the whole of the work was done by beating down from the back. Nor were the outlines revised and corrected by incised lines, as was often the case in very early art. The best and one of the oldest representations of the process was to be seen in the bronze plates which had adorned a gate erected at a place called Balawat, by Shalmaneser II., a King of Assyria, in the ninth century B.C. These bronze plates were now to be seen in the British Museum. They had been fastened on with nails to a background of wood in long parallel bands. The object of the artist was to commemorate a long series of victories and conquests by Shalmaneser, and to students of ancient art these reliefs were interesting because they afforded evidence that the idea of working in relief originated in the experience that bronze could only be beaten up to a certain extent, equivalent to what we now called "bas-relief." There was no great attraction in these Balawat reliefs from an artistic point of view, but they were of much historical interest in regard to the position which they occupied with reference to the subsequent art of Greece. In passing from these works of the Assyrians to those of Greece, we must not forget the intermediate stage of the Phœnicians, especially the Phœnicians who were settled in the Island of Cyprus from Assyria to Cyprus was an easy step about 700 B.C. At that date the Assyrian power was predominant in the island. Cyprus, with its rich copper-mines, and its skill in bronze-work, was a possession which the Assyrians fought long and hard to retain. But what interested us in the matter was the direct influence which the Assyrian art of the seventh century B.C. exercised on the Phœnician workmen in Cyprus. Of late years much evidence had been obtained from excavations,—evidence which always went to show that the Phœnicians had been constantly indebted to the Assyrians for conceptions and designs, for what might be called the motive-power of their art. They brought the technical skill themselves, and were industrious to the highest degree in metal-working. They commanded the markets for articles in bronze, and one of these markets was Greece. That was the state of things in the seventh century B.C. It should be remembered to how great an extent bronze must have entered into the circumstances of daily life among the Greeks of that date. To say nothing of the legendary palaces of Menelaos and Alcinoos, with their walls glittering in bronze, the interior of a house described by the poet Hipponax in the sixth century B.C. was spoken of as hung all round with shining bronze armour, weapons, and vases. Tombs were incomplete without the same: one had only to recall the number of bronze swords and spears from the tombs of Mycenæ and Alyseos. Temples were store-houses of trophies in bronze. In the decoration of armour, furniture, vases, tripods, and other things, there were continual opportunities for the use of bronze sculpture in relief. Compared with the extent of its use, however, we had not much actual remains of the kind from Greece. Bronze was too useful to the conquerors of Greece, and its only safety was in the tombs, and not always even there. Houses and their contents had vanished, so that we scarcely knew what an ancient Greek house was like. Temples had been overthrown and stripped, and public buildings of every kind had been reduced to their foundations, if even they had been preserved so far in all cases. But it sometimes happened that an insignificant fragment, when looked at in the light of some passage in an ancient author, revealed the general character of an artist who had been famous in the early times of Greek art. In that manner, though the artistic remains were meagre and the literary records not very extensive, we could nevertheless manage to obtain a reasonable conception of the skill and activity of the early artists of Greece, especially in the matter of bronze reliefs. But we must take the Etruscans also into account. To illustrate the ordinary Etruscan work of about 600 B.C. we had the reliefs attached to a bronze bust, now in the British Museum, found in a tomb at Vulci with many other antiquities, but in particular with a porcelain sarcophagus bearing the name of the Egyptian King Psammetichos I., who died in 612 B.C., the whole contents of the tomb taken together pointing to the end of the seventh century B.C., but indicating no intercourse with Corinth or any other part of Greece proper; they indicated rather an inter-

course with the Greek settlers in Egypt, to whom Psammetichos owed so much. The bust, therefore, might be taken roundly at 600 B.C. and might be regarded as an average piece of work. Of course, much was not to be expected at that time, when as yet the mere technical processes of working in bronze were only being learned. Casting was unknown, as could be seen from the bust itself, which was made up of a number of plates beaten out into the required forms, and fastened together with small nails. If there had been before then some experience in making reliefs, that experience had been checked and controlled by the designs that were being daily imported from abroad. The Etruscan workman was compelled by fashion to go on copying the foreign designs that found favour with his countrymen. It was extremely unfortunate for him, because there was plenty of evidence, even in his copying, that he possessed the power of imparting a strong if sometimes rude realisation to his designs. The reliefs on the Etruscan bust referred to, consisting of rows of animals and chariots, might not be beautiful or attractive, but from their well-ascertained date they might be useful in a humble way in tracing the connexion between the long bands of Assyrian reliefs from Balawat, and the first efforts of the Greeks and Etruscans to do something of the same kind for themselves. The lecturer said he referred to the reliefs on the bust because they were most easily accessible, but a number of fragments nearly similar in style had been found at Olympia. These, however, would hardly have served his purpose better, which was to show what was being done by ordinary workmen at a time when we had records of works of a similar kind by known sculptors, i.e., about 600 B.C. On the Acropolis of Sparta there was to be seen, as late as the second century A.D., a temple to Athene, containing a bronze statue of her, and having, as was generally understood, its inner walls plated with bronze. The statue was by Gitiadas, a local sculptor, who was also known as a poet. By him also were a number of subjects in relief, which it was often supposed were distributed on the plates of bronze that encircled the walls, but, unfortunately, the description given by Pausanias was very meagre. Another sculptor celebrated for his works in relief about the beginning of the sixth century B.C. was Bathylos, who made the throne of Apollo at Amyclæ. We should find it a difficult journey now from Magnesia in Asia Minor to Amyclæ in Greece, but Bathylos made that journey, taking with him his workmen and assistants. The lecturer said he did not mention that as being anything unusual, because nothing was more common than to find Greek artists executing extensive works far away from their homes. He referred to it only as a contrast to the great Italian schools, which were often localised as if communication with the outer world hardly existed. Bathylos arrived with his workmen, and when the task was nearly completed, means were taken to perpetuate the personal appearance of these same workmen, under the form of a chorus on the uppermost band of reliefs on the throne. That was an ancient manner of celebrating the completion of a great work. It answered to our public dinners, with the difference that the Magnesian workmen and assistants were no worse the next day. During the sixth century B.C., as far as we could judge, there was not much done in the way of reliefs in bronze. That was an age of colour. Sculpture in marble, fresco painting, and vase painting had started on a new life. Even the sculpture in marble was brightly coloured. Reliefs in bronze could not compete in the taste of the day with mural paintings or the innumerable painted vases, and so, while these arts were making great strides, and winning public favour on all hands, reliefs in bronze were in a great measure set aside. During the fifth century B.C. the arts of Greece were at their highest, but of that period we had nothing left to us in the shape of bronze reliefs. Very possibly the sculptors avoided them. Still, it must be assumed that the art had not been lost sight of, because in the next century we found the art in full operation, with what appeared to be very distinct traces of the large ideal manner of the past age. The relief on the outside of a bronze mirror case lately acquired by the Museum (which was referred to in the last lecture) consists of a group representing a love scene of some kind,—possibly it repre-

sented the story of Phædra and her love for her stepson, Hippolytos. The composition of the group had no trace in it of the formalistic balance, and responson of one figure to another which characterised archaic art, still less the bending, stooping, and contorting of the figure, to adapt them to a circular surface. It was difficult to describe its beauties except by appealing to the largeness of style in its forms, the excellent rendering of the draperies, and the conception of Eros as an accessor figure in the design. Passing over a number of bronzes of this class in the British Museum, the lecturer noticed the bronze of Siris, the name which for many years had attached to the bronze reliefs said to have been found near the River Siris, in Southern Italy, in 1820, and acquired by a quasi-public subscription in 1833. Each of the two groups represented the same subject, a Greek overpowering an Amazon in battle. Of these bronzes Thorwaldsen said that "they afforded the strongest possible proof of this truth, that the grandiose does not consist in mass, since these diminutive works are true great, while many of the modern colossal figures are, notwithstanding their dimensions, petty and mean." From a technical point of view, these bronzes were no less than marvellous as examples of *repoussé* work. The quality of the bronze must have been originally finer beyond all praise or comparison to admit of being hammered up to the extraordinary extent which it reached in the chests and faces of the Greeks. If they were not actually by Lykippus they might fairly be claimed as being largely influenced by his manner.

We hold over until next week our report of Mr. Murray's third and concluding lecture.

## Illustrations.

### NOTRE DAME, PARIS.

THIS is a view of Notre Dame by Mr. C. E. Mallows, showing it as it may have appeared with the spires which are now wanting.

The spires are restored after a plate of Viollet-le-Duc's lectures.

### PITCHFORD HALL.

THIS very curious and interesting example of the half-timbered houses of the time of Henry VIII. is situated in the Hundred of Condover, and about six miles south of Shrewsbury.

The earliest possessors of Pitchford of whom we find mention were a family who derived their name from the place; whom one Ralph de Pitchford, says Camden "behaved himself so valiantly at the siege of Bridgnorth, that King Henry I. gave him Little Brug near it, to hold by the service of finding fire-wood for the Great Chamber of the castle of Brug, or Bruggnort, against the coming of his sovereign lord the King."

The hall is now the property and residence of Colonel Cotes, to whom it came through his grandfather, the Earl of Liverpool, from the Ottley family, who had the estate for nearly four centuries. William Ottley, Esq., was high sheriff for the County of Salop in the 15th of Henry VII., and again in the 5th of Henry VIII., in whose reign the present hall is supposed to have been built.

Various alterations have been made with the object of restoring some parts of the original arrangement, and making existing and comparatively modern work more in harmony with the old. Some of the rooms have been panelled throughout in oak from the designs and under the direction of Messrs. Williams, West, and Slade.

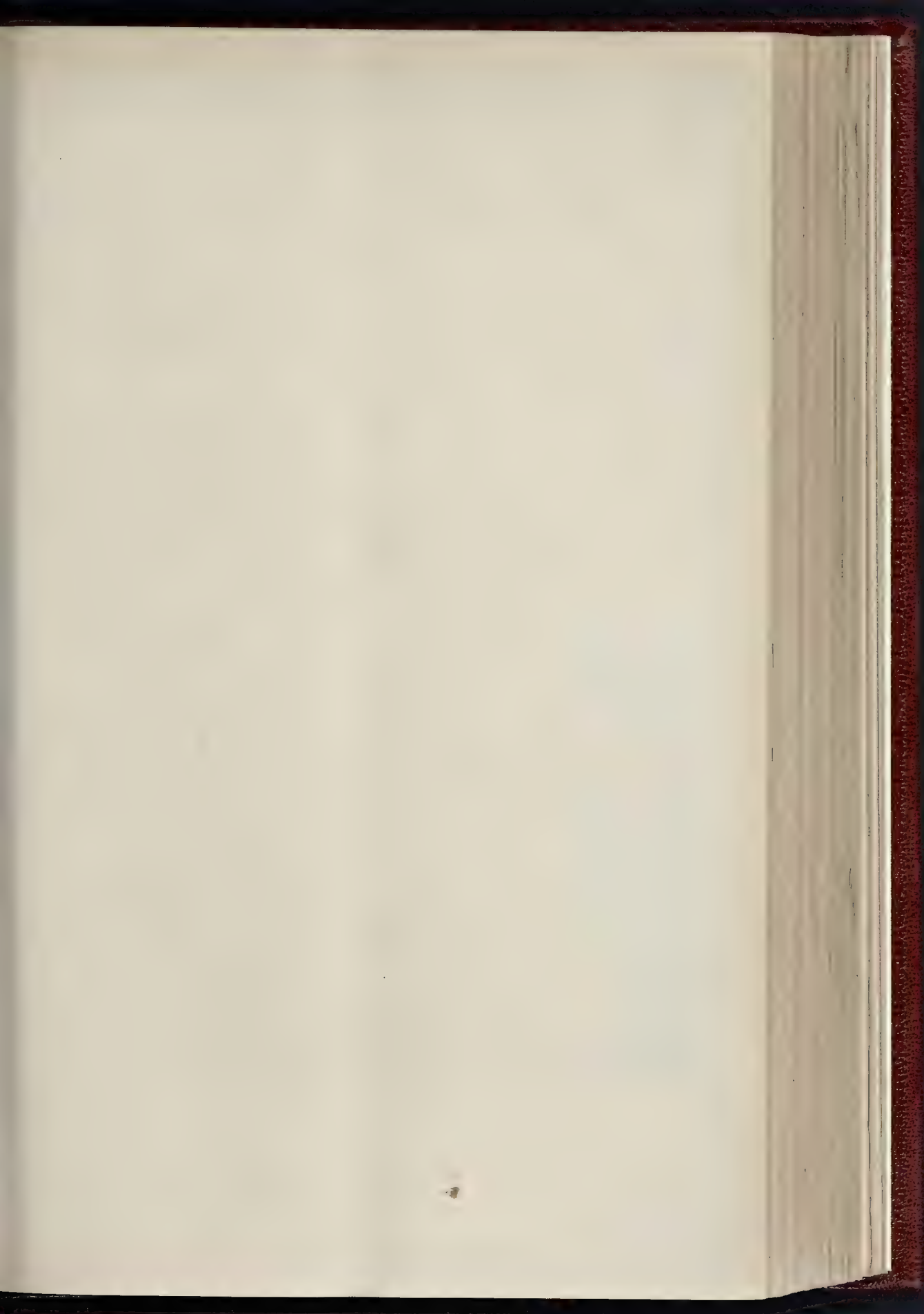
### DETAILS OF ROMAN CONSTRUCTION.

The two pages of details of Roman construction contain reproductions of several of the diagrams used by Professor Aitchison at the Royal Academy, in his recent course of lectures at the Royal Academy. We publish the sixth and last of these lectures to-day, and in it and the preceding lectures will be found references to the diagrams now given.

### ROMAN MOSAIC DECORATION.

THESE illustrations are from the diagrams that Professor Aitchison's lectures on Roman architecture. The upper one, as noted on the plate







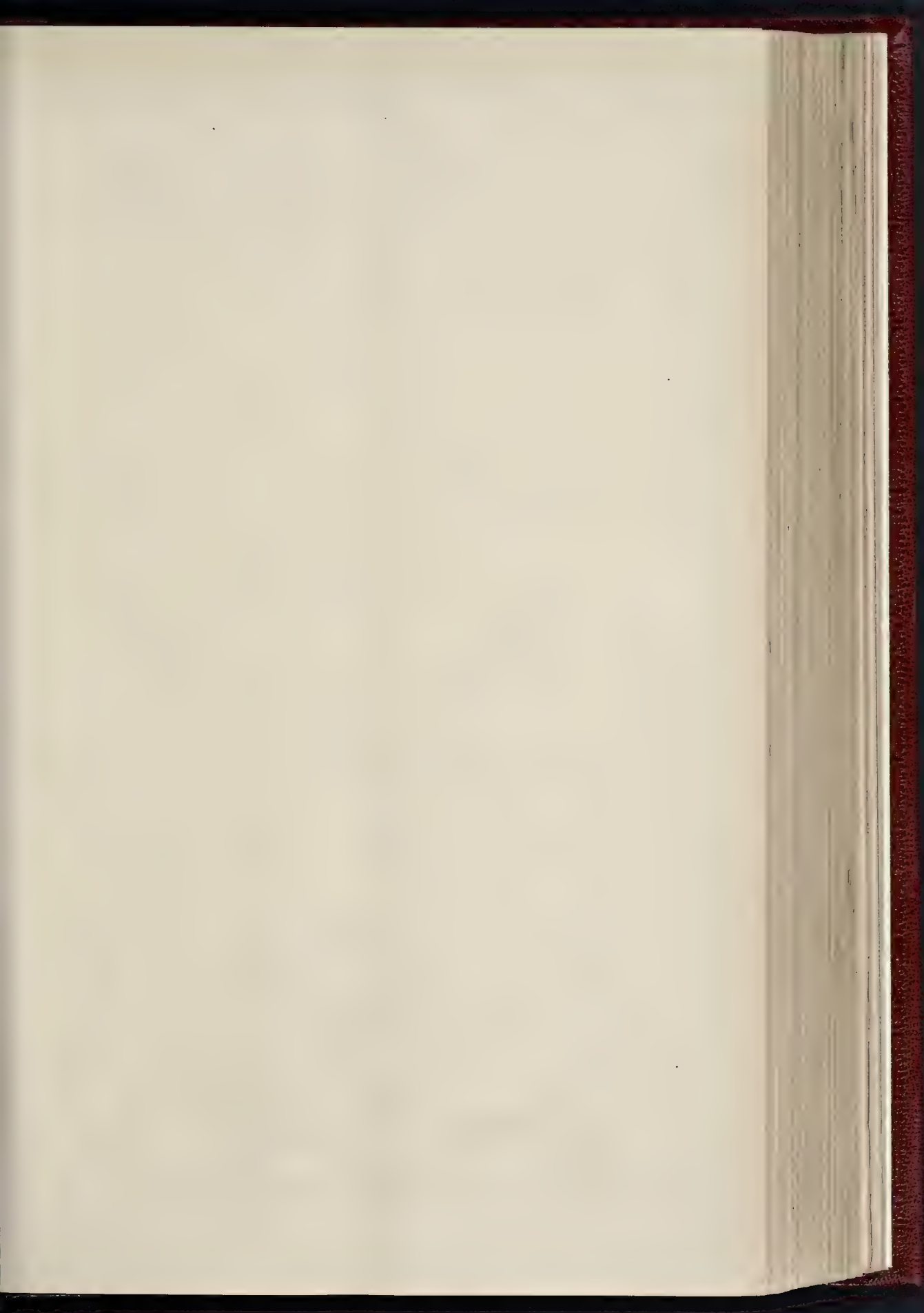
PITCHFORD HALL, SHREWSBURY.—WITH MO











## -HADRIAN'S-VILLA-

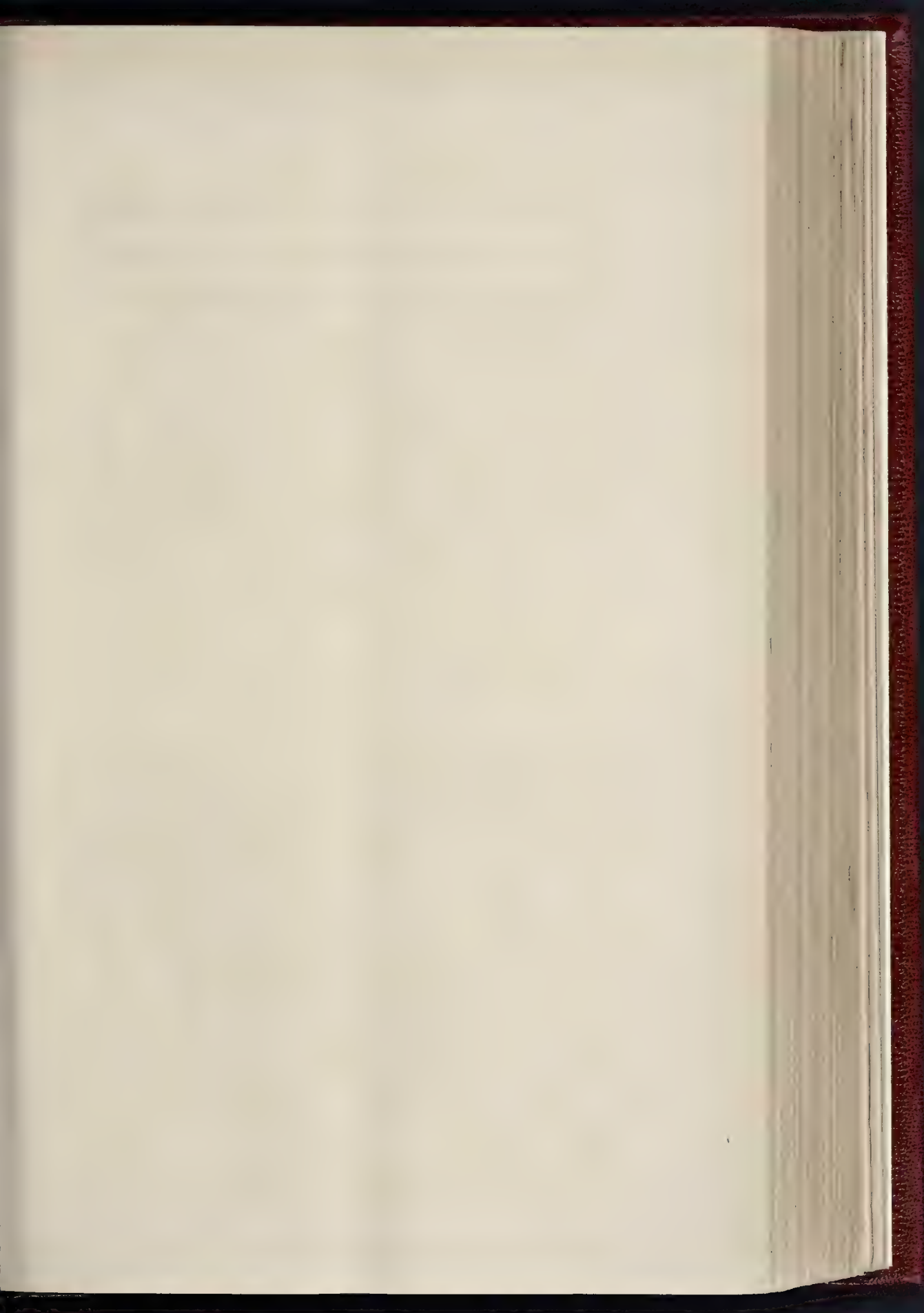


NEW PHOTO SPREADS AND 2 PARTS. SALE IN ALL OF LONDON & C.

ROMAN MOSAIC DECORATION.

DIAGRAMS IN ILLUSTRATION OF PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES.

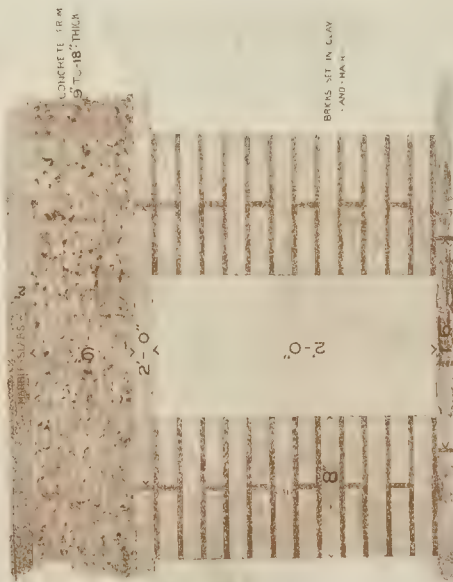




# BATHS OF CARACALLA [FULL SIZE]



## SECTION OF SUSPENSURA. FROM VITRUVIUS



BRICK-RIB OF ROMAN VAULT



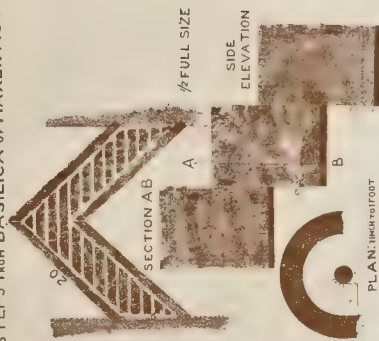
ROMAN ARCH BACK ELEVATION



RUBBLE - WALL FACED WITH BRICK  
SHOWING BOND-COURSES  
[ISOMETRIC VIEW]



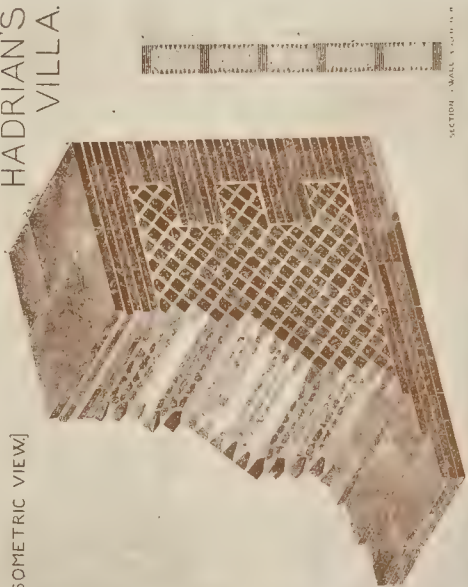
STEPS FROM BASILICA OF MAXENTIUS



FRAMEWORK OF DOME OF PANTHEON  
ACCORDING TO PIRANESI



WALL OF OPUS RETICULATUM AT  
HADRIAN'S VILLA.  
[ISOMETRIC VIEW]



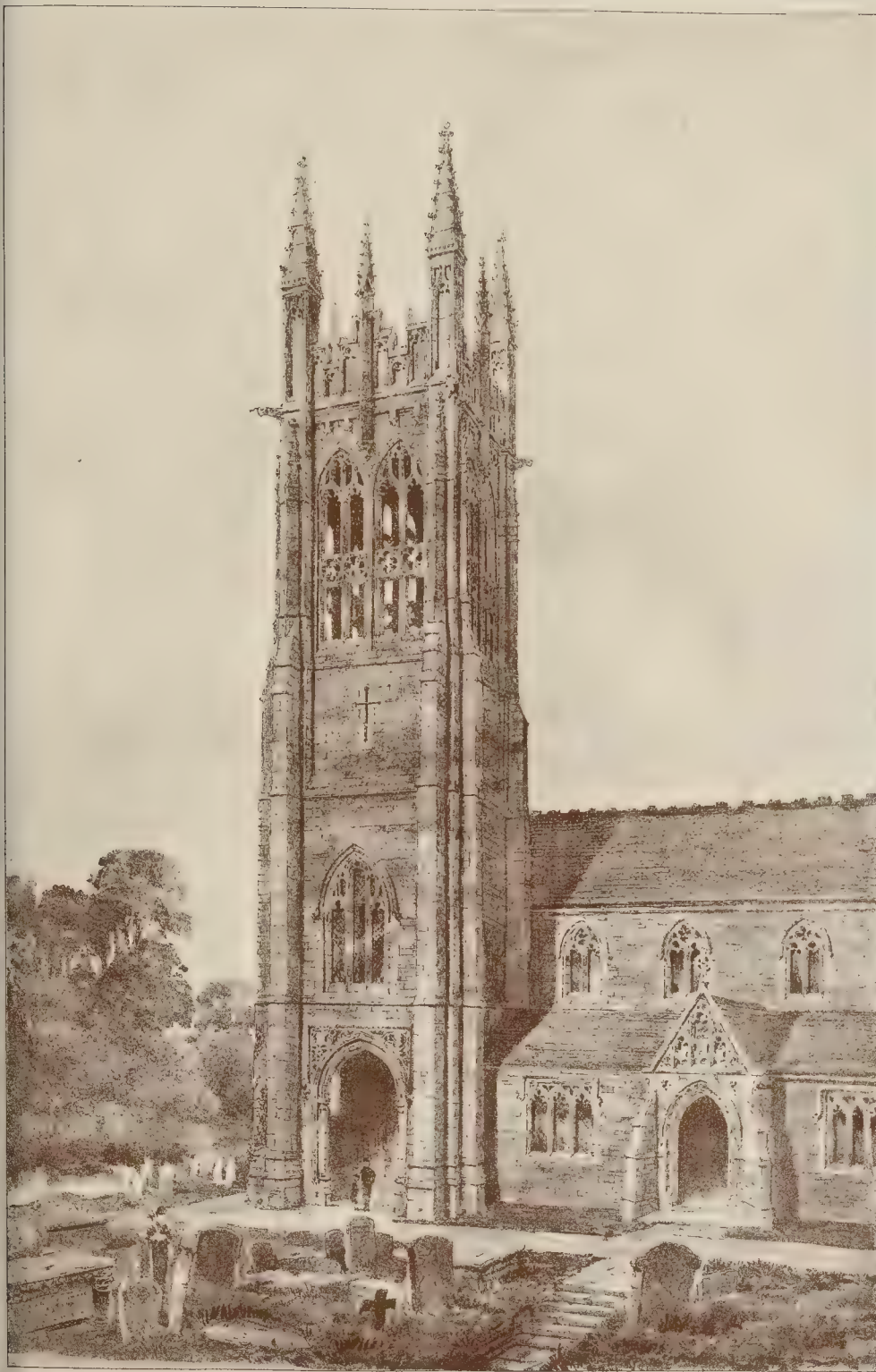
SKETCH FROM MACHOISY.



DETAILS OF ROMAN CONSTRUCTION.  
DIAGRAMS IN ILLUSTRATION OF PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES.



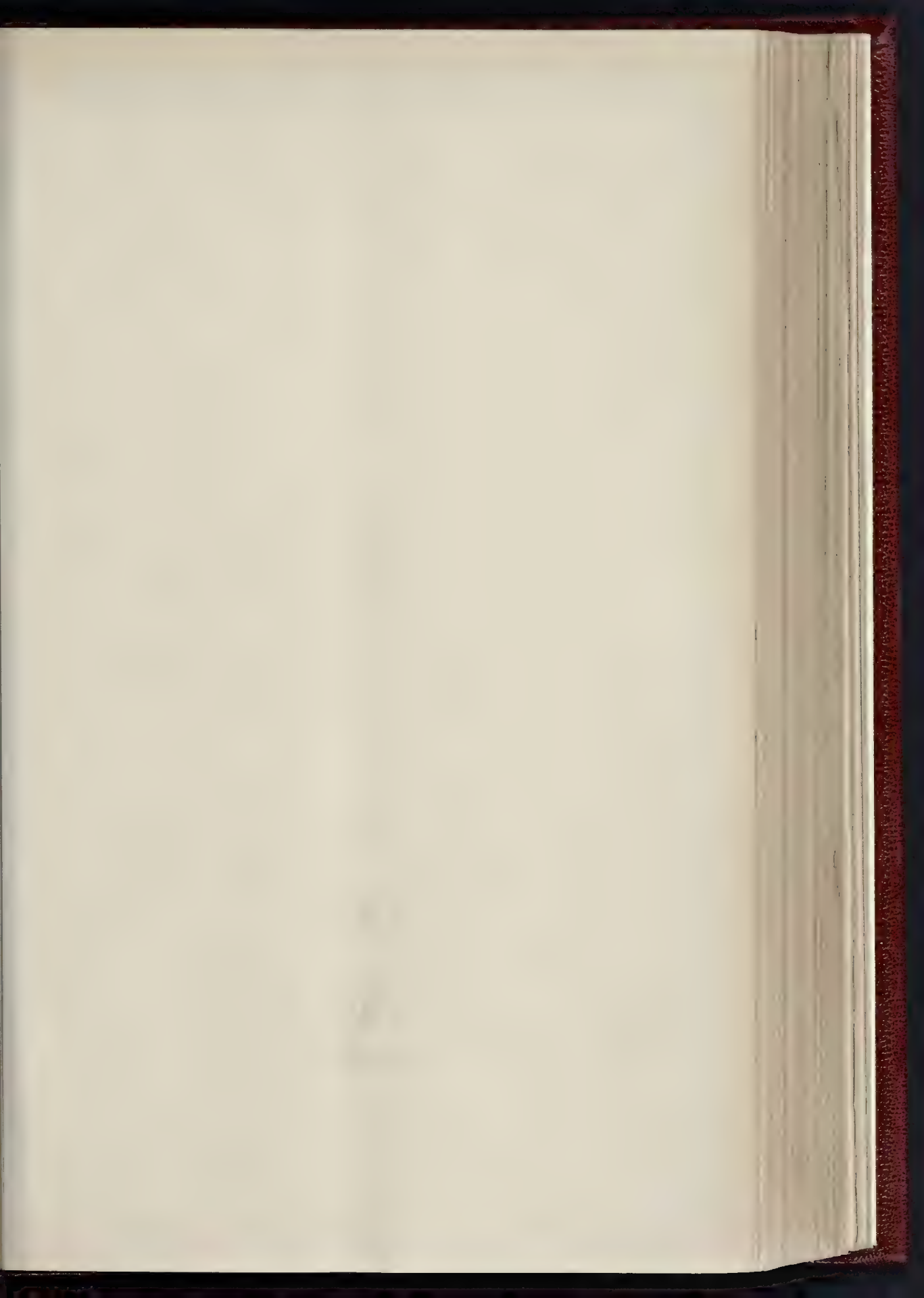




NEW TOWER OF THE CHURCH OF ST. PATRICK, COLERAINE.—MR. THOS. DREW, R.H.A., ARCHT<sup>ECT</sup>.



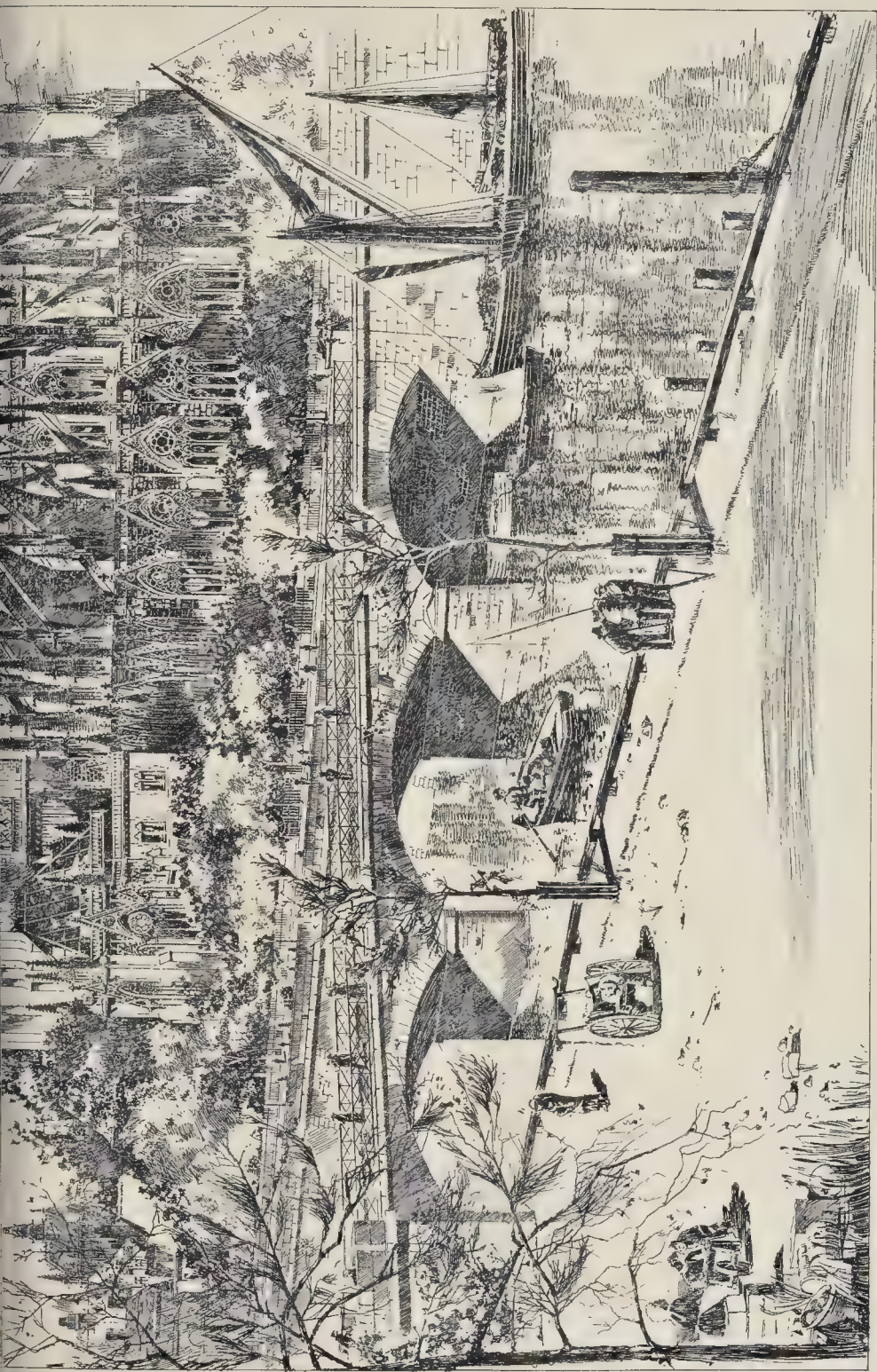




THE BUILDER. MARCH 16, 1889.







NOTRE DAME, PARIS, WITH SPIRES RESTORED AFTER VIOLET LE-DUC.—FROM A DRAWING BY MR. C. E. MALLOWS.





from Hadrian's Villa; the lower one is from the pavement in the peristyle of the Gymnasium in the Thermae of Caracalla.

#### TOWER OF ST. PATRICK, COLERAINE.

The present church at Coleraine was built in 1714, but the existence of a church on the site dates from an ancient period. It is supposed that this was done by repairing or rebuilding the walls on a part of the old foundation, and putting over them a substantial and massive roof of oak, part of which remained in fair condition until taken down last year. Only so much of the existing walls and foundations were then utilised as would meet the requirements of the scanty inhabitants of the town, and old foundations still remain extending to the full breadth of the church for some 40 ft. beyond the east wall of the building then erected. In the year 1719 a tower, surmounted by a wooden spire, which was subsequently struck by lightning and removed, was built by the Irish Society. Other additions were from time to time made to the building thus erected. A south transept was added by the Corporation in 1744; a south aisle and a small chancel in 1851; a north transept in 1862; and a vestry-room, organ-chamber, and other improvements as late as 1875. The general result of these additions was to supply a building sufficient for the wants of the parishioners. Of late years, however, time and decay began to make their effects very visible, the roof and walls took in damp in many places; the timber in the tower became decayed, while the accounts rendered by the churchwardens showed an annually increasing expenditure for indispensable repairs. Under these circumstances, the rector and vestry considered that their wisest course would be to consult a competent architect, with a view to having their church sufficiently enlarged to enable it to accommodate a congregation of 800, and at the same time to have its structure permanently improved.

Accordingly, the services of Mr. Drew, R.H.A., were secured; and he advised the re-erecting of the whole plan of the church, and its virtual rebuilding, retaining only, as far as it was possible to trace them, the old lines of the ancient structure. The tower of 1719, which, besides being in a bad and even dangerous condition, never was distinguished for beauty, was condemned and pulled down, and a new one has been built in a rather different position, so as to give room for lengthening the nave, and thus increasing the accommodation of the church. It is this new tower which is shown in our illustration.

The cost of the whole work has been about £3,000, of which the tower cost 2,200.

#### FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

##### THE VENTILATION OF BUILDINGS THROUGH THEIR WALLS.

The fourth\* of the present series of free lectures on subjects connected with building, under the auspices of the Carpenters' Company, was delivered by Professor W. Ramsay, Ph.D., F.R.S., on Wednesday evening, the 27th ult., before a large audience. Mr. J. T. Preston, Past Master of the Company, presided.

Professor Ramsay said that the subject of his lecture was "The Ventilation of Buildings through their Walls." There were doubtless many present who had studied ventilation well, and were able to tell its difficulties, and to conquer them. He had not, therefore, come to advocate any new system, but it occurred to him that it might interest those who interested themselves in building if he were to give them some first principles with regard to the subject, the object of ventilation, and the means of ventilation. In the first place, Why should they ventilate? and, in the second place, How do houses ventilate themselves without any artificial arrangements? Ventilation was the renewal of air in a room or hall. It was necessary, if a room was close, that the air should be renewed a certain number of times an hour. The air was rendered "bad," in the first place, by the breath which human beings gave out; and, in the second place, by the gas, candles, or lamps which they burned. Breathing or respiration consisted in taking in air which was largely composed of

oxygen gas, and the air breathed out contained carbonic acid gas. One hundred volumes of expired air contained about four volumes of carbonic acid gas, or about 1 grain in 55 cubic inches. If he were to breathe his own breath over and over again it would feel very uncomfortable; he should feel oppressed and ultimately probably faint. It contained too little oxygen, too much carbonic acid gas and poisonous animal matters, breathed out from the lungs. Inspired air contained nearly 21 per cent. of oxygen gas, 79.02 per cent. of nitrogen gas, and a very small amount of carbonic acid gas—0.04 per cent. On the other hand, expired air contained 16.03 per cent. of oxygen, 79.59 per cent. of nitrogen, and 4.38 per cent. of carbonic acid gas. It contained besides some poisonous substance, but what that was they did not rightly know as yet. Expired air also contained water-gas, or steam, shown by breathing on a cold sheet of glass or metal, when it was bedewed with small drops. Water-gas was not poisonous directly. One could go into an atmosphere containing quantities of steam and feel no discomfort; but there was one effect of living in a damp atmosphere which made one very uncomfortable, and ultimately caused injury. Health and comfort depended on the free passage of moisture through the skin, and its removal by evaporation. Water would not evaporate into air already saturated with water-vapour, and the effect of that was to prevent perspiration, which, although one might not be conscious of it, went on every day. On some cold days, though it did not rain, the streets did not dry, because the air was already nearly saturated with moisture. There was also present in expired air a small quantity of ammonia gas, but that was really without influence on animal life one way or another. The amount of oxygen consumed by an ordinary man during a day was extremely great—26½ oz., occupying 19 cubic feet; and he evolved by breathing 32 oz. of carbonic acid gas, occupying 17 cubic feet. He also breathed out a quantity of water-gas varying from 23 to 12 oz. During sleep the amount of carbonic acid gas was very considerably diminished. Their temperature fell in sleep, and they breathed more quietly and slowly than during the day, hence the amount of carbonic acid gas diminished by about one quarter. From ¼ to ½ oz. was given off through the skin; and from 1½ to 2 lbs. of water evaporated from the skin in twenty-four hours. Combustion of gas, oil, and candles produced carbonic acid gas and moisture. A good candle formed 1½ lbs. of a cubic foot of carbonic acid gas in an hour; a good oil-lamp half a cubic foot. A gas-burner burning 3 cubic feet of gas per hour gave rather more than 3 cubic feet. Hence two candles were nearly equal to one man. An oil-lamp gave two-thirds as much carbonic acid as a man, and a single gas-burner gave more than four men. Besides the fact of gas polluting the air with carbonic acid gas, it always contained traces of sulphur compounds, and these, on burning, yielded sulphurous acid gas, unpleasant, but not injurious,—and sulphuric acid, the vapours of which were very irritating. It was advisable not to burn gas in libraries, because the sulphurous acid affected the leather bindings of the books. All lights charred small particles of dust present in the air of a room, and so caused "closeness." Those dust particles which got near enough the light to be singed but not to be burned up consisted very much, in carpeted rooms, of particles of wool. The Professor then quoted, from "Air and Rain," by the late Dr. Angus Smith, a table giving the composition of normal air in London and Manchester. The average amount of oxygen in the streets and parks of London was 20.585 per 100, while the carbonic acid was 0.0341. In Manchester, —a more smoky town than London,—the carbonic acid in the streets amounted to 0.0403 per 100, in the parks to 0.0369, and in the streets during fog to 0.067. The Underground Railway tunnel in London contained 20.6 per cent. of oxygen instead of 20.9. The London theatres at 10 p.m. contained 0.076 to 0.32 of carbonic acid. Then in Manchester ill-ventilated workshops contained as much as 0.30 of carbonic acid, and in close buildings 0.16. In the London hospitals, which were very carefully looked after in that respect, although perhaps not so much as they ought to be, allowing 500 cubic feet per inmate, during the day-time there was 0.044 to 0.075 of carbonic acid, at midnight 0.052 to 0.104, and at 5 a.m. 0.062 to 0.087. In hospitals, therefore, there was rather more than the normal amount.

Candles went out when the oxygen was reduced to 18.5 parts per 100, and when the carbonic acid was increased to 2.1; and it was difficult for a man to breathe when the oxygen in the air was reduced to 17.2, and the carbonic acid increased to 3.5. If the carbonic acid was pure it was possible to breathe air containing as much as 20 per cent. without serious discomfort. Perfectly pure carbonic acid, therefore, did not appear to be so discomforting. Discomfort was produced chiefly by poisonous particles breathed out from the lungs. It was only quite recently that the number of dust particles in air had been counted, and this was due to Mr. John Aitken, of Falkirk, who had made a very remarkable discovery regarding the condensation of water on dust particles. The results were:—Outside (country), raining, 521,000 per cubic inch; outside (country), fair, 119,000; room, 4 ft. from floor, 30,318,000; room, near ceiling, 88,346,000; room, over gas burning, 489,000,000. Dr. Smith was able to find the nature of some of the particles, which consisted of burnt vegetable matter, probably wood used in lighting fires; hay, straw, and seeds; fibres, like flax, cotton, wool, starch granules; chiefly spores and sporidia, from 1/1000th to 1/5000th of an inch in diameter, developing rust and mildew, and also some almost certainly capable of developing various forms of disease, for example, fevers, measles, &c. Particles of coal or smoke did not appear to be dangerous, but particles of iron filings, wool-dust, and flour produced bad effects. Thus, file-makers, grinders, weavers, and tobacco-workers suffered from lung disease. The object of ventilation was to dilute foul air with fresh, and to remove foul air, so that such matters might not affect health. The greatest source of danger appeared to be expired air, not so much because it contained carbonic acid as because it contained foul animal particles. It might be taken, however, that the number of particles in a room might be measured by the amount of carbonic acid, and though carbonic acid from candles or gas did not contain such animal particles, still they would err on the safe side if they regarded it along with expired carbonic acid. The carbonic acid should never exceed six parts in 10,000.

Dealing with the second heading of his lecture—the means of ventilation—he said that although air might appear to be still in a room, it was always in gentle motion. When it moved more than 19 in. a second, or about 100 ft. a minute, they would begin to feel a draught. In an ordinary room, which was well ventilated, it moved more slowly. Even though the air moved perfectly still, its individual particles, which were excessively minute, were constantly moving about among each other. The warmer it was, the faster they moved. They could pass through any porous substance, such as plaster, dry stone, brick, &c., but not through water or thoroughly wet material; and, curiously, if the porous material was hot on one side and cold on the other, the air would pass from the cold side to the hot; that was to say, the air would enter a house provided it could get through the walls. This sort of motion was called diffusion. If it were possible to watch the motion of any single particle of air, its average rate of motion would be about one-third of a mile per second; but all the particles jostled each other, so that the actual progress made by any one particle averaged less than one two-millionth of an inch per second. The lighter a gas the more quickly its particles moved. Carbonic acid gas was nearly half as heavy again as air, and its particles moved more slowly. This continual motion caused gases to mix; even a heavy gas forming a layer below a light one mixed with the light one. Carbonic acid gas was heavy, yet it did not stay at the floor-level of a room; but mixed completely with the air of the room, which was much lighter. Hot air was lighter than cold air, and floated upwards at first; but ultimately mixed with the cold air, owing to diffusion. Although gases passed through porous substances, no solid particles like dust, however small, passed through; they were all deposited on the surface, or in the interior near the surface of the porous partition. A layer of cotton wool was a good filter for removing solid particles. Ventilation took place through chinks and cracks in windows and doors, through walls, floors, and ceilings, by special ventilators. The question came next, how much air did a man need? He breathed out between six and seven-tenths of a cubic foot of carbonic acid per hour, and

\* For reports of the previous lectures, see *Builder*, p. 109, 127, 148, 185, and.



air containing more than six parts in 10,000 of carbonic acid from human breath was, as before stated, close and unwholesome. The natural amount of carbonic acid in air was 4 parts in 10,000. A man might, therefore, add from 2 to 3 parts of carbonic acid to 10,000, or six-tenths of a cubic foot to 3,000 cubic feet of air in an hour. If a room 10 ft. by 30 ft. by 10 ft. were perfectly air-tight, it would become stuffy if a man were to breathe in it for an hour. But air was renewed, the rate depending on the difference of temperature between it and the outside air. According to some experiments made by Professor Pettenkofer, with a difference of 7 deg. Fahr., the air passing into a room containing 2,660 cubic feet in an hour was, with fire on and doors and window shut, 3,320 cubic feet; and with no fire and all crevices stopped, 1,060 cubic feet. Hence, without fire, the room changed its air more than twice each hour, so that a room 10 ft. by 15 ft. by 10 ft. would be more than large enough for one man, even if doors and windows were tightly sealed. A much quicker circulation produced draughts. The air could not be comfortably changed more than three or four times an hour. In Paris experiments had been made to show what size of rooms could be comfortably occupied by hospital patients, and these gave almost identical results. They allowed 1,120 cubic feet per man in an hospital, 3,530 for wounded, 5,300 for epidemics, 2,120 for workshops, 1,060 for barracks, 2,120 for large rooms for long meetings, 1,060 for rooms for short meetings, and 464 to 530 for schools. These figures were got by practical experiment, not by theory. Air passed through stone and lime, a very large amount of these materials consisting of air-space. The space in Bath stone filled by air was one-sixth of its bulk; in Portland stone, one-seventh; in Caen stone, one-eighth; and in Ketton stone, one-sixth. One square yard of sandstone allowed 4.7 cubic feet of air to pass per hour; quarried limestone, 6.5; brick, 7.9; tuffaceous limestone, 10.1; and mud, 15.4; with a difference of 4 deg. in temperature between the two sides. Although these various stones allowed very different quantities of air to pass, yet in practice it did not much matter which stones a wall was built of, because if a hard stone, such as a quarried limestone or granite, was used, the fragments were usually irregular, and more mortar was required; hence in practice an ordinary wall allowed the same amount of air through. About 7 cubic feet per hour per square yard was the average passage of air. Thus quarried limestone took about one-third of its weight of mortar; bricks, one-fifth to one-sixth; sandstone, one-sixth to one-eighth. As he had already stated, air was capable of passing through solid materials, but there was one essential proviso. The substance must be dry. If walls were damp no air passed. The spores in the dust settled and multiplied, instead of dying on the dry walls. The walls conducted away heat, and rendered the room cool. Ventilation, therefore, took place through the walls, or through the floor and ceiling, especially the latter. There was much more carbonic acid in the soil than in the air, hence air from the floor in a ground room was deleterious. Town refuse was a dangerous foundation for a house, for gases from decomposing matter entered through the floors. All rooms should be frequently aired. The organic matter productive of disease was oxidised in presence of air and moisture, and above all by sunlight. This was too often neglected. The walls of the wards of hospitals should be impermeable, so that germs could not lodge. It was essential that the walls should not be porous, and in order to avoid this, Portland cement, varnished on the surface, should be used as a coating. Ventilation should be artificially provided, and the walls, floor, and ceiling ought to be frequently disinfected and cleaned. The lecture was copiously illustrated with experiments.

## ART AND DESIGN.

The fifth lecture of the series was delivered on Wednesday evening, Feb. 6, by Mr. Banister Fletcher, F.R.I.B.A., who took for his subject "Art and Design, illustrated by diagrams and specimens in wood, iron, china, glass, &c., and by designs executed in wood as suggestions for the artisan." Sir John Lubbock, Bart., M.P., presided, and briefly introduced the lecturer.

Mr. Banister Fletcher said he had selected his subject because for a long time past English manufactures had ceased to hold undisputed sway in foreign markets, while now even our

home markets were threatened. In answer to the question What was to be done to enable England to recover its commercial supremacy, it appeared to be admitted by all that the great want of the day was education in art and design, for it was said that the goods made by foreign manufacturers were more artistic in design than English-made goods. The great success of English goods in the markets of the world hitherto had been due to solidity, strength, honesty of construction, and endurance. But their supremacy, even in these respects, had of late been questioned, and much harm had been done to English commerce and manufactures by the fraudulent copying of English trade-marks by foreign manufacturers. So impressed with the necessity of studying ornament and design was a member of the Livery of the Carpenters' Company, that he had generously placed at the disposal of the Court of the Company the sum of £2,500, to be invested in the names of trustees, and the interest spent in giving prizes to, and assisting in other ways, those who, in competitions in that hall, produced the most artistic work in wood. The first of those competitions would take place this year. The liverrymen in question was Mr. Henry Harben, a member of the County Council of London. Mr. Harben's own words in reference to the matter were as follow:—

"I am confident that in this country there is no fear as to solid work, but I am alarmed at the rapid strides that foreigners are making in competition with this country, and I am confident such competition will be successful unless more attention is paid to taste and design; and it is for this reason that I desire the prizes to be given for artistic work in wood, and also to further the education of workmen in art and design."

Having shown the intimate relationship of all the arts, the lecturer went on to say that the first and most essential element of beauty was proportion. He illustrated this by a doorway, which, if made twice as wide as it was high, offended all idea of proportion; if made as high as it was wide, it would be too squat; if added to by one-half in height, it at once became a well-proportioned opening. Its pleasing effect would be increased if made with an arched instead of a square top; the latter, in wide openings, had a heavy appearance, and nature curiously enough objected to it, for if the lintel were not cambered, it would present the appearance of being lower in the middle of the opening than at the sides,—a most unsatisfactory effect. Proportion, then, was the first thing to be thought of; no matter how plain the building or the design, if only well-proportioned it was almost certain to be a success. Proportion, however, would vary according to the work. For example, a drawing-room chair should not have the solidity of a dining-room or hall chair. If it had, it would offend the eye, conveying to it the idea of clumsiness, an impression which was accounted for by the absence of what was called "fitness." Stability also must be apparent in a design. A painful feeling was produced where that quality was absent, and therefore, in designing architectural work, it was important to keep vivid over void and solid over solid. But proportion alone would not ensure beauty, for, as Plotinus said, "unless individual parts have beauty, the beauty of a composition will be derived from the proportion established among ugly elements." It would be a failure of true art to make a design adapted for execution in one material and then to carry it out in an altogether different material. A design well adapted for execution in stone or marble would show false taste if executed in wood, and vice versa.

The lecturer next proceeded to enforce these and other points by directing attention to a series of large drawings which he had had specially prepared by Mr. Raffles Davison for the lecture. These drawings showed specimens of good and bad work in juxtaposition. He then went on to say that at the recent Congress of "The National Association for the Advancement of Art, and its application to Industry," Sir Frederic Leighton, Mr. Alfred Gilbert, Mr. T. G. Jackson, Professor Aitchison, and other authorities, pointed out that the present low level of attainment in industrial art was due to an uneducated public taste. Mr. Triggs (of the firm of Story Bros. & Triggs, cabinet-makers) had told him (the lecturer) that it was the love of cheapness,—the desire to have for 1*l*. what was really worth 1*l*. 10*s*., that was at the root of the production of so much badly-designed and badly-made furniture; that the "great [i.e.,

large] houses" only cared for large returns, no matter what the articles sold were like; to rapidly turn over a large capital at a profit of so much per cent.; that the old and good firms had been swept out of existence by the present conditions of trade; that the keenness of competition with the foreigner only left time for the production of showy and cheap goods that it was useless to produce good articles well made and in sound taste, because the masses wanted to have their drawing-rooms furnished like those of their betters, at any rate in appearance. The lecturer hoped that the country would speedily be aroused to a sense of the importance of the question at issue. He believed that if the English people could only know and realise the great deficiency in the artistic character of English goods, and that that deficiency was distinctly detrimental to English commerce, there would be a "new departure" which would astonish the world, although it would take some time to recover the lost "leeway." What was especially worth noting and emphasising was that well made and tastefully-designed articles of furniture could really be made to sell for less than the price asked for meretricious and ugly productions. Having shown how a skilled worker in wood, guided by good taste, could make many articles of domestic utility to adorn his own home, the lecturer concluded by saying that it was of no use for people in this country to try to find consolation by thinking that foreigners were doing no more than themselves. He read from a recent newspaper paragraph the following words:—"The love of art in France is illustrated in a suggestive way by the number of students who enter the School of Fine Arts in Paris. Twelve hundred students were on the roll last month. This is independent of the thousands who study in the studios of men of capacity. In our own Royal Academy classes there are never more than 200 or 300 students; and few of the leading artists admit students to their studios." Those who followed Art had the satisfaction to be derived from the fact that the principles of art, when found, never changed; therefore art workers had an advantage over those who followed Science. As to the latter, it had been well said that "the continued additions made to the common stock of knowledge frequently effect a complete revolution in their basis and superstructure: that the established doctrines of centuries may be swept away by the discoveries of a single day." He wanted young art-workers to remember that success was only to be achieved by those who took a genuine interest and pleasure in their work, without thinking primarily of the mere money they would earn. He believed with Bacon that it was the duty of every man to try to elevate his trade or profession. If every man became an earnest worker to that end,—and each one present could do something to advance the cause of art-education and technical proficiency, he would be helping to regain commercial greatness and prosperity for his country, and, what was higher and more to be desired, to make the nation stand in the forefront of art-producing and art-admiring nations. (Applause.)

The last lecture of the present course was delivered by Mr. Thomas Blashill, F.R.I.B.A., Superintending Architect of Metropolitan Buildings, on Wednesday evening last, the subject being "English and Continental Doors." There was a good attendance. Mr. Alfred Roshier, Master of the Company, presided. A report of this lecture will appear in our next.

**Surveyorship, East Barnet.**—The East Barnet Valley Local Board, at a meeting on Tuesday evening, elected Mr. George W. Brumell as surveyor and sanitary inspector, in the room of Mr. Ireland F. Rumble, who died suddenly a few weeks since. There were 179 applicants for the appointment, which number was reduced to nine, who were required to attend before the Board. The number was then reduced to three, and Mr. Brumell was ultimately selected by a practically unanimous vote.

**The Royal Hotel, Weymouth.**—The lease of the Royal Hotel, Weymouth, with its extensive premises, situate on one of the best sites of the town, facing the centre of the Esplanade, will expire in October of this year. King George III. used to hold his Courts there whilst residing in the town. It is proposed that the premises should be demolished and the site offered for sale.



# THE ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors to this Society was held on Wednesday afternoon last in the Arbitration Room at 9, Conduit-street, Professor T. Hayter in the chair, in the absence of the President, Mr. Alfred Waterhouse, R.A. The Hon. J. Mr. William H. White, read the annual report, which was prefaced by a *résumé* of the work for the years 1885-87, made for the purpose of insertion in the forthcoming "Red Book" of the Society, no "Red Book" having been issued for the last three years, though the reports have been published in the "Journal of Proceedings" of the Royal Institute of British Architects. The following is the report for the year 1888:—

During the past twelve months, six meetings have been held by your Council; 4451 have been distributed among thirty-four applicants, and three sessions of 202 each have been paid. The amount received by subscriptions has not decreased, being £7, 3s., as against 340L. 18s. received in 1887. The Architectural Association and the Royal Institute of British Architects continue their subscriptions, and nine new subscribers have been added, and your Council regret that the arrears for 1885 amount to almost twenty-one guineas, and express hope that these may be paid during the present year. The Capital Account receipts amount to £7, 15s., including 100L., a bequest free of duty, by the late Mr. George Godwin, a bequest of 50L., of duty, by the late Mr. J. R. Botham, and a donation of 15L. from Mr. William Emerson. Donations were also received from the Nottingham Architectural Association; the Royal Institute of Architects of Ireland; the British Architectural Book Society, per Mr. Cole A. Sims; Mr. R. St. A. Roumieu; Mr. Harold Hobbs; and the late Mr. Charles Richard L., whose recent early death your Council the Society have to deplore. Mr. Pink had been a contributor to the Society since 1881, and a member of the Council since 1886. Your Council also to record with regret the decease of Mr. N. Clifton, who was for more than thirty years a contributor, and was several times elected a member of Council; of Mr. R. P. Pullan, a frequent contributor to the funds; and of Mr. C. N. Ware, a subscriber since 1884. Your Council having lately subscribed £300 London and North-Western Railway 4 per cent. Debentures for 399L. 7s. 6d., invested capital now reaches the sum of £64, 2s. 4d. This purchase has been made out of the capital account, to which all legacies and donations are placed for investment only, in accordance with By-law 55.

The income account and balance-sheet for the year ended December 31, 1888, are herewith submitted. The decrease in the total income receipts, which in 1887 were 601L. 3s. 8d., and this year are £579L. 16s. 3d., is due to the fact that in 1887 a large balance was brought forward, and also three years' income-tax was remitted. The "Red Book" will be sent to every contributor upon its publication, and your Council trust each use it as a means to procure new subscribers and renewed donations. Your Council are of opinion that the regular annual issue of it is best, and tend to make the Society more known, and before better supported. A suggestion was made the cover should be altered, and the size of the enlarged, Mr. W. Hilton Nash, Member of Council, kindly offering to design a new cover; but your Council approve of the suggestion, they are of opinion that the change should not be effected until March next, when the Society will have completed the fortieth year of its foundation; the new "Red Book" by this means will commence in 1890.

The Chairman, in moving the adoption of the report, said he thought they might congratulate themselves to some extent on the progress of the Society, slow and small as that progress had been. He found from the *résumé* of the reports for the last few years that whereas in 1880 the subscriptions amounted to 315L., in 1888 they amounted to 341L. In the same period the funds on invested funds had increased from 156L. to 224L. The grants made in 1880 amounted to 345L.; in 1888 they were 455L. Pensions granted in the last year amounted to 40L., instead of 40L. in 1880. But, notwithstanding this, the Council often felt it to be impossible to deal adequately with claims which were made upon the Society by most of the applicants. The Council had need double the amount of money now entrusted to them. He could not help saying that, at the large number of men in the profession, the total amount of subscriptions last year—341L.—was a very meagre contribution from the architects of England, Scotland, and Ireland towards the relief of their brethren in distress (hear, hear). They certainly ought to be able to do better than that (hear, hear).

Mr. Charles Fowler, in seconding the adoption of the report, said he quite agreed that the inadequate support given to the Society by the members of the profession crippled the hands of the Council; but he thought it should be remembered that the Artists' General Benevolent Institution, which was established prior to the Architects' Benevolent Society, and was largely supported by architects, gave a great deal of help to architects and their families in distress, so that what was done by the Society did not by any means represent all that was done for the relief of distress in the profession.

Mr. J. Macvicar Anderson, in supporting the motion for the adoption of the report, said that while Mr. Fowler's statement was quite correct, he did think that architects ought to regard the Architects' Benevolent Society as having a primary claim upon their support, seeing that it was a society specifically identified with the profession. Indeed, he could not help feeling that the meagre income of the Society was a discredit, not to say a disgrace, to the profession (hear, hear). The funded property of the Society at present amounted to a little over 7,000L., but it ought to be raised to at least 10,000L. (hear, hear). If any movement could be set on foot to attain that object, he should be glad to assist.

The motion was unanimously agreed to, and after the election of new members of Council to take the place of those retiring by rotation, and the transaction of other formal business, the meeting terminated.

## ARCHITECTURAL SOCIETIES.

### Leeds and Yorkshire Architectural Society.—

A lecture on "Colour in Architecture and Interior Decoration" was given before the members of the Leeds and Yorkshire Architectural Society by Mr. William Scott Morton, of Edinburgh, on the 4th inst. The President of the Society (Mr. H. Perkin) was in the chair. Mr. Morton, whose lecture was illustrated by a collection of diagrams, observed that among the great architects of recent times colour had not been a strong point. Speaking generally, there did not seem to be much scope for colour display in their external work, but this might be owing to the limitations as to the materials that were suitable for their buildings. Artistically, it would perhaps be admitted that pictorial effects in large cities, and in general landscapes as far as buildings were concerned, depended more on mass and grouping than on colour, provided the prevailing tone were not objectionable. In America there seemed a much better field for architects in external work than in this country; the atmosphere was more pure, even in large American cities, and the material was very fine. He remarked generally that our northern regions were not favourable for the development of a strong colour treatment, the pitch of prevailing colour in sky, sea, and landscape being for the most part low in tone. In a reference to the Pompeian colours, he said all good reds were based on a yellow ground. With our prevailing greyish low tone we ought to use as a basis for all our colouring the complementary of grey, which would be a yellowish tint. The aim of the colourist should be to give to each apartment he treated a colour of pitch which would give some pleasurable excitement. It was evident that public places and apartments which were only used for a few hours at a time might well be decorated in a strong manner, whilst rooms for more homely and restful purposes required a more restful treatment. And in the tinting of all interiors it was of the first importance that flesh-colour should be borne in mind. One often saw wall-colours and masses of curtain and wall coverings selected which disagreed with the general tint of the face. This was utterly wrong, and so was the choosing of wall-coverings, where paintings were to be hung, which were not subordinate and accessory to the pictures. In considering the ceiling and mural decorations, the value of flesh colour struck one very powerfully, and it seemed as if its treatment enabled them to determine the merit of the artist as a colourist. At the present time there was a great desire to revive a good style of pictorial decoration. It was somewhat unfortunate that art of this class had been looked upon as not on such a high level as ordinary figure and landscape painting, but it required a very exceptional mind and knowledge to conceive and execute

such work as should be done in this connexion with architecture. One other unfortunate circumstance also lay in the increasingly migratory tendency of the times, and the shortness of ground leases, especially in London. On these grounds there was a natural disinclination to spend much money on what could not be easily removed, but it was to be hoped they should have earnest workers in this direction, who would be able to design and execute expressive and broad figure and landscape decorations at such cost as would allow of their becoming more general. In concluding, he said there still remained great difficulties in the study of colour, because there was so much that was undefinable. A discussion followed, the President, and Mr. W. H. Thorp, Mr. J. B. Fraser, Mr. J. P. Pollard, and Mr. Marshall taking part therein.—In the Library of the Philosophical Hall, on Monday evening last, Miss Garret, of London, delivered an address before the members of the Leeds and Yorkshire Architectural Society on the subject of "Interior House Decoration." The President of the Society, Mr. H. Perkin, occupied the chair.

*Liverpool Architectural Society.*—Mr. Edmund Kirby, President, in compliance with a requisition, has convened a special meeting of the Liverpool Architectural Society, to be held on Wednesday evening next, March 20, to consider and pass the revised rules of the Society on its alliance with the Royal Institute of British Architects.

*Edinburgh Architectural Association.*—At the usual meeting of this Association, held on the 7th inst., Professor Baldwin Brown presiding, Mr. James Clark read a second paper on "Ornament." The lecturer considered the various styles of ornament, comprising the ancient, mediæval, and modern periods, each of which had, he said, three important subdivisions: in the ancient—the Egyptians, the Greek, and the Roman; in the mediæval—the Byzantine, the Saracenic, and the Gothic; and in the modern—the Renaissance, the Cinquecento, and the Louis Quatorze. The lecturer next took up in detail the peculiarities of Indian, Chinese, and Japanese ornament. In referring to the importance of Japanese art, its leading characteristics were delineated in detail, and the study of these urged upon the members. No decorative art, he said, had exercised such an influence within the last twenty years as that of Japan, and every year great quantities of porcelain, enamels, carved ivories, bronzes, textiles, and leather papers were imported into this country. It was to be regretted, however, that many of these were not in a sense purely Japanese art, but were manufactured to meet the demand created by the English and American markets. Symbolical ornament was next gone into, and its importance and widespread influence noted. It was pointed out that symbolism formed the key to many kinds of ornament, adopted more particularly in architecture, but also in sculpture, heraldry, &c. Reference was made to the symbolical character of Egyptian, Jewish, Byzantine, Gothic, Indian, and Japanese ornament, and to the fact of its prevalent use in our cathedrals and churches. Mr. Clark pointed out, in regard to the application and misapplication of ornament, that, while deprecating a slavish copying of past styles, the designer of the present day should adopt and combine all that was best in the different periods of the past. The object of all ornament should ever be to decorate construction, and not to overload or overlay it. The decorator must aim at simplicity, repose, expression, fitness, and proportion, as opposed to excess of gaudiness and extravagance, uselessness, falsehood, lifelessness, clumsiness, want of balance, and the indiscriminate mixing of styles. The importance of colour in ornament was urged, and special reference was made to its charm and beauty as exemplified in past ages. In conclusion, the lecturer called attention to the present art revival, and such adjuncts to decoration as mosaics, tiles, pottery, stained glass, wood carving, and wrought iron.

*Royal Institute of the Architects of Ireland.* A special general meeting of this Institute was held on the 11th inst. at 37, Dawson-street, Mr. Thos. Drew, R.H.A., in the chair; present also Messrs. Sandham, Symes, J. R. Carroll, R. Cochrane, W. S. Symes, F. Franklin, J. L. Robinson, W. M. Mitchell, R. C. Millar, G. C. Ashlin, and Albert E. Murray, hon. sec. The meeting was convened to consider the advisability of affiliation with the Royal Institute of British Architects, as provided in their new



Charter. The hon. secretary read the notice of meeting; also read letters of apology from Messrs. Wm. Carroll, jun., of Ennis; W. J. Watson, of Warrenton; and Wm. Watt, of Belfast, &c. After considerable discussion on the subject, it was proposed by Mr. J. R. Carroll, and seconded by Mr. Albert E. Murray, and passed unanimously:—"That the Royal Institute of the Architects of Ireland desire to be one of the societies allied with the Royal Institute of British Architects, and that the hon. sec. be requested to take the necessary steps to have the alliance effected."

#### GREEK MOULDINGS ILLUSTRATION FUND.

SIR,—It has come to my knowledge that the object of this fund is not fully understood, although the origin and purpose were explained by you, namely, that the British School of Archaeology at Athens, acting upon a suggestion made by you to the Hellenic Society, and referred to the School Committee, voted a certain sum from their funds to enable one of their students, Mr. R. W. Schultz, architect, to go out to Athens to make full-sized drawings of the finest and most interesting examples of the mouldings used by the Greek architects.

From drawings of certain mouldings which he had shown to the School Committee,—as well as other drawings of high excellence,—they were perfectly satisfied that he could execute the proposed work in the best possible manner, and would carry out such a mission, if he undertook it, most conscientiously. Unfortunately, the funds in their hands would not admit of his being able to cover the whole ground,—especially as an attempt to induce the Council of the R.I.B.A. to assist in the undertaking met with no response. Under these circumstances you made the appeal in your journal which has produced a portion of the result aimed at; but there is room for at least twice the amount that has been already subscribed to enable Mr. Schultz, who has now been at Athens for more than a month, to make the full use of the season and the opportunity.

F. C. FENKOE.

The Chapter House,  
St. Paul's Church-yard,  
March 13, 1889.

P.S.—Perhaps I ought to mention that an independent request had been made in 1887 to the School Committee from Mr. H. Stannus to embark in this investigation.—F. C. P.

#### THE EGYPTIAN HALL AT THE MANSION HOUSE.

SIR,—I see that Mr. Brydon, in his paper on the "English Renaissance,"—for which, let me say, all who appreciate as it deserves that native adaptation of the Classical style, which, too long pushed on one side by the Gothic revival, is now happily re-vindicating its place in popular estimation, owe him hearty thanks,—has brought up again the old-tale of Palladio's design for the Mansion House offered by Lord Burlington, being rejected, on the score of its author being neither a freeman of the City nor a Protestant, in favour of that of Dance, who united both those qualifications for City favour. Probably there may be some groundwork of truth in the story. We can readily understand, and to a certain extent justify, the preference exhibited by the Committee of the Corporation for the design of an Englishman over that of a foreigner. But the details of the story may safely be rejected. The whole rests on the sole authority of the editor of Ralph's "Critical Review of the Public Buildings of London," writing nearly half a century after the erection of the Mansion House, and the way in which the "humorous story," as it is termed, is introduced leads to the idea that the writer did not intend it to be believed, and only aimed at raising a laugh at the expense of the Aldermen and Common Councilors of the City, always safe objects of cheap ridicule. Whether they were wise or unwise in preferring the English to the Italian design cannot be determined without seeing the rejected plan, and what that was we know not.

But the Mansion House is happily still standing, though sadly mutilated, to speak for itself, and to bear visible witness to the architectural powers of the designer. I am well aware that it has long been the fashion to decry this building as a heavy and tasteless pile, "equally discreditably," is the verdict in Britton's "Public Buildings of London," "to the taste of the architect and his employers." Ralph's editor asserts (whether truly or not I cannot say) that Dance,—"the man pitched upon," he contemptuously styles him, on the rejection of Palladio's design,—had been originally a shipbuilder, and that he carried the ideas of his former trade into his new profession. The façade of the Mansion House, he says, "bears all the resemblance possible

to a deeply-laden Indianman"; "the stairs and passages are all ladders and gangways"; while "the superstructures" (now removed) "answer accurately to the popular idea of Noah's Ark." In spite of all this vituperation,—criticism it cannot be called,—I am not alone in regarding the Mansion House as a building stately in itself, rich in well-conceived ornamentation, and most suitable for its purpose. It looks what it is, a civic palace. No one could mistake it for anything else. This, indeed, is the great merit of all Dance's buildings; they express their purpose. Who could mistake Newgate for anything but what it is,—a prison! St. Luke's, with its long rows of windows high up on the walls of the cells, bespeaks its object as a lunatic asylum. In Guildhall he was not so happy. He knew as little of Gothic as the men of his day generally, and he worked in fetters. But if not correct in style, there is bold originality in the design which goes far to atone for its errors, and stamps a distinctive character on it. "It, too, looks what it is,—or rather did so before its partial demolition left the front in its present deplorable lop-sided condition. Newgate, however, is certainly Dance's crowning effort, and, to quote the late Mr. Fergusson's appreciative words, "though not in a purist taste, but to be nothing else, is still one of the best public buildings in the Metropolis," and, I may add, one which our sadly characterless City can least afford to lose. But we are told it has outlived the purpose for which it was built, and occupies ground which might be better employed. So, suppose, the popular will should once declare that the striking building is sealed, and that, like Wren's churches, and Northumberland House, and the colonnade at Burlington House, and too many other fine and interesting buildings,—are we to include Gibbs's exquisite Church of St. Mary, which gives such dignity and beauty to the Strand—it may ere long exist only on paper, and the future generations wonder at the reckless blindness of a so-called age of culture which could wilfully destroy so many of its most precious architectural inheritances.

But if Newgate is Dance's *chef d'œuvre*, the Mansion House is not far behind it. I cannot always agree with Mr. Fergusson's verdicts, but he has my thorough agreement when he describes it as "a building not certainly in a purist taste, but an effective and gorgeous design." Nay, I can go along with him when he deprecates the unfeeling removal of the upper stories of the Egyptian Hall and of the Ball-room,—the latter of which many of your readers will remember, before the loss of which "two crowning masses," he says, the building "really stood proudly and well above the surrounding houses." I confess to some little surprise that Mr. Brydon should have treated the architectural merits of this truly characteristic specimen of the English Renaissance with a silence that almost looks like contempt. I cannot believe that one who shows so great an appreciation for the English classical architecture of the two last centuries really entertains such a feeling towards Dance's noble building. Few buildings of the day, especially in its interior fittings, its doorcases and mantelpieces and panelling, and its minor details, all carefully thought out, more fully illustrate the great innate artistic wealth, the embodiment of the civilisation and life of the people," as he justly terms it, which lies so close to us, but of which the modern designer too often takes so little heed. May we hope that one so well qualified for the task will furnish us, through your paper, with a careful survey of this admirable example of the style of his architect?

The more closely the Mansion House is examined the more evident will it be that it was not, as Ralph's, or his editor's, "humorous story" suggests, the work of a novice turning his attention for the first time to a new art, but that its designer was one who thoroughly understood his business, and who spared neither study nor pains to make the building worthy of its object. It is certain that Dance was a careful student of Vitruvius, of whose rules his well-known "Egyptian Hall" is an accurate reproduction. The name "Egyptian Hall" has, indeed, proved not a little perplexing to many, and various absurd theories, which it is needless here to particularise, have been invented to account for it. Mr. Brydon, in his "Review of Public Buildings," already referred to, confesses himself "unable to account for the appellation, as it displays no vestige of Egyptian architecture or decoration." Another writer shows some inkling of the truth when he states that the "architectural ornaments which gave it the name have been removed." But he finds a description of the hall once shown decorations of the style of Edfou or Karnak; or that it distantly resembled the "Egyptian Hall" in Piccadilly. Had these gentlemen known their Vitruvius better, they would have been saved all this puzzle-mongering. They have only to refer to his treatise "De Architectura" (lib. vi., c. 5, § 81) to find a description of what he designates as "Egyptian Hall," from which that in the Mansion House takes its name. Not that its architecture is in any true sense Egyptian, but simply that, as in the great hypostyle halls that commonly form part of the complex plan of the earlier and larger Egyptian temples, the chief range of columns, or "ground story," is surrounded by an upper range of columns of smaller

size, the intervals between which being open, as in a medieval "clearstory," light is admitted to the central portion of the hall. The Egyptian Hall at the Mansion House, as Dance built it, exactly answered to Vitruvius's description. What it may be seen in Campbell's "Vitruvius Britannicus," (ed. 1767). Above the existing row of Corinthian columns, eight on each side, was a second row of three-quarter composite columns, about two diameters less than the chief order from the entablature. Egyptian Hall, as the name was, was a series of windows, forming a clearstory, affording the light in which the hall is now so lamentably deficient, especially since the two end windows, the only windows left, have been filled with stained glass. The ceiling of the hall was flat. This upper order and its windows were contained in one of Mr. Fergusson's "crowning masses," popularly known as "Mayo's nests," as may be seen in plates in Stryke's "Stow" (ed. 1754) in Maitland's "London," and other old prints. Why this characteristic feature of Dance's design was taken down, or when the building thus received its first mutilation, I cannot say. The date is easily recoverable from the first edition of the plan, which I remember to have seen printed round of the expenses of the alteration, but it was many years back, and I neglected to take note of it. Names survive the things that gave them. The demolition of the upper storey has deprived the room of all right to the title, but the "Egyptian Hall" it is, and will, doubtless, ever remain.

"Some demon whispers 'Visto have a taste,'" and the whole fabric,—I have heard it threatened,—is demolished in obedience to some ruling whims of the day, or the whole civic municipality is swallowed up in the new County Council, and Lord Mayo's name cease to exist save in history. A reference to Vitruvius will show that in its present form, with a single row of columns supporting an architrave, and lighted only at the ends, the hall corresponds to his description of a "Corinthian Hall." But the name was not changed at the time of the alteration, and it is too late to do so now.

The corresponding superstructure, over the Ball-room, was removed only a few years since. It had a double row of windows similar to those of the Egyptian Hall, the loss of which renders this one the room somewhat gloomy, while the proportions are much injured by the lowering of the ceiling.

Ralph's complaint that "the staircases are ladders" is not now without some justification. The two existing staircases are at the same time too narrow and too steep for a staircase such as these. But for this Dance is not responsible, but the mutilators of his work. In the plan given in the "Vitruvius Britannicus," it will be seen that originally a broad and stately staircase, opening from the east side of the present Saloon, connected the first and second stories, filling the space now occupied by the inner sitting-room and the bedroom above, formerly the State bed-chamber. When the alteration was made I do not know. Why it was made is clear enough. The Mansion House is still somewhat deficient in sleeping accommodation, and original must have been still more so. So the State staircase was sacrificed to make a State bedroom. The new staircase, not having been one of the original apartments of the house that it is deficient in the stately decorations, such as doorcases, mantelpiece panelling, &c., which are so conspicuous in the other bedrooms. Another alteration on Dance's original plan has certainly produced nothing but advantage. The present Saloon once a private court-yard, surrounded with an unprotected colonnade, which afforded the only passage from the "Long Parlour" or dining-room to the "Drawing-room" on the other side. On snowy nights, I have been told, the flakes would blow in on the ladies' dresses. The covering in this area with a glass roof has added greatly both to the comfort and the usefulness of the Mansion House, and has supplied a really beautiful feature to the design.

Those who desire to know what the appearance of the interior of the Egyptian Hall was before it lost its upper story, will find what they want in the too little-known assembly Rooms at York Buildings, which were built, at its own expense, by its same noble amateur architect, "that truly English Vitruvius" (Drake), Richard Boyle, third Earl of Burlington, who figures in Ralph's apocryphal story. The first stone was laid March, 1717, and the whole was finished before Drake published his "Eboracum" in 1736. On its Egyptian Hall was described as "an antique Egyptian Hall," taken by Lord Burlington "from Palladio," it is said, "gives the plan, but tells you was never executed out of Egypt!" This room is a beautiful room of smaller dimensions (112 ft. by 40 ft. wide and 40 ft. high), but of more graceful proportions than the original Mansion House Egyptian Hall. On each side of its length it ranks of eighteen undiluted Corinthian columns returned at either end, where there are four making forty-four on the whole. The colonnade doubled in the centre of the length, where there are convenient lobbies and retiring-rooms. The upper story, or attic, is lighted by seventeen windows, each side divided by composite pilasters, wreaths dependent from their capitals. The ceiling



flat and panelled. Every detail of this beautiful design is most carefully studied; indeed, there are no works of the English Renaissance which, for sense of proportion and harmoniousness of effect, deserve more attention, or which more clearly display the genius of its designer, immortalised by Pope.

"Who plants like Bathurst or who builds like Boyle?" though less mutilated than the London hall, this design has not altogether escaped the hand of the despoiler. As Lord Burying-on designed it, the entrance was by a graceful semi-circular portico, which, in the earlier part of this century, was removed for the widening of the street, and replaced by a correct but frigid composition in Grecian Ionic, entirely out of keeping with the interior of the building.

EDMUND VENABLES.

Precentory, Lincoln.

# THE PROPOSED ADDITION TO WESTMINSTER ABBEY.

SIR,—What we want to see in the Abbey is the old arching back again beneath the aisle-windows, and a riddance of the tons of core encased in marble or surmounted by effigies which go to make up the memorials that encumber the room and obstruct light and sound, and are a blot on the interior of the ancient church, when looked upon as a house of prayer and devotion, as apart from its extra function as a national burial-place.

The Lady-chapel at St. Saviour's, Southwark, is a fair model, to my mind, of what is required, as being somewhat low, inexpensive, and at the same time of extensive area. The disposition of the monuments, after all wall-spaces are occupied, might be from pillar to pillar, filling alternate bays, and in certain instances jutting out at right angles, like great library book-cases, back to back against screens.

There are no Gothic-looking things at St. Paul's, and why should the poor Abbey be loaded with the other sort, to its lasting disfigurement?

Those whom the memorials commemorate have no more responsibility in the matter than probability we shall have, and if they could be canvassed those who put up the monuments even would probably cut the idea of entailing on posterity anything sumptuous or out of keeping.—Society for Ancient "Stick-in-the-mud" notwithstanding.

Living worshippers learn that the church is something to them, and that it might be more to thousands if it possibly can be so long as it is afflicted with the incumbrances imposed upon it during a period of death and degradation, save the actual dying; and it is nothing short of Church revival, which clamours for the area which is the people's, and which is now monopolised and misappropriated by effigies which stereotype a state of matters which happily proved only transient. If the Abbey is a church first, and then a burial-place, then off to Hampden Square with Newton and those like interferences with Church usage; if it is first a burial-place, then a church, I have done.

H. WEBBER.

# THE "CATES" PARIS STUDENTSHIP.

SIR,—The conditions of the above state that unless four candidates present themselves, the studentship will not be awarded.

I think this condition is likely to prevent many going in for the competition, since, if a student work hard to prepare himself for the examination, and become ever so proficient, he will stand no chance of winning the studentship unless three other men, no matter how ignorant of the French language, present themselves.

Would it not be wiser,—if it is not too late to make the revision,—for the judges to reserve the right of withholding the studentship if there is not sufficient merit shown?

It would indeed be a pity if a slip of this sort prevented Mr. Cates's generous offer attracting four competitors.

PRUDENTIA.

March 12, 1889.

"\*\* We think our correspondent is in the right.

# "RESTORATION."

SIR,—According to your last week's paper, Mr. Fickelthwaite objects to an old font being thoroughly restored."

What would he think of the chance of St. Pancras, Exeter, which has been pulled down to be foundations and "restored" so cleverly that even an expert may be excused if he think the building is of original Early English work with decorated additions?

G.

# CARTMEL CHURCH.

SIR,—I shall be obliged if you will allow me a short space in your columns in order to submit the following query, which, no doubt, some of your archaeological correspondents will be able to answer, or at least throw some light upon:—

"Of what stone was Cartmel Church, Lancashire, built, and from what place was the stone procured?"

I refer to the original building, which was founded about 1190, and restored in the middle of the seventeenth century.

A. R.

# The Student's Column.

## TOWN DRAINAGE.

### XI.—POSITION OF A HOUSE-DRAIN.

THE manner in which the offices of houses are arranged, either from necessity or choice, makes a considerable difference in the ease with which they may be drained, and makes a study of their position necessary before proper lines of drainage can be laid down. Large houses, if detached, are easier to drain than small ones which are not so, when, in the case of detached houses, the premises can be approached on either side. The choice of side depends upon the relative situations of the water-closets and the bath-room, and upon that of the scullery sink. If the water-closets are on the left-hand side, as in fig. 1, that is the side on which the drain

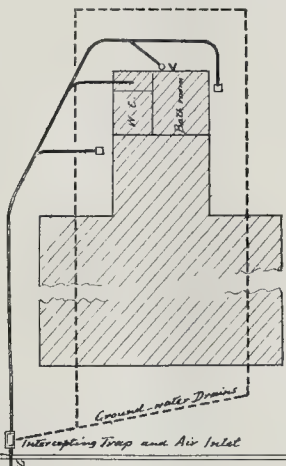


Fig. 1.

should be laid and continued to receive the scullery and the bath-water waste, the aim being to receive this at the head of the drain, and the water-closet branch should be received as far down the drain as possible, whether there be one branch or more, but always below the bath-water waste, and below the scullery outlet, where it is possible. In laying drains we have to do with houses already built, as well as with new ones, and must then take things as they are; but in the case of new houses, the drainage of the water-closets may be much facilitated by having regard to the principle just stated, viz.: that the drains should be laid on that side of the house on which the water-closets are arranged; that they should be situated so that their branches may be joined with the main drain as low down in its course as possible, and that the bath-room be so situated that the waste-water may be discharged into or near the head of the drain.

In the case of semi-detached houses, there is but one way of approach, but even in these it should be an object to receive first the water-closet branch; next, the scullery branch, and the bath waste at the extremity of the drain. In town houses, with close frontage, there is hardly any choice of position for the drain, and in small houses none. Some of these are much more difficult to drain than large houses. We cannot define the smallest house, but may regard the indications of the Model By-laws as sufficient in this respect. Their adoption by the sanitary authorities of towns is not compulsory, but they emanate from a fountain of wisdom in town drainage and kindred subjects, and their inculcations should be favourably regarded, as being the embodiment of the best judgment extant upon the subject. They go no farther than to lay down general directions, and they may be safely followed. The 54th section directs that "every person who shall erect a new domestic building shall provide in the rear of such building an open space exclusively belonging to such building, and of an aggregate extent of not less than 150 square feet, and free from any erection

thereon above the level of the ground, except a water-closet, earth-closet, or privy, and an ash-pit. He shall cause such space to extend laterally throughout the entire width of such building, and he shall cause the distance across such open space from every part of such building to the boundary of any lands or premises immediately opposite or adjoining the site of such building to be not less than 10 ft. The width is here taken at 15 ft., and the same width for each of the following classes of houses, viz., the 2nd, 3rd, and 4th in the following description. The sketch-plan, fig. 2, repre-

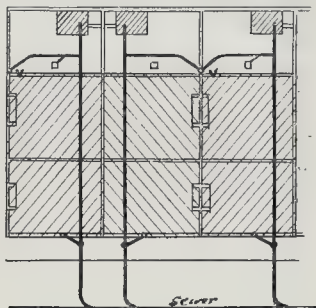


Fig. 2.



Fig. 2 A.—Section from Back to Front.

sents the smallest of the described houses, and fig. 3 represents either of the other classes described, viz., 2, 3, or 4, if allowance be made

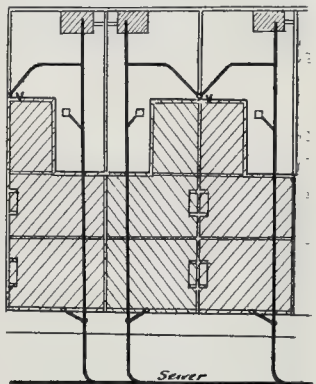


Fig. 3.

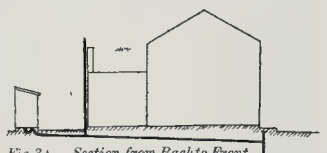


Fig. 3 A.—Section from Back to Front.

for the different dimensions. These variations in the distance across the open space have relation to the height of houses, taking the height to be that from the surface of the ground to the level of half the height of the roof, or to the top of the parapet, whichever may be the higher. If the height be 15 ft.—the second class,—the distance across the open space from the house to the boundary is to be 15 ft. at the least. If (3) the height be 25 ft., the distance is to be 20 ft. at the least; and if (4) the height be 35 ft., the distance is to be 25 ft. at the least.



In many cases it is impracticable to lay a drain from the back premises of a house to the sewer by any other way than under the house-floor, such as in those represented in the accompanying sketch plans 2 and 3, if there be no sewer at the back of the houses. There is sometimes a back road to such houses, in which there may be a sewer. Clearly, in that case, the proper way is to drain the premises into it. But if, as is more often the case, there is no such sewer, there is then no other way than under the house-floor, if the houses belong to different owners, which is also a frequent case. The water-closet and asphalt are the only erections permissible on the open space in question. The situation of these should be determined by the line in which the drain can best be laid. In the case of existing houses this is, as shown upon the plan, at a distance of a few feet from the party-wall, next the doorways, say 4 ft. from the wall to the centre of the drain-trench so as to leave a clear walking-way between the wall and the trench, the earth being either thrown up on the opposite side or removed at once out of the house, and in no case thrown up against the wall. Men carrying materials must pass in and out frequently, and require, in order that the work of the pipe-layer and joiner be not interfered with, a clear footway alongside the wall, in the line of the doorways through the house. Also, in the case of new houses, this is the best line for the drain. In new houses, the situation of the water-closet on the open space in question is determined accordingly, so that the line of drain may be straight through from it to the sewer. The ventilating-pipe may be erected against the wall of the water-closet if it can be carried up there to a sufficient height, not being less than 10 ft., and if no window of an opposite house be nearer than, say, 10 ft. It may be nearer than this if it do not terminate at a level below an adjacent window. Where there is any such opposite window, the better position for the ventilating-pipe is at V on the plan, a 6-in. branch with a right-angled junction being laid to it from the 6-in. drain, or of the same diameter as the drain, whatever that be. This is the only situation in house drainage in which a right-angled junction is proper: all others are oblique. The change of direction of this branch to accommodate the position chosen for the ventilating pipe must be made with a bend pipe, the intervening portions being straight from point to point.

### Books.

*Laxton's Price-book for Architects, Builders, Engineers, and Contractors.* Seventy-second Edition. (London: Kelly & Co. 1889.)

**C**ERTAIN books put forth their leaves with such punctual recurrence that one almost comes to regard them as natural productions, and a consequence, as indeed they are, of the revolving seasons. In this class is "Laxton," the seventy-second edition of which now lies before us.

The new issue has apparently been set up from fresh type, with some omitted and much additional matter, and the care with which the revision has been conducted is evident on almost every page, notably in the clear and full treatment of the subject of electric lighting. Nevertheless, much remains to be done. The prefatory essays on construction, which have reappeared from year to year time out of mind, are now a little obsolete. No one, for instance, now thinks of tipping concrete into trenches from a height of 10 ft., nor is it usual to make the concrete in foundations twice the width of the brick walls. Such a rule would be subject to endless modifications to meet the special circumstances of each case. In swampy, marshy, or boggy soil, an increased thickness of concrete is recommended. But the thickness has nothing to do with the nature of the soil. The thickness depends upon the superstructure—the character of the soil affects the bearing area. This is only one instance of an inadequate treatment of a practical subject. Similar laxity is observed in other cases. This part of the work requires a searching revision, or it might with advantage be omitted altogether. It is not wanted by the architect, engineer, builder, or contractor, and such information is best sought by those who do require it in special and full treatises. A price-book is best confined to prices. There is room for more than even Laxton gives. For instance, the many new

tropical and Colonial woods which are every day being more used should find a place. At present they are quite ignored, and other materials of common use are looked for in vain amongst the 72,000 prices this book contains. On the other hand a good deal of space is now unnecessarily occupied by schedules of old-fashioned joinery now no longer used.

There is no harm in the retention of the Metropolitan Building Act, which might be conveniently illustrated by an outline map showing the area of the operation of the Act and the division of the districts, and the supplementary chapters, including the heads of building contracts, &c., are all useful for reference. The prices throughout the book are high, and for ordinary work will bear a discount of from 10 to 12 per cent., and if the book becomes the acknowledged standard of reference in the Courts of Law, as its compilers desire, the builder and contractor will have no cause to complain.

*The Railway and Canal Traffic Act, 1888.* By W. A. HUNTER, LL.D., M.P., London: Sweet & Maxwell.

THIS is at once a history of past railway legislation, and a clear and comprehensive exposition of the new Act in relation to the companies' existing Parliamentary powers. Some scores of Acts are quoted, the existing maximum rates being conveniently placed for comparison with the revised classifications and schedules just submitted to the Board of trade. Thus a mass of information, not readily available to any but members of the legal profession, is placed before the public just when particularly useful. With the aid of such a guide, the revised classifications and schedules become much more intelligible, and the study of them a much less formidable task. The author gives particular attention to the "terminals" question, and quotes a large number of cases which have been before the Commissioners, giving *extenso* their observations upon some of the more prominent (or, as Mr. Hunter regards them, "historical") cases. Extracts are also given from the annual reports of the Inter-State Commerce Commission.—The American body corresponding to our Railway Commission. We notice that they take much the same view of the impracticability of securing a satisfactory "scientific basis" for rates, as that to which we gave expression in our "Notes" last week. The passage in the American report runs as follows:—"The question of the reasonableness of rates involves so many considerations which may at first blush seem foreign, that it is quite impossible to deal with it on purely mathematical principles, or on any principles whatever, without a consciousness that no conclusion which may be reached can by demonstration be shown to be absolutely correct."

The classification of goods is conveniently arranged in alphabetical form at the end of the book. It would have been still more instructive if the class in which the respective articles appear in the Railway Clearing-house classification had been also given; for the latter is the acknowledged basis of the new classifications, and as about 80 or 90 per cent. of the articles enumerated remain classed as before, it would be interesting to be able to see at a glance where the few points of variation occur. Probably, however, the author did not have time to make this comparison, as the book was issued within a week or two after the publication of the new classifications. This may also account for such errors as the absence of any italicised words from the terminal clauses on pp. 168, 172, 180 (for which the reader has been particularly directed to keep a look-out!). The index is very elaborate and carefully compiled, full reference being given for every Act or "case" quoted.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

4,373, Lavatory Basins and Fittings. T. W. Twyford.

Several modifications of shape are included in the one specification relating to this invention. The principal objects aimed at are:—(1) That the waste passage is free and accessible; (2) that a turned-down edge, which gives a better appearance, is used; (3) shell basins, &c., are used for soap, &c.; (4) the flanged end of the down-pipe is fixed to the main outlet; (5) supporting the wash-basin upon bracket supports faced with a yielding material; and (6) in fixedly securing the lavatories to the supporting brackets. The basin, flange-top, standing waste, overflow shell, supplies, and other parts

of the lavatory are cast in one piece of earthenware or metal.

4,868, Stop-cocks and Water-taps. T. Wilson. According to this invention, in order to prevent leakage, and to render the taps self-closing, the body and socket of the tap is formed as usual, but at the narrow end a slight shoulder or valve-seat is formed, in which is ground a corresponding shaped conical plug having a passage through the same. A coiled spring is so fixed as to allow the plug to act just in the proper position on turning the thumb-piece, and limits also its action in either opening or closing the tap. A small passage is made in the base of the tap so that the pressure of water tends to force up the conical plug and thus prevent leakage.

5,169, Improved Flooring Cramp. W. Braconwell and W. Hayhurst.

According to this invention, the improvement is in the manner of affixing the cramp to a joist or beam. The levers are also made to clip the joist to prevent any slipping.

5,214, Porous Artificial Stone. W. D. Gooch and others.

According to this invention, porous stone is made in what is termed the dry way. The ingredients which are sand, asbestos, borax, and litharge, are dried and heated up to a dull red heat, which produces an amalgamation of the particles, and constitutes a stone of a very fine texture, which may be used for various specific purposes.

7,594, Apparatus for Ventilating or Drying.

G. H. Ellard. The invention which is the subject of this patent is designed partly with the object of drying or seasoning timber or other substances; but is also applicable for ventilating or warming apartments. In drying timber, it is arranged so that free spaces are left for the passage of air, and beneath the stack is a perforated inlet pipe, which pipe is surrounded by steam or hot-water tubes. The air is thus warmed and passes over the timber, or in other cases through the apartment.

8,963, Manufacturing Bricks and Tiles. W. Sawyer.

This invention relates to machinery designed to improve the continuous process of making brick and tiles, &c., wherein the clay is taken from the pits, mixed, pugged, moulded, cut, and the bricks or tiles removed for drying or burning. In the mechanism waggons or trolleys are run by gravity or propelled one in and one out and automatically switched. Grinding rollers of special pattern are also fitted, and a movable platform supports the waggons, raising them to the service-frame to the suitable level for removal.

#### NEW APPLICATIONS FOR PATENTS.

Feb. 25.—3,310, J. Young, Window Frames and Sashes.—3,328, W. Budd and others, Draught and Dust Excluders for Doors, &c.—3,332, A. Shaw and J. Parkinson, Ventilating Rooms.—3,339, J. Groom, Heating Buildings, &c.—3,354, A. Ponton and others, Bricks or Tiles.—3,355, W. Hubbard, Wall Tiles, &c.—3,375, J. Becker and W. Winald, Apparatus for Whitewashing, Staining, and Painting Ceilings.

Feb. 26.—3,432, O. Brindley, Door-fasteners.—3,466, M. Goldschmidt and A. Michaelis, Water-closets.

Feb. 27.—3,516, A. Ferrett, Facilitating Removal of Sashes for Painting, &c.

Feb. 28.—3,563, H. Lord, Water-closets.—3,580, F. Berry, Electric Bell.—3,595, C. Reeve and J. Hands, Window and Door Fasteners.—3,601, J. Butler, Extracting Cows for Chimneys.—3,602, E. Cattley, Automatic Sash-fastener.

March 1.—3,659, D. Boyd, Sash-fastener.—3,668, T. Salter, Flushing Apparatus, &c.

March 2.—3,700, J. Decey, Flushing Cisterns.—3,710, J. Howie, Syphon Cisterns for Flushing Water-closets, &c.—3,729, H. Mansfield, Attachment for Pointing Trowel.—3,741, F. Marshall, Securing Knobs and Handles on Door-spindles.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

17,654, A. Green, Gully-trap, &c.—17,599, J. Williamson, Fastening for Doors, &c.—490, A. Johnstone, Mitring and Cramping Tool.—1,039, A. Randall, Window-sash Fastenings.—1,071, J. Wilkie, Builders' Cramps.—1,138, J. Keeler, Step-ladder Hinges.—1,224, J. Milne, Flushing Apparatus.—1,476, F. and D. Spence, Fire-resisting Materials.—1,485, J. Newcombe, Planing the Mitre of Picture or Glass Frames.—1,577, A. Youden, Sliding Windows.—1,688, A. Withers, Sash-fasteners, &c.—1,742, E. Done and J. Deriog, Sash Lifter and Fastener.—2,023, J. Johnson, Rain-water Down-pipes.—2,061, E. Edwards, Holding open Windows in any position.—2,083, W. Thompson, Automatic Door Check and Spring.—2,121, G. Wright, Block Tie, or Block Binding, &c.—2,207, J. Day, Flushing Apparatus for Water-closets.—2,289, J. Homan, Fireproof Structures, and Bricks for same.—2,319, R. Livingston, Opening and Closing Casements, &c.—2,374, W. Leggett, Securing Casement Windows.—2,388, R. Fox, Chimney-pots.—2,403, J. Hughes, Decorating Fireproof Material.—2,477, R. Knight, Heating and Ventilating.—2,575, W. Punched, Depositing Concrete.—2,688, W. Defries and V. Feeny, Hinges.—2,706, E. Edwards, Window-sash Fasteners.—3,057, J. Evans, Fasteners for Window-sashes, &c.







**The Peabody Fund.**—The twenty-fourth annual report of the Trustees of the Peabody Donation Fund (for the year 1888) has just been issued. The trustees report that the net gain of the year, from rents and interest, has been 29,611. 11s. 2d. The sum given and bequeathed by Mr. Peabody was, in 1862, 150,000; in 1866, 100,000; in 1868, 100,000; and in 1873, 150,000; making a total of 500,000; to which has been added money received for rent and interest, 465,182. 7s. 9d., making the total fund on the 31st of December last 965,182. 7s. 9d. Of the 390,000, borrowed of the Public Works Loan Commissioners and others, mentioned in previous reports, the Trustees have paid off 128,668. 18s. 4d., leaving a balance unpaid of 261,333. 6s. 8d. In addition to this, the Bank of England has advanced the sum of 10,000, so that the total indebtedness of the Trustees at the end of the year was 271,333. 6s. 8d. Within the past year the Trustees have expended on land and buildings 13,064. 3s. 4d., making the total expenditure to the end of the year 1,232,283. 19s. 11d. The three new blocks of buildings on the Pimlico estate, referred to in the last report, were completed in November, and are now fully occupied. Up to the end of the year, the Trustees have provided for the artisan and labouring poor of London 11,275 rooms, besides bath-rooms, laundries, and wash-houses, occupied by 20,413 persons. These rooms comprise 6,071 separate dwellings, say 76 of four rooms, 1,789 of three rooms, 2,398 of two rooms, and 808 of one room. The nature of the occupation of the head of each family is set forth in a table which accompanies the report. It is stated that the average weekly earnings of the head of each family in residence at the close of the year was 14. 3s. 9d. The average rent of each dwelling was 4s. 9d. per week, and of each room 2s. 2d. The rent in all cases includes the free use of water, laundries, sculleries, and bath-rooms. The birth-rate for the year in the Peabody dwellings reached 39.61 per 1,000, which is 8.91 per 1,000 above that of all London for the same period. The death-rate, including the deaths of fifty-nine inhabitants of the buildings who were removed to hospitals, was 18.47 per 1,000, which is the same as that of London. The infant mortality was 126.87 in each 1,000 births, or 19.57 below that of London. The actual number of births and deaths are from returns furnished by the District Registrars, and the calculations have been checked and confirmed at the General Register Office, Somerset House. Mr. J. Crouch is the Secretary of the Fund, and the offices are at 64, Queen-street, Cheapside.

**Tenth Annual Exhibition of Meteorological Instruments.**—At the ordinary meeting of the Royal Meteorological Society, to be held, by permission of the Council of the Institution of Civil Engineers, at 25, Great George-street, Westminster, on Wednesday next, the 20th inst., Dr. W. Marrett, F.R.S. (President), will deliver an address on "The Sun,—its Heat and Light," which will be illustrated by experiments. After the reading of this address the meeting will be adjourned, in order to afford the Fellows and their friends an opportunity of inspecting the exhibition of actinometers and solar radiation apparatus, and of such new instruments as have been invented and first constructed since the last exhibition. The exhibition will, at the request of the Secretary of the Institution of Civil Engineers, be open in readiness for their meeting on Tuesday evening, the 19th instant, and will remain open till Friday, the 22nd instant.

**Architectural Association Surveying Class.**—This class is to be formed for the study of surveying, under the direction of Mr. A. T. Walmisley as Instructor, who will give seven lectures during the session on Surveying, each of which will be followed by a field lesson on Hampstead Heath. In consequence of increased demands on his time professionally, Mr. Walmisley will be unable to personally superintend the field lessons, which will be conducted by Mr. F. W. Quick as Demonstrator. Mr. Walmisley will at the conclusion of the course give four additional indoor lectures on special instruments. The class will not be formed unless ten members have given their names to the Secretary, Mr. C. E. Pinks, 21, Parliament-street, before the end of May.

**Sewerage and Drainage, Leighton Buzzard.**—We hear that the Rural Sanitary Authority of Leighton Buzzard have instructed Mr. J. C. Mellis, C.E., to prepare a scheme for the drainage, sewage disposal, and water-supply of the town.

**The Arts and Crafts Exhibition Society.**—The Arts and Crafts Exhibition Society has taken permanent offices at No. 45, Great Marlborough-street, W., and is busy preparing for another Exhibition. Mr. Arthur Crane remains President, and Mr. Ernest Radford has been re-elected to the Secretaryship. The Society has already more than doubled its membership of last year, and from all we hear it bids fair to become a thoroughly representative body. The Secretary will be glad to supply all information about its aims and objects. At a meeting of the Society held on February 27, the following new members were elected, viz., Messrs. John Selcher, J. F. Bentley, R. T. Blomfield, Madox Brown, B. Creswick, Conrad Dressler, Henry Holiday, Herbert Horne, Holman Hunt, Selwyn Image, George Jack, J. E. Knapp, A. H. Mackmurdo, Audley Mackworth, Ernest Newton, William Nyon, F. W. Pomeroy, Halsey Ricardo, T. M. Rooke, George Simonds, R. Spencer Stanhope, J. M. Strudwick, Hamo Thornycroft, and Christopher Whall; Miss Kate Faulkner, Mrs. de Morgan, and Miss Mary Morris.

**"Cum Marte Minerva."**—On Monday, the 25th inst., the new drill-hall and headquarters of the 20th Middlesex (Artists') Rifle Volunteers will be formally opened by T. R. H. the Prince and Princess of Wales. The buildings have been erected, at a total cost of 6,500, from the designs of the commanding colonel, Robert W. Edis, F.S.A. and L.C.C. They are situated in Duke's-road, Euston-road, at the rear of St. Pancras parish church. Nearly one-half of the expense has been subscribed by members of the regiment.

**The Pelican Club.**—We are informed that Messrs. Perry & Co.'s tender has been accepted for erecting the new Pelican Club, Gerrard-street, Shaftesbury-avenue. Messrs. Martin & Purchase are the architects.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                                         |           | £. | s. | d. | £. | s. | d. |
|-------------------------------------------------|-----------|----|----|----|----|----|----|
| Greenheart, B.G. ....                           | ton       | 10 | 0  | 0  | 10 | 0  | 0  |
| Teak, E.I. ....                                 | 10        | 0  | 17 | 0  | 0  | 0  | 0  |
| Sequoia, U.S. ....                              | foot cube | 0  | 3  | 0  | 0  | 3  | 0  |
| Ash, Canada ....                                | 3         | 10 | 0  | 0  | 0  | 0  | 0  |
| Birch ....                                      | 3         | 10 | 0  | 0  | 0  | 0  | 0  |
| Elm ....                                        | 4         | 0  | 0  | 0  | 0  | 0  | 0  |
| Fir, Dantsic, &c. ....                          | 2         | 0  | 0  | 0  | 0  | 0  | 0  |
| Oak ....                                        | 2         | 10 | 0  | 0  | 0  | 0  | 0  |
| Canada ....                                     | 3         | 5  | 0  | 0  | 0  | 0  | 0  |
| " yellow ....                                   | 3         | 10 | 0  | 0  | 0  | 0  | 0  |
| Lath, Dantsic ....                              | fathom    | 4  | 10 | 0  | 0  | 0  | 0  |
| St. Petersburg ....                             | 10        | 0  | 0  | 0  | 0  | 0  | 0  |
| Wainscot, Riga, &c. ....                        | log       | 2  | 15 | 0  | 0  | 0  | 0  |
| " Odessa, crown ....                            | 0         | 0  | 0  | 0  | 0  | 0  | 0  |
| Deal, Finland, 2nd and 1st, std. 100            | 0         | 0  | 0  | 0  | 0  | 0  | 0  |
| " 4th and 3rd ....                              | 0         | 0  | 0  | 0  | 0  | 0  | 0  |
| Riga ....                                       | 7         | 10 | 0  | 0  | 0  | 0  | 0  |
| St. Petersburg, 1st yellow ....                 | 11        | 10 | 0  | 0  | 0  | 0  | 0  |
| " 2nd ....                                      | 10        | 0  | 0  | 0  | 0  | 0  | 0  |
| " white ....                                    | 8         | 10 | 0  | 0  | 0  | 0  | 0  |
| Swedish ....                                    | 9         | 0  | 0  | 0  | 0  | 0  | 0  |
| White Sea ....                                  | 9         | 10 | 0  | 0  | 0  | 0  | 0  |
| Canada, Pine, 1st ....                          | 10        | 0  | 0  | 0  | 0  | 0  | 0  |
| " 2nd ....                                      | 11        | 0  | 0  | 0  | 0  | 0  | 0  |
| " 3rd, &c. ....                                 | 8         | 0  | 0  | 0  | 0  | 0  | 0  |
| " Spruce, 1st ....                              | 9         | 10 | 0  | 0  | 0  | 0  | 0  |
| " 2nd and 3rd ....                              | 7         | 10 | 0  | 0  | 0  | 0  | 0  |
| New Brunswick, &c. ....                         | 6         | 15 | 0  | 0  | 0  | 0  | 0  |
| Battens, all kinds ....                         | 6         | 10 | 0  | 0  | 0  | 0  | 0  |
| Flooring Boards, 94, 1 in, prepared, First .... | 0         | 11 | 0  | 0  | 0  | 14 | 8  |
| Second ....                                     | 0         | 8  | 0  | 0  | 0  | 10 | 8  |
| Other qualities ....                            | 0         | 5  | 8  | 0  | 0  | 7  | 8  |
| Cedar, Cuba ....                                | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Honduras, &c. ....                              | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Mahogany, Cuba ....                             | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| St. Domingo, cargo average ....                 | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Mexican ....                                    | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Tobacco ....                                    | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Honduras ....                                   | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Bor, Turkey ....                                | ton       | 15 | 0  | 0  | 0  | 20 | 0  |
| Rose, Rio ....                                  | 14        | 0  | 0  | 0  | 0  | 18 | 0  |
| Bahia ....                                      | 0         | 0  | 0  | 0  | 0  | 1  | 3  |
| Satin, St. Domingo ....                         | foot      | 0  | 0  | 0  | 0  | 0  | 0  |
| Porto Rico ....                                 | 0         | 0  | 0  | 0  | 0  | 0  | 0  |
| Walnut, Italian ....                            | 0         | 0  | 4  | 0  | 0  | 4  | 0  |

#### METALS.

|                                  |     |    |   |    |    |    |    |
|----------------------------------|-----|----|---|----|----|----|----|
| Iron—Bar, Welsh, in London.....  | ton | 5  | 5 | 0  | 5  | 10 | 0  |
| " " at works in Wales .....      | 5   | 15 | 0 | 5  | 0  | 0  | 0  |
| " Staffordshire, in London ..... | 5   | 10 | 0 | 5  | 0  | 0  | 0  |
| Copper—                          |     |    |   |    |    |    |    |
| British, cake and ingot.....     | ton | 59 | 0 | 0  | 61 | 0  | 0  |
| Best selected .....              | 60  | 0  | 0 | 0  | 0  | 0  | 0  |
| Australian .....                 | 0   | 0  | 0 | 0  | 0  | 0  | 0  |
| Chili, bars .....                | 55  | 10 | 0 | 56 | 0  | 0  | 0  |
| Yellow Metal.....                | lb. | 0  | 0 | 64 | 0  | 0  | 74 |
| Lead—Fig. 8, at works .....      | 12  | 19 | 0 | 0  | 0  | 0  | 0  |
| English, common brands .....     | 12  | 17 | 6 | 0  | 0  | 0  | 0  |
| Sheet, English .....             | 0   | 0  | 0 | 0  | 0  | 0  | 0  |
| Spelter—                         |     |    |   |    |    |    |    |
| Belgian, special .....           | ton | 17 | 5 | 0  | 17 | 5  | 0  |
| Ordinary brands.....             | 17  | 2  | 6 | 17 | 2  | 6  | 0  |
| Tin—                             |     |    |   |    |    |    |    |
| Banco .....                      | ton | 98 | 0 | 0  | 0  | 0  | 0  |
| Billiton .....                   | 87  | 0  | 0 | 0  | 0  | 0  | 0  |
| Straits .....                    | 94  | 15 | 0 | 0  | 0  | 0  | 0  |
| Australian .....                 | 96  | 0  | 0 | 0  | 0  | 0  | 0  |
| English Ingots.....              | 97  | 0  | 0 | 0  | 0  | 0  | 0  |
| Zinc—English sheet .....         | ton | 21 | 0 | 0  | 0  | 0  | 0  |

#### OILS.

|                            |        |    |   |    |    |    |   |
|----------------------------|--------|----|---|----|----|----|---|
| Lined .....                | ton    | 18 | 7 | 6  | 18 | 12 | 0 |
| Cocunut, Cochia .....      | 27     | 0  | 0 | 23 | 0  | 0  | 0 |
| Ceylon .....               | 25     | 0  | 0 | 0  | 0  | 0  | 0 |
| Palm, Lagos .....          | 25     | 0  | 0 | 0  | 0  | 0  | 0 |
| Rapeseed, East India ..... | 28     | 10 | 0 | 0  | 0  | 0  | 0 |
| " brown .....              | 27     | 0  | 0 | 0  | 0  | 0  | 0 |
| Cottonseed, refined .....  | 21     | 0  | 0 | 0  | 0  | 0  | 0 |
| Tallow, Old and New .....  | 21     | 0  | 0 | 0  | 0  | 0  | 0 |
| Lubricating, U.S. ....     | 6      | 0  | 0 | 0  | 0  | 0  | 0 |
| " refined .....            | 7      | 0  | 0 | 12 | 0  | 0  | 0 |
| Tax—Stockholm .....        | barrel | 1  | 2 | 0  | 1  | 2  | 8 |
| Arachal .....              | 0      | 14 | 0 | 0  | 14 | 0  | 0 |

#### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**AUDENSHAW.**—For a cotton wadding mill at Audenshaw, for Major Lingard. Mr. J. H. Burton, architect, Warrington-street, Ashton-under-Lyne:—  
 Hannah Fielding, Droyden ..... £1,460 2 6  
 Charles Genney, Manchester ..... 1,472 16 8  
 Zachariah Fike, Hootley Hill ..... 1,394 4 0  
 Joseph Clayton, Denton ..... 1,384 10 0  
 Thomas Storer, Denton ..... 1,350 0 0  
 Warrington Harb. Board, Ashton-under-Lyne ..... 1,340 0 0  
 Thomas Warrington, Hyde ..... 1,344 14 0  
 Garvie, Barnes, & Co., Stalybridge ..... 1,310 0 0  
 Henry Gardner, Ashton-under-Lyne ..... 1,276 13 0  
 Charles Morris, Ashton-under-Lyne ..... 1,276 13 0  
 J. W. Williamson, Ashton-under-Lyne ..... 1,266 0 0  
 Joseph Lewis, Hootley Hill ..... 1,254 2 10  
 Allen Holmes, Ashton-under-Lyne ..... 1,250 0 0  
 Jabez Gibson, Dukinfield ..... 1,260 0 0  
 Joshua Garvie, Ashton-under-Lyne ..... 1,256 0 0  
 Clement Wainwright, Gorton ..... 1,250 0 0  
 Thomas Dean, Ashton-under-Lyne ..... 1,230 0 0  
 Ralph Whitall, Manchester ..... 1,229 0 0  
 W. & S. Miles, Stalybridge ..... 1,225 17 6  
 Cochrane, Leytonwood ..... 1,225 8 0  
 Joseph Davison, Manchester ..... 1,224 0 0  
 John Robinson, Ashton-under-Lyne\* ..... 1,185 0 0  
 Robert H. Booth, Stalybridge ..... 1,047 10 0  
 \* Accepted.

**BRIGHTON.**—For road and sewer. The Drive, Brighton, on the Stanford route, St. Charles Street, Brighton, 38, Duke-street, Brighton:—  
 J. Longley & Co. .... £1,295 0 0  
 J. Parsons & Sons ..... 1,215 1 10  
 J. Warrington & Son ..... 1,200 0 0  
 J. J. Clark ..... 1,108 0 0

**CANTERBURY.**—For alterations and additions to Salvation Army Barracks, buildings at Canterbury, General Booth. Mr. J. Williams Dunford, architect, Queen Victoria-street, London:—  
 Dene & Son, Deal ..... 2,615 0 0  
 Cochrane, Leytonwood ..... 1,525 8 0  
 Martin, Battersea ..... 650 0 0  
 Amos & Foad, Whitstable ..... 498 10 0  
 Terry & Son, Canterbury ..... 453 0 0  
 W. H. Wiles, Sittingbourne ..... 326 0 0

**COLCHESTER.**—For alterations and additions to Hythe Hill House. Mr. J. W. Start, architect, Colchester, Colchester:—  
 R. Beaumont ..... £173 0 0  
 T. J. Ward ..... 162 0 0  
 A. Chambers (accepted) ..... 146 0 0  
 [All of Colchester.]

**GOOLE.**—For alterations and additions to Salvation Army Barracks at Goole, for General Booth. Mr. Williams Dunford, architect, 101, Queen Victoria-street, London:—  
 J. W. Jackson, Goole ..... £410 10 0  
 Jackson Bros., Goole ..... 320 0 0  
 A. E. W. Shearnsmith, Swindon ..... 378 7 0  
 J. Walsh, Stockton ..... 378 0 0  
 F. Grant, Grimsby ..... 365 0 0  
 T. H. Barnett, Grimsby (accepted) ..... 358 0 0

**HARROGATE (Yorkshire).**—For alterations and additions at the Adelphi Hotel, Messrs. Motley & Laid, architects, 185, Earl's Court-road, London:—  
 Ives & Co., Shipley (accepted) ..... £1,105 0 0

**HARROW.**—For erecting two houses at Wealdstone, Mr. G. H. Basley. Mr. Johnson, architect:—  
 Waterman, Watford ..... £1,145 0 0  
 Dunkley, Willesden ..... 929 10 0  
 Barchenet, Wealdstone ..... 827 10 0  
 Gullett Bros., Wealdstone\* ..... 922 0 0  
 \* Accepted.

**HORNSEY.**—For furnaces, &c., for refuse treatment at the Hornsey Local Board's New Sanitary Depot, Hornsey. Mr. T. de Courcy Meade, Engineer:—  
 Piercy & Co., Birmingham ..... £8,850 0 0  
 W. Neil, Bow, E. .... 4,967 10 0  
 Crompton & Company, 18, Grace-street, E.C. .... 4,129 0 0  
 Wailes & Co., 258, Euston-road, N.W. .... 3,423 6 2  
 W. Horsfall, Leeds ..... 3,124 0 0  
 Whitford & Co., Millwall, E. .... 2,997 10 0  
 A. D. Darnay, London Bridge ..... 2,784 0 0  
 House, E.C. .... 2,784 0 0  
 Goudard, Massey & Warner, Nottingham (accepted) ..... 2,687 0 0

**HORNSEY.**—For levelling and making up Muswell-brook, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer:—  
 Dickson, St. Albans ..... £1,197 0 0  
 Aspinall & Sons, Finsbury-park ..... 1,050 0 0  
 Danmore, Grosvenor-street ..... 1,040 0 0  
 Mowlem & Co., Westminster ..... 987 0 0  
 Willmott & Sons, Hitchin ..... 962 0 0  
 Puzey, Hornsey ..... 933 0 0  
 Cooke & Co., Battersea ..... 914 0 0  
 Jackson & Son, Finsbury-park ..... 828 0 0  
 T. Adams, Kingsland ..... 814 0 0  
 A. Walker, Upper Holloway ..... 787 0 0  
 \* Accepted.



## CONTRACTS AND PUBLIC APPOINTMENT.

*Epitome of Advertisements in this Number*

## CONTRACTS

| Nature of Work, or Materials.             | By whom Required.                   | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------------|-------------------------------------|-----------------------------------|--------------------------|-------|
| British Rail Stone Paving                 | Southend Local Board                | P. Dodd                           | Mar. 19th                | ii.   |
| ing, Larpaving, &c.                       | Lewisham Bd. of Wks                 | Official                          | do.                      | ii.   |
| ual Contractors                           | do.                                 | do.                               | do.                      | ii.   |
| work Sewers, & North Woolwich             | Met. Bd. of Works                   | do.                               | do.                      | ii.   |
| se Houses, &c.                            | Liverpool Corporation               | G. F. Dacon                       | Mar. 22nd                | ii.   |
| terial Paving Works                       | West Ham Council                    | Lewis Angell                      | Mar. 26th                | ii.   |
| ten Contractors Granite                   | do.                                 | do.                               | do.                      | ii.   |
| ber for Packing Cases                     | Sec. of State for India             | Official                          | do.                      | xi.   |
| al Paving, Granite Kerb, Channelling, &c. | St. Mary (Battersea)                | do.                               | do.                      | xi.   |
| hardware Pipe Sewers, &c.                 | Vestry                              | J. T. Pilditch                    | do.                      | xi.   |
| on Granite and Stone Slabs                | West Bromwich Corp.                 | J. T. Bayrs                       | Mar. 27th                | ii.   |
| ery, Tenby                                | Ramsey Local Board                  | Official                          | Mar. 29th                | ii.   |
| estone Footway Pavements                  | Admiralty                           | do.                               | do.                      | ii.   |
|                                           | Birmingham Public Works Committee   | do.                               | do.                      | ii.   |
| Road and Culvert, Windsor.                | W. S. Tull                          | do.                               | Mar. 30th                | xi.   |
| in-up Rows                                | T. H. & Son                         | do.                               | do.                      | xi.   |
| ange Works at Schools                     | Beckenham Local Bd.                 | G. B. Carlton                     | Apr. 1st                 | ii.   |
| ing Bulb, & Electric                      | St. Marylebone Guar.                | H. S. C. & Son                    | do.                      | xi.   |
| Telegraphic                               | W. & W. J. Hy                       | do.                               | Apr. 3rd                 | ii.   |
| Steel Bridge, &c.                         | West Ham Council                    | Lewis Angell                      | Apr. 9th                 | xi.   |
|                                           | Portland Ferry Bridge Commissioners | do.                               | do.                      | xi.   |
| ch, South of London                       | Sir John Coode                      | do.                               | Apr. 13th                | xi.   |
| acks Buildings and Alterations            | J. Cubitt                           | do.                               | Not stated.              | xi.   |
| tion or Enlargement of Schools            | Salvation Army                      | J. W. Duxford                     | do.                      | xi.   |
| ital Repairs to Buildings and Furniture.  | School Bd. for London               | Official                          | do.                      | xi.   |
| ished Iron Dustbins                       | do.                                 | do.                               | do.                      | xi.   |
| airing and Cleaning various               | do.                                 | do.                               | do.                      | xi.   |
| cks and Materials, Chatham                | Schools, &c.                        | do.                               | do.                      | xi.   |
|                                           | War Department                      | do.                               | do.                      | xi.   |

## PUBLIC APPOINTMENT

| Nature of Appointment.   | By whom Advertised.   | Salary.             | Applications to be in. | Page. |
|--------------------------|-----------------------|---------------------|------------------------|-------|
| Mayor and Engineer ..... | Brentford Local Board | 200 <i>l.</i> ..... | Mar. 19th              | xvi.  |

|                                                     |    |    |    |               |  |
|-----------------------------------------------------|----|----|----|---------------|--|
| <b>RNSEY.</b> —For the supply and erection of about |    |    |    |               |  |
| of 4 ft. wrought-iron fencing, for the Hornsey      |    |    |    |               |  |
| Local Board. Mr. T. de Courcy Meade, Engineer :—    |    |    |    |               |  |
| Ailey & Grundy, Ambury-road, E.C. ....              | 1  | 8  | d. |               |  |
| Barnard, W., 17, St. John's-street, N. ....         | 1  | 1  | "  | per yard run! |  |
| B. Smith & Co., Glasgow .....                       | 10 | 0  | "  |               |  |
| Elwell, Birmingham .....                            | 8  | 8  | "  |               |  |
| Fryer Bros. & Co., 4, Upper                         |    |    |    |               |  |
| Hamme-street, E.C. ....                             | 7  | 10 | "  |               |  |
| Giles, Jones, & Baylis, 139 and                     |    |    |    |               |  |
| 41, Cannon-street, E.C. ....                        | 7  | 7  | "  |               |  |
| Hewitt, Chambers, & Co., near                       |    |    |    |               |  |
| Bedford .....                                       | 7  | 7  | "  |               |  |
| Rowe, Edmonton .....                                | 7  | 6  | "  |               |  |
| Mead, Massey, & Warner,                             |    |    |    |               |  |
| Higham .....                                        | 7  | 0  | "  |               |  |
| Pompe Fencing Co., 132, Mo-                         |    |    |    |               |  |
| nahan-street, E.C. ....                             | 6  | 10 | "  |               |  |
| Synon Bros., 6, Waterloo-place,                     |    |    |    |               |  |
| W.V. (accepted) .....                               | 5  | 9  | "  | !             |  |

|                                                     |     |   |   |  |  |
|-----------------------------------------------------|-----|---|---|--|--|
| <b>RNSEY.</b> —For brick culvert, &c., Middle-lane, |     |   |   |  |  |
| for the Hornsey Local Board. Mr. T. de Courcy       |     |   |   |  |  |
| Meade, Engineer :—                                  |     |   |   |  |  |
| Jackson & Sons, Finsbury-park .....                 | £49 | 0 | 0 |  |  |
| Coleman & Co., Battersea-Ck. ....                   | 441 | 0 | 0 |  |  |
| Pizzey, Hornsey .....                               | 417 | 0 | 0 |  |  |
| Dickson, St. Albans .....                           | 404 | 0 | 0 |  |  |
| Innamore, C. each-end .....                         | 405 | 0 | 0 |  |  |
| Adams & Sons, 10, St. Paul-street, E.C. ....        | 381 | 0 | 0 |  |  |
| Hillmott & Co., Hinchin (accepted) .....            | 353 | 0 | 0 |  |  |

RNSEY.—For brick culvert, &c., Middle-lane,  
 for the Hornsey Local Board. Mr. T. de Courcy  
 & Co., Engineer:—

|                                    |      |   |   |
|------------------------------------|------|---|---|
| Jackson & Sons, Finsbury-park..... | £449 | 0 | 0 |
| de Cocke & Co., Battersea .....    | 441  | 0 | 0 |
| de Pizze, Hornsey .....            | 414  | 0 | 0 |
| Jackson, St. Albans .....          | 407  | 0 | 0 |
| Emmure, C.ouch-end .....           | 405  | 0 | 0 |
| Adams Kinsland .....               | 381  | 0 | 0 |
| Hillmot & Sons, Hitchin (accepted) | 353  | 0 | 0 |

|                                                |                                   |        |           |
|------------------------------------------------|-----------------------------------|--------|-----------|
| NBSKY.—For various works for the Hornsey Local |                                   |        |           |
| for one year, from March 26, 1889. Mr. T. de   |                                   |        |           |
| made Engineer                                  | Nature of Contract.               |        |           |
| name and Address                               |                                   |        |           |
| Accepted Contractor.                           |                                   |        |           |
| to, Highgate .....                             | Repairing picks, &c. ....         | At per | Schedule. |
| to, Moulwell Hill                              |                                   |        |           |
| Wright, Mile-End,                              | Ironwork .....                    | Do.    |           |
| Town .....                                     | Stand-post work .....             | 24     | 15. 6d.   |
| and Sons, Ball's Pond                          | Pits .....                        | each.  |           |
| Chesham, Chesham                               | Street Watering and General       | At per | Schedule. |
| and Co., Wood Green                            | Scavenging and Dusting .....      |        | £909.     |
| and Sons, Finsbury                             | Scavenging and Dusting .....      |        | £946.     |
| and Co., Wood Green                            | Street cleaning .....             |        |           |
| to, to a committee for consideration.          | to a committee for consideration. |        |           |

38WEAR (Devon).—For additions and alterations  
View Villa, Kingwear, for Mr. Charles Seale  
M.P. Mr. E. H. Back, architect. Quasitates by  
St. :  
oley & Grant, Dartmouth ..... £659 0 0  
lar & Sons, Dartmouth ..... 685 0 0  
under & Veale, Dartmouth ..... 668 0 0  
W. Vanstone,\* Paignton ..... 628 0 0  
\* Accepted.

|                                                                                                                                                                         |      |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|
| <p>ISHAM. — For improvements at the "Bir David<br/>         " tavern, Court Hill road, Lewisham. Mr.<br/>         ewcock, architect, 88, Bishopsgate-street Within,</p> |      |     |
| Sham Brothers.....                                                                                                                                                      | £275 | 0 0 |
| ry .....                                                                                                                                                                | 233  | 0 0 |
| near & Co. ....                                                                                                                                                         | 220  | 0 0 |
| henson .....                                                                                                                                                            | 169  | 0 0 |
| es .....                                                                                                                                                                | 163  | 0 0 |
| mpion .....                                                                                                                                                             | 158  | 0 0 |
| n .....                                                                                                                                                                 | 155  | 0 0 |

|        |      |    |   |
|--------|------|----|---|
| holder | £405 | 0  | 0 |
| nt     | 321  | 0  | 0 |
| nt     | 295  | 12 | 0 |
| nt     | 293  | 0  | 0 |

|                       | Club.  | Arch.  |        |
|-----------------------|--------|--------|--------|
| Masley                | £2,436 | £2,382 | £2,818 |
| Balaam Bros.          | 2,305  | 345    | 2,650  |
| Sawyer                | 2,341  | 299    | 2,647  |
| Petman & Fotheringham | 2,309  | 270    | 2,579  |
| Isk-ran & Todd        | 2,179  | 345    | 2,524  |
| Woodward              | 2,168  | 225    | 2,485  |
| Burnan Bros.          | 2,000  | 270    | 2,270  |
| W. Downs              | 2,110  | 270    | 2,380  |
| J. & J. Greenwood     | 2,111  | 248    | 2,360  |

LONDON.—For the erection of Wesleyan Mission Hall at Stratham, S.W. Mr. Frederick Wheeler, architect, 22, Chancery-lane, W.C. Quantities by M<sup>rs</sup>s. Evans & Deacon, 1, Adelaide-street, Charing-cross, S.W. :-

|                        |        |   |   |
|------------------------|--------|---|---|
| Hill Bros. ....        | £1,185 | 0 | 0 |
| W. Thomas .....        | 1,171  | 0 | 0 |
| G. Jervis Smith .....  | 1,140  | 0 | 0 |
| F. & H. F. BIGGS ..... | 1,130  | 0 | 0 |
| J. Holloway* .....     | 1,098  | 0 | 0 |

\* Accepted subject to reduction.

LONDON.—For alterations and additions to No. 96,  
Upper-street, Islington. Mr. Edmund J. Harrison, archi-  
tect, 72, Chancery-lane, W.C. :—

|                      |           |
|----------------------|-----------|
| L. Fullbrook         | £578 10 0 |
| T. Andrew            | 438 0 0   |
| Wall Bros.           | 429 0 0   |
| D. Davies (late)     | 383 18 0  |
| H. Baylis (accepted) | 348 10 0  |

LONDON.—For sundry repairs and decoration at the addresses named. Mr. Edwin T. Hall, architect, 57, Moor-ate-street, E.C. :—

|                                   |      |      |
|-----------------------------------|------|------|
| 54, Finsbury-pavement.            |      |      |
| Heaps .....                       | £530 | 0 0  |
| Woodward (accepted) .....         | 452  | 0 0  |
| 136, High-street, Notting Hall.   |      |      |
| Pearson .....                     | 270  | 0 0  |
| Adams (accepted) .....            | 191  | 11 0 |
| 5, Stanhope-place, W.             |      |      |
| Bartholomew & Co. ....            | 294  | 0 0  |
| Foster & Dicksee (accepted) ..... | 223  | 0 0  |

LONDON.—For the erection of five shops at Lavender-hill, S.W. Mr. Frederick Wheeler, architect, 22, Chancery-lane, W.C.:—

|                                  |        |   |   |
|----------------------------------|--------|---|---|
| J. Holloway .....                | £4,870 | 0 | 0 |
| J. E. J. Thorpe.....             | 3,870  | 0 | 0 |
| Scott & Deryck .....             | 3,750  | 0 | 0 |
| G. Jervis Smith (accepted) ..... | 3,570  | 0 | 0 |

LONDON.—For the construction of roads and sewers, Prince's Estate, Battersea, S.W. Mr. Frederick Wheeler, Architect, 22, Chancery-lane, W.C. :—

|                             |        | Without Carb. |
|-----------------------------|--------|---------------|
| J. Neal .....               | £1,575 | £1,292        |
| R. & G. Neal, Limited ..... | 1,474  | 1,243         |
| T. Blockmore .....          | 1,420  | 1,201         |
| R. Mayo (accepted) .....    | 1,345  | 1,100         |

LONDON.—For fitting up two floors of premises at the corner of Denman-street, Shaftesbury-avenue, for trade purposes. Messrs. N. S. Joseph & Smithem, 45, Finsbury-avenue, architects:—

|                         |        |   |   |
|-------------------------|--------|---|---|
| W. Scrivener & Co. .... | £1,182 | 0 | 0 |
| M. Patrick & Son .....  | 1,094  | 0 | 0 |
| G. Colls .....          | 1,040  | 0 | 0 |

LONDON.—For rebuilding Nos. 9 and 10, Nicholl-square, E.C. Messrs. N. S. Joseph & Smithem, 45, Finsbury-pavement, architects:—

|                             |        |   |   |
|-----------------------------|--------|---|---|
| G. S. Williams & Son .....  | £2,428 | 0 | 0 |
| Asby Bros. ....             | 2,411  | 0 | 0 |
| Patman & Fotheringham ..... | 2,173  | 0 | 0 |

LONDON. — For sanitary alterations and decorating work at No. 11, Eaton-square, Pimlico, for Mr. H. Gatliff. Mr. Newmarch, surveyor. Quantities supplied.

|                       |      |   |   |
|-----------------------|------|---|---|
| Brewer                | 2998 | 0 | 0 |
| Patman & Fotheringham | 963  | 0 | 0 |
| Lawrence              | 884  | 0 | 0 |
| Bush                  | 883  | 0 | 0 |
| N. Lidstone           | 835  | 0 | 0 |

LONDON.—For alterations and additions at No. 8, Kensington Park-road, W., for Dr. W. M. Nott, Mr. Newmarch, surveyor. Quantities supplied:—

|                       |      |   |   |
|-----------------------|------|---|---|
| Patman & Fotheringham | 4825 | 0 | 0 |
| Lawrence              | 718  | 0 | 0 |
| N. Lidstone           | 705  | 0 | 0 |
| Brewer                | 696  | 0 | 0 |
| Dowsing               | 675  | 0 | 0 |

LONDON.—For warming the school in Horseferry-road, Westminster, on the low-pressure hot-water system, for the School Board for London. Mr. T. J. Bailey, architect:—

Robert Crane (accepted) ..... £300 0 0  
[Full list given in last week's *Builder*, p. 194.]

LONDON.—For general repairs, decorating, and new drainage at No. 3, Nevcrn-road, Earl's Court, W., for Mr. A. J. Hamilton. Mr. Edgar H. Selby, architect and surveyor, 26, Craven-street, Charing-cross, W.C. :—  
T. W. Heath. £395 12 3

|                               |     |   |   |
|-------------------------------|-----|---|---|
| J. Rugg .....                 | 244 | 0 | 0 |
| R. Eddie .....                | 231 | 3 | 0 |
| Toten & Sons (accepted) ..... | 227 | 0 | 0 |

LONDON.—For fitting offices at 219, Upper Thames-street, and 99, Queen Victoria-street, the same being an extension of the International Headquarters of the Salvation Army, for General Booth. Mr. J. Williams Dunford, architect, 101, Queen Victoria-street, E.C. 4.

LONDON. — For improvements at "The Talbot" tavern, Clarendon-road, Notting-hill. Mr. R. A. Lewcock, architect, 88, Bishopgate-street Within, E.C. —

|                           |      |   |   |
|---------------------------|------|---|---|
| A. Davies (accepted)..... | £245 | 0 | 0 |
| <i>Peutering.</i>         |      |   |   |
| S. Heath (accepted).....  | 124  | 0 | 0 |

LONDON.—For improvements at "The Duke of York" Tavern, Salmon's-lane, Stepney. Mr. R. A. Lewcock, architect, 89, Bishopsgate-street-within, E.C.:—  
G. Stephenson (accepted)..... 2548 0 0

LONDON.—For works at "The Sun Dial," Goswell-road, E.C. Mr. R. A. Lewcock, architect, 88, Bishops-gate-street-within, E.C.:—

|                    |      |   |   |
|--------------------|------|---|---|
| Spencer & Co. .... | £240 | 0 | 0 |
| Hunt ..... ..      | 225  | 0 | 0 |
| Balsam Bros. ....  | 211  | 0 | 0 |
| Ivory ..... ..     | 210  | 0 | 0 |

MANCHESTER.—For erecting Davyhulme Church—Manchester. Mr. George Truefitt, architect, 5, Bloomsbury-square, London.—

|                                 | Church Complete. | A*         |
|---------------------------------|------------------|------------|
| Rowbotham.....                  | £5,300 0 0       | £4,400 0 0 |
| Haywood.....                    | 4,697 14 4       | 4,095 8 0  |
| Brown & Son.....                | 4,400 0 0        | 3,820 0 0  |
| Neill & Son.....                | 4,210 0 0        | 3,737 0 0  |
| Hamilton.....                   | 3,320 0 0        | 3,720 0 0  |
| Wilson, Toft, &<br>Huntley..... | 3,969 0 0        | 3,529 0 0  |
| Southern & Sons.....            | 3,920 0 0        | 3,470 0 0  |

\* If internal walls are finished stucco instead of with

stone.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| MANCHESTER.—For alterations and additions to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| Mlration Army Temple, Grosvenor-street, Manchester,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| General Beeth. Mr. J. Williams Dunford, architect,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 82 |  |

**MIDDLEWICH (Cheshire).—**For the erection and completion of Salvation Army Barracks buildings, at Middlewich, Cheshire, for General Booth, Mr. J. Williams, architect, 101, Queen Victoria-street, London:—

|                                   |     |    |   |
|-----------------------------------|-----|----|---|
| Mitchelburn & Wright, Crews ..... | 265 | 0  | 0 |
| Hayes, Warrington .....           | 245 | 0  | 0 |
| Martin, Battersea .....           | 640 | 0  | 0 |
| Cotterill, Crews .....            | 574 | 12 | 6 |
| Beckett, Harford .....            | 587 | 0  | 0 |
| Rylance & Taylor, Northwich ..... | 564 | 10 | 0 |
| Stelfox, Northwich .....          | 600 | 0  | 0 |
| Mellor, Sandbach .....            | 488 | 10 | 0 |
| Matthews, Nantwich .....          | 485 | 0  | 0 |
| Coxhead, Leytonstone .....        | 473 | 0  | 0 |
| Clarke & Son, Middlewich .....    | 470 | 0  | 0 |
| Hamlet & Son, Winsford .....      | 459 | 10 | 0 |

**MAIDENHEAD (Berks).—**For the erection of a residence and stabling, Maidenhead Court Estate. Mr. Frederick Wheeler, architect, 22, Chancery-lane, London. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street

|                            |        |   |   |
|----------------------------|--------|---|---|
| Dringcross, S. W. :-       |        |   |   |
| Luscombe & Son .....       | £7,400 | 0 | 0 |
| Goddard .....              | 6,050  | 0 | 0 |
| Poster & Dicksee .....     | 5,995  | 0 | 0 |
| Maides & Harper .....      | 5,978  | 0 | 0 |
| J. Freeman .....           | 5,820  | 0 | 0 |
| J. Shillitoe & Son .....   | 5,475  | 0 | 0 |
| G. Jarvis Smith .....      | 5,298  | 0 |   |
| T. Nye .....               | 4,995  | 0 | 0 |
| G. H. Gibson, (secretary). | 4,943  |   |   |

**MAIDENHEAD (Berks).**—For the erection of billiard room, &c., to Maidenhead Court Estate. Mr. Frederick Wheeler, architect, 25, Chancery-lane, London.—  
G. H. Gibson, High Wycombe\*.....£347 10 0  
\*Accepted.

**PLUMSTEAD (Kent).**—For erection of brick boundary and retaining walls, iron and oak fencing to enclose land intended to be used as a cemetery for the parish of Plumstead. Mr. Henry H. Church, architect, Woolwich. Quantities supplied:—

|                                       |            |
|---------------------------------------|------------|
| Co-operative Builders' Society (Lim.) | £3,460 0 0 |
| Kirk & Randall                        | 3,300 0 0  |
| Caplin & Redgrave                     | 5,188 0 0  |
| Staines & Son                         | 3,154 0 0  |
| Rackham & Bentham                     | 3,134 0 0  |
| King Brothers & Co.                   | 3,068 0 0  |
| Battley                               | 2,962 0 0  |
| Potter                                | 2,980 0 0  |

**PLUMSTEAD (Kent).**—For sewers in the Strand Field, High-street, Plumstead. Mr. Henry H. Church, architect, Woolwich:—

|                           |          |
|---------------------------|----------|
| Civil                     | £205 0 0 |
| Coombs                    | 185 0 0  |
| Rackham & Bentham         | 174 14 8 |
| For side Entrances, each. |          |
| Coombs                    | £80 0 0  |
| Civil                     | 55 0 0   |
| Rackham & Bentham         | 43 18 0  |

**SEVENOAKS.**—For the erection of a club-house and large hall for the Directors of the Sevenoaks Constitutional Club Company, limited. Mr. T. Potter, architect, Sevenoaks. Quantities supplied:—

|                                    | Club.  | Hall.  | Drainage. | Total. |
|------------------------------------|--------|--------|-----------|--------|
|                                    | £.     | £.     | £.        | £.     |
| Langdale, Hallett, & Co., London   | 3,092  | 2,150  | 645       | 5,887  |
| E. Bevan, Sevenoaks                | 2,650* | 1,618* | 572*      | 4,740* |
| Maides & Harper, Croydon           | 2,498  | 1,597  | 559       | 4,654  |
| Fryer & Co., Maidstone             | 2,465  | 1,480  | 551       | 4,496  |
| Arsnauld & Son, Bromley            | 2,365  | 1,427  | 544       | 4,336  |
| R. Darnell, Brasted                | 2,260  | 1,140  | 510       | 4,200  |
| Wallis & Sons, Maidstone           | 2,190  | 1,390  | 512       | 4,082  |
| W. Wiltshire, Sevenoaks (accepted) | 2,179  | 1,328  | 487       | 3,994  |

\* Add 4s. 6d. + Add 1s. 7d. + Add 8s. 9d. + Add 10d.  
[The above estimates do not include heating or terra-cotta dressings.]

**SHIRLEY (near Croydon).**—For erecting village club, for the Rev W. Wilks, M.A. Messrs. St. Aubyn & Wadling, architects:—  
Smith & Bullock, West Croydon.....£650  
\*Accepted revised tender.

**STREATHAM.**—For building three shops, for Mr. R. L. Freeborn:—  
Walker Francis, Dulwich (accepted) £2,250 0 0

**WOLVERHAMPTON.**—For the erection of eight cottage homes, schools, storerooms, superintendents' residence and office, entrance lodge, workshops, roads, &c., at Wednesfield, near Wolverhampton, for the Guardians of the Wolverhampton Union. Mr. Geo. H. Stanger, North-street, Wolverhampton, architect. Quantities supplied by the architect:—

|                                    |             |
|------------------------------------|-------------|
| J. Shillito & Son, Bury St. Edm.   | £20,000 0 0 |
| J. Inwood, Malvern                 | 19,505 0 0  |
| J. Biggs, Hockley, Birmingham      | 18,000 0 0  |
| Wm. Willets, Old Hill, near Dudley | 17,957 0 0  |
| B. Guest, Wolverhampton            | 17,811 0 0  |
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| C. A. Horton, Brierley Hill        | 17,263 0 0  |
| Wm. Bissett & Sons, Sheffield      | 17,009 0 0  |
| Lovatt & Co., Wolverhampton        | 16,312 0 0  |
| Hy. Willcock, Wolverhampton        | 16,020 0 0  |
| E. Gabbett, Liverpool              | 15,709 0 0  |
| J. Jones & Sons, Wolverhampton     | 15,400 0 0  |
| J. Bradley & Co., W. Wolverhampton | 14,691 0 0  |

[Architect's estimate, £15,622.]  
\*Accepted.

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# The Builder.

Vol. LVI. No. 247.

SATURDAY, MARCH 23, 1895.

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| Parsonage, Church of the Good Shepherd, Hampstead.—Mr. James Brooks, Architect                | Single-Page Photo-Litho.         |
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### Provisional Amounts in Contracts.

**T**HE paper on this subject recently read by Mr. Randall at the Institute of Builders, and of which an abstract appeared in our last (page 201, ante) affords a curious indication of the extent to which architecture and building, instead of representing (as they once were generally supposed to represent) the art of design and the science of construction, are more and more becoming a mere business for producing buildings, as money-earning property, in the shortest possible time and in the cheapest manner. In the system of conducting work referred to by Mr. Randall in his paper, all consideration of architecture in the true sense of the word seems to have gone to the winds. The architect is no longer a designer in the true sense, he is an agent for developing building property, a wire-puller who brings various trading firms into action for the specified end. The "builder," as he once actually was and is still by courtesy called, has become solely a "contractor" and nothing else, and knows little or nothing personally of the building he is to assist in putting together. In speaking recently of the modern position of the quantity surveyor, we referred to the extraordinary change which this system has brought about in the relation of the builder to the actual execution of the work, when, instead of studying and knowing the building which he undertakes to carry out, he sees a schedule of quantities and prices, and perhaps just glances at the drawings. This is not the principle on which to ensure the best building. But Mr. Randall's paper drew attention to the fact that the contractor on this system has not even the control of all the work supplied in his hands. A sum for instance, is specified for ironwork, but all the builder knows is that he is to unload and fix so many tons of constructional ironwork. This, again, is not the way to ensure good building. The practical director of the building should have control over the whole, and know all that is being done. The nominal "builder" has, however, nearly ceased to be the practical director of the construction. The person who is really most so at present is the clerk of works, if he is a good man with knowledge of his work and power to enforce

attention. Nor is it, apparently, Mr. Randall's special complaint that the builder has not control over the details of the ironwork. It is rather that he has not control over the date of its delivery. That is obviously the essence of the grievance. The specialist who produces the ironwork has no connexion with the contractor beyond the fact that the latter has to sign the order for the delivery of the work. Beyond that, the "selected person" who supplies the ironwork is often "most independent," as we can well believe. He will only supply it in the manner and at the time convenient to himself, and the contractor experiences delay which injures him both in pocket and in reputation. The same thing is the case with terra-cotta, where the delays are even more vexatious, though as a matter of fact they are often quite unavoidable, owing to the conditions of the production of the material. Mr. Randall says that after many years' experience he can only recollect one instance in which terra-cotta was supplied to the stipulated time; which we can well believe. The terra-cotta has to be modelled from detailed drawings with an allowance for shrinkage; a kind of detail drawing which requires much care and consideration, which is not entered on till after the contract is signed, and then there is the time for modelling to be allowed, and after that all the possible delays and occasional risks in firing: so that we cannot wonder that Mr. Randall should recommend contractors to be very cautious about having anything to do with terra-cotta in cases where time is of the essence of the contract.

The suggested remedies for these difficulties are of course all made from the contractors' side of the question, but they are worth consideration by architects. The ironwork difficulty Mr. Randall considers to arise from the fact that architects do not receive the same education as an engineer in regard to ironwork, and consequently rely on the ironwork specialist to make the drawings for them. He thinks these should be made in the architect's office, so that builders when tendering can see the nature and special difficulties of the work they are undertaking. Mr. Randall evidently refers to cases where the firm who supply the ironwork make their own drawings; but that is not always the case, even when the architect himself does not make them; Mr. Randall confounds two kinds of specialist. Some architects who do not trust themselves to make their own ironwork details, when the ironwork is of an

important and complicated character (as in the case of a large-span iron roof), place these in the hands of an engineer, which is quite a different thing from leaving them to the ironfounder's draughtsman. The drawings are then as available as if made in the architect's office, so that the mischief is not entirely chargeable to the architect's ignorance of iron detail (supposing that proved); it is due to the bad system of having no drawings of the ironwork prepared on the architect's responsibility, — leaving it all to be done in the ironfoundry, in fact. It is quite true that few architects have studied ironwork systematically, and it is to be regretted; but if they engage an engineer to make the details of this part of the work it is (or may be) the same thing as far as the contractor is concerned; the drawings can be seen in the architect's office, the work can be included in the quantities, and the order can go through the contractor and leave him with the control of the ironfounder, which he ought to have. The position in that case is in fact simply that the architect enters into temporary partnership with an engineer. Of course some one has to pay the consulting engineer's fee, and there is no doubt the architect ought to pay that (and generally does). It is paid for knowledge which, in these days of iron, the architect ought to have himself, and ought to supply at all events at his own cost. This consideration, however, is probably the reason why the whole thing is sometimes turned over to the founder, who will arrange the details without making a special charge for it: he is to supply so much ironwork, and does it in his own way. Apart from the question whether this is the way to get the most scientifically-designed ironwork, we quite concur with Mr. Randall that it is a system very unfair to the contractor, who has to complete the building by a specified time, and depends on the delivery of ironwork over which he has no kind of control, and of the difficulties of fixing which he knows nothing until it comes upon the ground.

Terra-cotta is rather a different matter. Terra-cotta manufacturers tell the contractor they can give him no date for delivery until they have all the details before them. Thereupon the contractor, as represented by Mr. Randall at least, thinks the architect should have all the details ready before the signing of the contract. And supposing the tenders come much higher than the building owner expects, and the building is indefinitely postponed? The architect then will have done



a quantity of detail work for which according to the usual professional custom he will not be able to charge. The architect would hardly care to undertake that work at that juncture unless he first had a special understanding with his client about it. Mr. Randall has another proposition which is peculiarly a builder's view of the matter, viz., that the architect should say to the terra-cotta makers, "Here are the drawings, you know the nature of your own material best, make the working drawings and submit them for my approval." This Mr. Randall thinks is "a common-sense thing to do"; a remark which only shows how entirely incapable builders often are of understanding the true nature of architectural work. It is exactly in the refinements of detail that the true architect's hand is most distinctly shewn, and no architect who had an artist's interest in his work would listen to such a proposition for a moment. If people will build in a hurry and employ terra-cotta, the only way out of the difficulty is for the architect to say to his client, "If this work is to be carried out in the time you wish, the terra-cotta details must be prepared in advance to be ready at the signing of the contract, and in that case I must be indemnified for the work on them, in addition to the usual charge for drawings and specifications, in case of the building not being carried out." Without such an understanding the architect would run the risk of being victimised, instead of the contractor.

With much of what Mr. Randall says as to the inconvenience of specifying particular firms to do special work, and leaving them practically out of the control of the contractor, we quite agree; but the same cause, hurry in building, is at the bottom of it all. Mr. Randall thinks the architect should specify details as to warming and lighting, &c., so that they can be estimated in the quantities and carried out under the supervision of the contractor, who can then arrange the time and method of doing such work in accordance with the progress of the main building, instead of having independent firms coming in and cutting his work about just when it suits their convenience. Of course this is much more convenient for the contractor and better for the proper carrying out of the whole building; but then in these cases of building against time the architect is hurried as much as anyone else; the due consideration of such details means extra time and thought before the estimate is made and the contract is signed; and under the existing state of things all these claims really mean that the architect is to take a great deal of extra trouble to save the contractor from trouble.

The moral of the whole matter is that no really satisfactory architecture or building can be done under a system of hurry. In a great many cases, especially in London, architectural practice and building operations now mean, practically, the exploitation of buildings which are to give a money return in the shortest possible time and at the lowest possible price. The only financial argument which can be brought to bear against this (for those who will listen only to financial arguments) is, that a building on which more leisure and thought is bestowed while in construction will almost certainly be a better investment for its owner in the long run. They who make haste to be rich fall into a snare—in building as in other matters; and perhaps some day it will be discovered that to set a number of different agents to scramble a building up in a hurry, each working for his own hand, though it may answer the immediate purpose, is not the way to produce a property that will be of great ultimate value to the building owner's "heirs, executors, and assigns;" as, from a higher point of view, it is certainly not the way to produce, in the first instance, either noble architecture or sound building.

**Another New London Theatre.**—It is stated that still another new theatre is projected for London, the site of which is to be in Piccadilly.

### THE SCIENTIFIC WORKS OF SIR WILLIAM SIEMENS.

IN the notice of Dr. Pole's "Life of Sir William Siemens," which appeared in our columns on the 10th of November last, we said little about Sir William's literary work, knowing, by an announcement made in the preface, that we should before long have an opportunity of calling attention to it more specially. The three handsome volumes which have just appeared,\* as a sequel to the biography, give us this opportunity.

The gift of writing clearly does not always accompany scientific knowledge or technical skill; and instances are by no means uncommon where men, very eminent in certain subjects, have shown to considerable disadvantage when they have been required to write about them. This was not so with Sir William Siemens, and in the estimate of his character offered by his biographer, his ability in this respect is noticed in the following terms:—

"He had one qualification which is not very common among hard mechanical workers, i.e., considerable literary power, of which he took full advantage. He was an admirably clear writer; and, although a foreigner born, he acquired a knowledge of English, and an ability of using it, very remarkable, as is shown by the many excellent papers he contributed to the scientific societies in this country, and the many other able documents that came from his pen."

It was natural that Sir William, having taken great pains with these writings, should desire a wider circulation for them than could be obtained in the transactions of the societies they were delivered to; and, indeed, many of them were never printed at all in that way. He, therefore, in his will, expressed the wish that they should be published in a collected form. His executors have carried out this wish, entrusting the task of editing them to Mr. E. F. Bamber, who had been Sir William's secretary for the last ten years of his life. Mr. Bamber had done a somewhat similar duty in regard to the posthumous works of the late Professor Rankine, and in both cases the work has been done well.

The first thing that strikes us is the immense amount of literary matter that Sir William produced. Few people had any idea that, in the midst of such a busy life of practical work, he could have found time for such an extent of literary labour. The three volumes contain, in either written or spoken matter, no less than 175 articles, occupying 1,337 large octavo closely-printed pages. And when it is considered that most of these articles were of a nature to require considerable study, and that many had to be illustrated by elaborate drawings, which he must either have made or directed, one is amazed at the quantity of work of which he was capable.

The papers are well arranged, according to their subjects. The first volume contains those referring to Heat and Metallurgy; the second those on Electricity and miscellaneous subjects; and the third volume is devoted to Addresses and Lectures, of which there are a great many. For it must be added that Sir William Siemens was not only a clear writer, but an able speaker. Dr. Pole, in his biography, says on this point:—

"He was also a good lecturer, and his command of English was almost as perfect in speaking as in writing. The author of this memoir has frequently had occasion to notice, when hearing him speak without any preparation, that, although he had not altogether what might be called a fluent delivery, his choice of words and mode of expression were such as could hardly be improved. He would sometimes hesitate for a moment, as if at a loss for a word, but the word he chose was always the right one."

This last remark is very significant. Some one, praising Fox, complimented him on his "never being at a loss for a word." "That may be," answered he; "but my opponent is

never at a loss for the right word." And the choice of the right word, particularly in a technical or scientific matter, argues a great deal as to the speaker's knowledge and mental power.

His first public appearance was at the Society of Arts, on May 30, 1849, when he showed and explained an "Improved Electric Telegraph," invented by his brother, Mr. Werner Siemens, of Berlin. The communication was not published, but it was entered in the minutes of the Society, and is now printed by their permission. A year later he explained, at the same place, his own new regenerative condenser, which produced such a favourable impression that the Society awarded him their gold medal.

It is interesting to note, in connexion with this, that the last paper printed in the series is a rough sketch written on November 8, 1853, of an address which he intended to deliver on the 21st of that month as Chairman of the Council of the same society. But when the day came, the sad announcement of his death, two days previously, had to be made.

The first paper which attracted general attention, as showing special scientific ability, was one read to the Institution of Civil Engineers, in 1852, on the "Conversion of Heat into Mechanical Effort." It discussed ably the principles of thermo-dynamics, which were but little known then, but have since played such an important part in regard to prime movers; and it defended successfully, against some strong opponents, his own views as to this novel application of heat, which afterwards proved so successful and valuable.

In 1854, he laid before the Institution of Mechanical Engineers the description of his water-meter, the first of his inventions which was a complete success, financially as well as technically. In a compact space, not much larger than a quart bottle, this little meter contained devices of wonderful ingenuity and efficiency; and indeed now, after a lapse of nearly half-a-century, it remains unaltered as the most perfect and popular instrument of the kind known.

The first account of the regenerative furnace, which was to revolutionise the metallurgical world, was published by him in 1857. In the very outset of this paper he took great pains to attribute the invention to his brother Frederick, modestly adding, "it has been matured and variously applied by the writer within the last few months."

The first description of this furnace for the Siemens process of steel-making was read in 1868 before the Chemical Society; for he laid so much stress on the chemical aspects of this invention that he wished to get it fully discussed by the adepts he would meet there. The result, it need hardly now be said, was very favourable to him.

In 1882 he presented to the Royal Society his paper on "The Conservation of the Solar Energy." He endeavoured to show that the sun had a peculiar action by which, after the calorific energy was radiated out into space, the materials of it were gathered up and used over again. The paper was the result of great study, and made much sensation in scientific circles as a daring and clever hypothesis. The subject involved very difficult considerations, and, although the conclusion was not generally accepted, the novelty and merit of the investigation were allowed on all hands.

This was Sir William's last scientific paper of any importance. During the few months remaining of his earthly career he reverted to more practical subjects, and when seized by his last illness he was engaged in experiments tending to bring down his great furnace invention to the common uses of every-day industry; but of these, unfortunately, no records remain.

The volume of "Addresses and Lectures" contains many addresses to societies in which he filled the office of President, including that to the British Association at Southampton in 1882, and one (in French) given to the "Société des Ingénieurs Civils," in Paris, in 1881. There are, however, others

\* "The Scientific Works of C. William Siemens, Kt., F.R.S. A Collection of Papers and Discussions." Edited by E. F. Bamber, Civil Engineer. Three vols. London: John Murray, 1889.



of a more popular kind. He was always ready to lend his aid to institutions connected in any way with education; and many lectures and addresses given in this way have been preserved, notably one at Birmingham, republished under the title of "Science and Industry," and one under the singular but comprehensive title of "Waste" at Coventry.

In 1866 he presided at a large gathering of 300 persons as an "Abschiedsfeier" to Professor Gottfried Kinkel, and his long address, given in German, manifests a good deal of sympathy and feeling, which the more formal scientific and technical writings gave no occasion for.

His last lecture, given at the Electric Exhibition, in Vienna, three months before his death, was also in German; but it does not appear to have been preserved, as it is not included in this collection.

In 1874 he delivered a lecture at the Royal Institution of Great Britain, giving a description of the large steam vessel designed by himself for laying submarine cables across the Atlantic. The fact of his having named this vessel the *Faraday*, in honour of the great man whose voice had so often resounded within those walls, gave the lecture unwonted interest, and created great enthusiasm. He gave other "Friday Evening Lectures" at this institution, when he took care to show that he had the power of presenting those pleasant, and easy, and prettily-illustrated views of scientific truth which render science so popular in that locality.

A feature has been added to these volumes which was probably not contemplated by Sir William himself, namely, a reprint of his more important remarks made in discussions at the various scientific societies. This is an important addition, and the editor, in finding out and selecting these remarks, has done a work of great labour with good judgment. They are not only always interesting and *à propos*, but they illustrate well the character of the man. Although he spoke very often, and on all sorts of subjects, one could see his object was, never simply to assert himself, but always to add something to the knowledge of the subject in question. He had always really something to say (which is by no means a universal feature, either in scientific or general discussions), and he always said it clearly and temperately. He had often, of course, to express disagreement with the views of others, but he always did this in a way so courteous that no one could be offended or hurt at his criticisms; and when commendation was deserved he gave it not grudgingly.

In these discussions Sir William sometimes allowed himself a little departure from the orthodox severity of science, and now and then little flashes of his pleasant nature appear. In speaking of the application of steel for shipbuilding, at the Institute of Naval Architects, and comparing it with the use of the rougher material, iron, he said:—

"If you ride a common cart-horse you may go to sleep on him, but if you are on a fine-spirited animal, all your wits must be about you, or you may be landed in a ditch. . . . Now, should we shrink from using a material because intelligence is required in working and using it? Surely that would be a very poor compliment to this age of progress!"

Referring to some chemist's criticism, he said, with very good humour:—

"The author had attempted to find out results without the chemist; but the chemist nowadays could put his finger into everything. If we called a thing iron, the chemist would call it a mixture of iron, phosphorus, sulphur, silicon, and other earthy materials, and it was useless to try to do without him."

In a discussion at the Society of Arts on the Patent Laws, alluding to the differences of opinion that had been expressed, he said:—

"He had been reminded of a fable that Jupiter one time, when there were only a few people in the world, thought that as he had heard so much rumbling about the weather, he would give each of them the option of fixing his own. Accordingly, he agriculturalist, the grazier, the miller, and the potter met in order to debate what weather would suit them best. The potter thought it was out of the question to have a shower nearly every day, which suited the grazier; the grazier thought a long

drought, such as the agriculturalist required, was most detrimental; and the miller said unless he had a deluge every week, his water-power could not be kept up. The case before them was almost parallel to this."

In 1882, when the military objections to the Channel Tunnel were under discussion, Dr. Siemens suggested a safety-measure for suffocating the French troops with a sudden irruption of carbonic acid gas. On this, Professor Tyndall wrote to the *Times* pledging his word that Dr. Siemens could in a few minutes show half a dozen ways in which his proposed asphyxiation might be comfortably evaded. Dr. Siemens's reply, written in perfect good temper, is given in these volumes; but the little skirmish of the two great scientists added something to the fun of the tunnel-joke generally.

We must say, in conclusion, that, although many of the essays and discussions in these volumes treat of matters that were passing at the time, yet, as they refer largely to inventions and operations the effects of which still remain, they have a historical interest; and, indeed, many of the facts stated and opinions expressed are of permanent value. This is enhanced by a carefully-prepared indexing that renders reference to them easy; and, in any case, the collection, combined with the biography previously published, will form for posterity a fitting memorial of an eminent and worthy man.

# NOTES.

THE sudden demise of the Metropolitan Board of Works, ten days before "the appointed day" for its natural death, will cause little surprise and less regret. We commented last week on the tone of the answer given in the House of Lords by the late Board's Chairman, Lord Magheramorne, when questioned about some of the Board's proceedings. The same magnificent tone was adopted by the Board's spokesman in the House of Commons, the Hon. Alan de Tatton Egerton, who said that "the attitude of the Board" in regard to certain matters was that "it would do its duty." It was evident when the Board met on Friday in last week that the majority meant to assert their authority, which, brief as would otherwise have been its duration, has been met with untimely abbreviation, or rather extinction. At the last moment, the Board determined to pose as the friend of the "long-suffering people of the East-end of London," and there were present a couple of deputations from the local vestries who urged the Board to "keep its memory green" by entering upon the work of constructing the Blackwall Tunnel, undeterred by the wishes of its successors, or of the Local Government Board, as conveyed in letters read from Lord Rosebery and Mr. Ritchie respectively. After much discussion, in the course of which one member (Mr. Selway) said that the Metropolitan Board was not to be "intimidated" by the Local Government Board, and another (Mr. Lindsay) that the Board was not going to be dictated to by "a licentious Press," it was resolved to open the tenders. They were only three in number, and were for the construction of the preliminary part only of the Blackwall Tunnel scheme viz., for "the footway tunnel of cast-iron, lined with brickwork," the whole scheme including two other and larger tunnels for vehicular traffic going north and south respectively. For this footway tunnel the tenders were—

|                     |               |
|---------------------|---------------|
| Kirk & Randall..... | £348,212. 3s. |
| Webster.....        | 327,745. 0    |
| Pearson.....        | 318,840. 0    |

A motion that the consideration of the tenders should be adjourned for a month was lost. After some further discussion,—in the course of which the Engineer (Sir Joseph Bazalgette) stated, in reply to a question put to him by the Chairman, that his estimate for this footway tunnel was 280,000*l.*,—though that sum did not include anything for contractors' risks in carrying out the work, the tunnelled portion of which was to be executed under compressed air,—the Board decided to

accept Mr. Pearson's tender, "subject to the usual conditions and inquiries." In the ordinary course the contract would have come up before the Board for sealing this week; but, as the London County Council declined to be committed in this way to a scheme which they had had no chance of considering, and which not only involved a heavy expenditure, but would have to be carried out under the direction of an engineer other than the one who was responsible for the scheme (Sir Joseph Bazalgette retiring from the public service on the 25th inst.), they invoked the aid of the Local Government Board, who, under the powers of the Local Government Act, were able to issue an order on Tuesday to the effect that the "appointed day" for the London County Council to take over the work of the Metropolitan Board should be altered from April 1 to March 21. This was the death-warrant of the Board, which has now passed away for ever, once more illustrating the lesson that "pride goeth before destruction, and a haughty spirit before a fall."

THE President of the Board of Trade has, it appears, been in communication with the Chairman of the Railway Companies' Association with respect to the increase in railway rates reported to have followed the passing of the new Act, and has made a statement in the House of Commons on the subject. We are thus put in possession of the official version of the matter, which is briefly as follows:—Considerable alterations were made in the rates at the close of last year in view of the probable operation of the Act,—alterations, it is hardly necessary to say, which effected an increase in the charges (chiefly by the withdrawal of special rates). Since January 1, however, the companies have made no advance upon their rates, and have no intention of so doing without giving the required notice. Although the Act was passed in August last, it did not come into force until Jan. 1, so that the advances complained of were really made before it came into operation. It is further explained that if any rates have been charged exceeding those in force on Jan. 1, such advances have been made through inadvertence, and any persons so charged will have things rectified on communicating with the General Managers. We believe it is also the fact that some of the cancelled special rates have since been reinstated, but the questions asked in the House prove that much alarm has been occasioned by their withdrawal. With regard to the revised classifications and schedules, there is a growing opinion that the time allowed for making objections is too short, and it has been stated on good authority that it will probably be extended by two months. The objections will certainly be very numerous, for some of the proposals really seem to invite them. Others, on the contrary, are, in the main, not unreasonable; for we must not lose sight of the fact that, being tied to a maximum charge, the companies are bound to reserve a margin for contingencies, and the sooner their position in this respect is more generally recognised the better it will be for all concerned. The companies cannot be expected to acquiesce in the proposition (which some people seem ready to make), that they shall never, under any circumstances, be allowed to charge more for carriage than they happen to be charging at the present time; for it is certain that the highest prices are not just now ruling in regard to labour and various commodities. We presume they have no intention of forthwith re-arranging all their rates on the "pound of flesh" principle, and valid objections to their proposals will only lie where they would exceed their present powers, or where, after allowing a moderate margin, they are still obviously unreasonable.

THE proposal to establish a compulsory weekly half-holiday by statute appears to be an extreme step in grandmotherly legislation. There is a good deal to be said for the four whole-day Bank Holidays, though it were



to be wished that the two spring ones were permanently fixed, and did not fluctuate according to the falling of Eastertide. But a compulsory weekly half-holiday is a very different matter. One great objection to it is that it would deprive the half-holiday which large numbers already obtain of some of its advantages. There is also to be borne in mind the fact that it is by no means an unmixed benefit or pleasure in all weathers and all seasons of the year to have a half-holiday, if there is no pleasurable or useful way of spending it; moreover, a weekly half-holiday already practically exists, and to a reasonable extent. To extend it further by legislation is at once an unnecessary step, as well as one of very doubtful general benefit.

**T**HE rerados at St. Albans, as our readers will remember, has been restored at the cost of Mr. H. Hucks Gibbs, under the direction of Mr. Blomfield, the sculpture being executed by Mr. Harry Hems. Mr. Gibbs has applied for a faculty to authorise him to restore the Lady Chapel and ante-chapel, the real object being, we presume, to keep Lord Grimthorpe out of it. Lord Grimthorpe has some time since deformed the south transept with his detestable railway-station Gothic, and the north transept, under the same cultured direction, is, we are informed, nearly completed. This latter part of the work we have not seen; but if it is a worthy companion to the south transept there must be a striking spectacle to the architectural mind by this time. Lord Grimthorpe, it has been for some time understood, now wishes to try his "prentice hand on the Lady Chapel, and with the view of saving it at least from such maltreatment as the rest of the building has undergone, the attempt has been made to attack Lord Grimthorpe's legal position. His claim, we understand, is that his "faculty" gave him the whole Abbey to do what he liked with. His opponents are taking the ground that the Lady Chapel is a distinct building, and is not included in the faculty. We should doubt whether they will make this out, though every cultivated person must wish them success, as of course any appeal to Lord Grimthorpe's taste or culture is useless, and the success of Mr. Gibbs would at all events mean that if anything is done to the Lady Chapel, it will be done under competent architectural guidance. To appreciate fully the state of the case, it should be remembered that (as reported some years ago in our columns) the permission to do whatever he chose with this great archaeological monument was granted to Lord Grimthorpe on the exhibition of a design (called his own) to a Chancellor who ostentatiously stated at the time that he was so entirely without knowledge of architecture that he could not even understand what a drawing meant, and it was no use showing him one. The manner in which such a power was granted to an incapable person to disfigure a great national building according to his pleasure, and the manner in which this power has been made use of, form an instance of indifference and stupidity in regard to architecture and to the treatment of ancient buildings such as we should probably find no parallel to in any other civilised country.

**R**ATHER more than four years ago we advertised\* to a formulated proposal for changing the thoroughfare of the Strand between the Royal Courts of Justice and Somerset House. That scheme was advocated by the "Strand Improvement Association." The design, as illustrated in our columns of December 26, 1885, from Mr. W. H. Brewer's drawing, contemplated the substitution of a crescent over the site of Holywell-street, and the re-erection of Temple Bar (now, however, permanently set up at Sir Henry B. Meux's seat, Theobalds, by Waltham Cross) at a spot westward of St. Clement Danes Church, and about south of the present entrance into New Inn out of Wych-street. We commented upon what clearly is the relief most

needed; that is, a fresh approach to the new Law Courts from High Holborn. For a scheme in that direction we may refer our readers to a plan proposed by Mr. Chas. Forster Hayward, F.S.A., architect and District Surveyor, which we printed on November 18, 1882. The leading feature of Mr. Hayward's plan is a circus on the site of Clare Market, with three wide streets therefrom, leading respectively to Little Queen-street, Newcastle-street, and by the side of King's College Hospital to St. Clement Danes Church. We now find that another committee is formed, under the style of the "Strand Highway Improvement Association," for presenting a petition,—at present in circulation,—to the London County Council in favour of altering the roadway between the two points above-named. In October, 1887, the late Metropolitan Board of Works unanimously decided not to accede to the terms of a memorial for removing the church of St. Mary-le-Strand. The former "Association" above referred to, desired to save the church, but as we see that the petition circulated by the "Strand Highway Improvement Association," which specially demands the removal of the church, is signed by the same gentleman, if we remember right, who was secretary of the previous Association, we presume some of these gentlemen have changed their minds. They demand also the removal of the Holywell-street houses; and if that were done, the two churches, with a garden between them, and the roadway on either side of them, would combine to form a noble effect, as we have over and over again pointed out. But the middle-class English mind is so contemptuously opposed to all considerations of architectural beauty in a city that we believe many persons would feel a satisfaction in getting St. Mary's removed if it were only to show their contempt for "sentiment." If they succeed in getting their way, they will have the responsibility of having permanently destroyed the picturesque character of this corner of London.

**I**N Committee on Supply on Wednesday, some questions were asked of the First Commissioner of Works in regard to public buildings, especially as to the time when the new Admiralty Offices, or the new work in connection with them, we should rather say, would be finished. From the reply to this we learn that there has been unexpected difficulty with the foundations. The point that struck us most in the conversation, however, was the remark of one member in regard to the steps that have been projected into Westminster Hall:—

"Mr. J. Ellis said he stood aghast when he saw the new steps which had been placed in Westminster Hall, and regarded them as having defaced that historic building. (Hear, he.r.)"

We have over and over again repeated that when Parliament and the public found out the real effect of this "restoration" on Westminster Hall they would be indignant; now they are beginning to find out when it is too late, as we knew they would. Mr. Ellis and other members might have found this out long ago if they had listened to those who could give them correct information. Mr. Plunket said the steps had been carried out "in pursuance of the decision come to by the Committee of that House." Just so: of a Committee consisting of a majority of ignorant persons consistently opposed by the small minority who knew anything of architecture, and whose report remains a monument of architectural absurdity and folly.

**I**N the case of "The School Board for London v. Northercroft Son & Neighbour and others," Mr. Justice A. L. Smith has decided that the plaintiffs had no claim to demand the giving up of the defendant's vouchers, accounts, and documents, in order to be used for the Board's own purposes. The plaintiffs had taken out quantities in the usual way for two schools, concerning which, after the buildings were completed, the Board were not satisfied, and ordered an inquiry to be made, and the Board's solicitors wrote to the defendants to send them all the

documents they had in relation to these schools. They refused, on the ground that such documents were their private property, used in arriving at their results. The learned judge said: "The action is one of detinue, and there is a claim for 38*l.* for work done by Mr. Rickman in remeasuring the schools. But an action of detinue will not lie, for how can the defendants' private memoranda be the property of the plaintiffs? The ink, paper, and brains used in making them are all the defendants', and they are right in law in refusing to give them up. It has been argued that it is a breach of duty on the part of the quantity surveyor to refuse to give up his memoranda to his principal for purposes of measurement; but that is exactly what the plaintiffs have not required them for, but they wanted the documents in order to make a case against the defendants." This, as will be seen at once, is a judgment which may be of considerable importance to surveyors as a precedent. It appears that the School Board, in the course of their inquiry, discovered an error in excess in the quantities amounting to 677 cubic yards (of what material the law reports in the daily papers do not say), for which payment had been made to the contractor. As the contractor admitted the error and (very honourably) returned the money, this dispute was practically settled; otherwise, the learned judge said, it was for the plaintiffs to make out the case against the surveyor, and it was not suggested that the mistake was anything more than a clerical error. If that means a mistake in copying not in calculating, of course that puts it on a very different footing. Still, 677 cubic yards is an error of some magnitude, in some cases of work at all events.

**A**T the last, and what proved to be the final, meeting of the Metropolitan Board of Works, on the 15th inst., it was resolved, on the recommendation of the Works Committee, that from and after the 25th of March (on which day Sir Joseph Bazalgette will retire), "and until further order of the Board or their successors" Mr. Edward Bazalgette be authorised to act as Engineer *ad interim*. We do not know what the London County Council is doing with regard to permanently filling up the office, which is one that ought to attract good candidates. Mr. J. Gordon, the present Borough Surveyor of Leicester, has already expressed his determination to come forward at the proper time. The only other name we have heard mentioned in connexion with the appointment is that of Mr. Clement Duncombe, the City Engineer of Liverpool, but we do not know whether he is likely to be a candidate for the office.

**A**S usual at the Institute of Water Colour quantity of drawings is quite disproportionate to quality, and productions by members of the Institute are hung on the line which in themselves are enough to lower the status of the exhibition. Look, for instance, at such a piece of drawing-master effect as "Sunset on the Llugwy" (47), by Mr. P. Mitchell, or M. Jules Lessore's "Edinburgh Castle from the Calton Hill" (100), which shows an ignorance of the most ordinary problems of perspective; the imitation Lyciscates monument in the foreground is all out of drawing, and the artist apparently does not know how to treat the perspective of a landscape when seen from height, and calls this a view from the Calton Hill, when, in fact, it is a view from a level, or nearly so, with a low horizon. The President's painting seems to come more or less to the mere fine execution of rich costumes exhibited on a lay figure, for really his "Beppina" (323) is nothing more than this. Among the architectural disabilities is Mr. Medleycott's "Vau hall Bridge" (397), in which the bridge is most feebly drawn. On the other hand, we have Mr. Fulleylove's admirable view in the High-street, Oxford (337), and Mr. Yeel King's "Water Bridge, Newbury" (116), well-treated architectural subjects; also, in

\* The Builder, January 17, 1885.



more picturesque and less professedly architectural manner. Mr. Holloway's "King's Lynn" (13), a fine and important work, and Mr. Newton Bennett's small and delicately executed view in "Sandwich" (79), which deserved better than to be put down on the floor. Among the more important figure subjects are Mr. Dadd's "Between Ourselves" (19), a highly-finished little painting of two men in conversation over their wine, figures and faces expressing real character and not mere execution; Mr. Walter Langley's "Oh! for the Touch of a Vanished Hand" (123), a work of great feeling and beauty in every part; Mr. C. Green's "Mr. Pantalini and the Brokers" (409), a capital transcript of Dickens (why does not this artist by his hand also at Thackeray, who has been so little and so inadequately illustrated?); Mr. Dollman's "The Health of the Tide" (464), horses and postilions at the door of a mansion,—the same artist's single-figure picture, "Something Wrong" (48), should not be overlooked; Mr. Frank Dadd's "Corred" (477) a large and clever work with many figures, but which tells no distinct story; Mr. Henry Stock's two allegorical or visionary works, "Immortality's Sunrise" (90) and "A Musician's Fancies" (807). Among landscapes one of the most remarkable is Mr. Arthur Severn's "Sailing into Venice by Moonlight" (776), which is wonderfully successful in portraying an effect most impossible to give by mere pigments. Mr. Bernard Evans's "Knaresborough" (195), though there is too much striving after effects in it (as the white church tower against a dark cloud), is a grand tumultuous and of landscape, with a great impression of air and light about it, and a very fine sky. Mr. Alfred East's landscapes are distinctly and strikingly original; "Wind and Rain" (6) is admirable in conveying the impression intended, also "Waking of the Day" (21). Among others are Mr. Knight's fine though mannered work, "A Moorland Road" (1); Mr. Thos. Pyne's "The Black Rabbit, or Arundel" (23); Mr. Arthur Severn's "Amiens" (85); Mr. R. W. Allan's "A Cheery Day in Arran" (128), which thoroughly answers to its title; Mr. Fraser's "A Lame Jack in the Channel" (237), a ship the worse for weather getting along under a scratch rig, a remarkable piece of colour, with the most blue tone of the hull in shadow and the cold grey-green of the water, which rather seems hardly natural, though the sea is admirably drawn; Mr. Jas. Orrock's "Naworth" (527); Mr. Lucas's "The Cheerful Harvest Waves in Gold" (594) also rather merdome in effect, but fine notwithstanding; Mr. Collier's "Cutting Gorse" (327) and "Moor and Mountain" (448). Architects would look at Mr. Cipriani's "Ruins of Rome" (51), part of the Forum seen between two columns in the foreground,—an admirable presentation of ancient architectural fragments.

THE best picture in the exhibition at Mr. Wallis's Gallery is Professor Holmberg's "Musicians at Fault—the Lost Chord" (1), a very sumptuous and brilliantly painted Quatorze interior with three ecclesiastical figures, two with a violin and violoncello; one of them pauses, pointing with his bow to the music before him. The head of this figure is very noble in character, and the whole work, both in feeling and execution, rises to a high order of painting. J. V. Bremer's large painting of the "Descent from the Cross" (106) is an academical picture, hard in texture, crude in colour, and the dead body taken from the cross does not hang the arms of the bearers as a dead body should: it is as if carved out of wood. The left part of the picture, the only really interesting part, lies in the figures and expression of the three Marys, which are finely contrasted: the drawing is excellent throughout, but the colour is in the main uninteresting and lifeless. There is a great deal of beauty in the interior scene by Walther Friele, called "Needlework" (1); there is rather too much white in the

picture, but the attitudes and character of the three women are carefully studied, and the little child seated on the floor is admirable. Mrs. Benham Hay's large semi-decorative painting of "A Florentine Procession" (93) for the burning of mundane vanities (under the influence of Savonarola's preaching) is an excellent and carefully-painted study of ancient costume and accessories, but a very hard picture, and one in which we cannot feel much interest, in spite of the great talent it exhibits. A small Meissonnier, "Le Rieur" (64), is a painting of a man in the act of laughing;—always a doubtful subject for painting; it is painted with the artist's usual finish and power, but will not rank as one of his most agreeable works. A considerable portion of the walls is occupied by small sketches and studies by Heffner, and as the gallery contains a large-size completed work in this artist's usual style, the cult of Heffner,—a very mannered artist with all his power of effect of a kind,—seems rather too pronounced. The exhibition includes one or two small works by Israels, others by Seiler, Bertrand, and other well-known names, one or two little works by Corot and Daubigny, some admirable donkeys by De Haas, &c.; but we do not find it up to its usual level of interest. The first-named painting by Professor Holmberg is, however, worth going to see for itself alone.

THE *Full Mall Gazette* prints the opinions of various tradesmen in the Strand as to Strand improvements, as if the architectural arrangement of London were to be settled by the opinions of the shopkeepers of this or that neighbourhood. Of course, most of these gentlemen would delight in pulling down St. Mary's. We have pleasure in recording that one of those interrogated showed more sense of the fitness of things. This was Mr. Coombes, picture dealer, 331, Strand, whose reply was, "Take away the Wychestreet and Holywell-street blocks, make a good roadway to the north and south of the churches, and leave them standing. I do not see the necessity for pulling them down, and if they stood in a good wide thoroughfare I think they would be ornaments." Probably Mr. Coombes's avocation has led him to have some regard for the artistic aspect of things, which to the average tradesman is vanity.

ONE of the scenes in the setting of the "Merry Wives of Windsor," now running at the Haymarket, contains a curious mistake, which shows the importance of the scenic artist attending to all the circumstances of the scene he is to illustrate. In the scene where Falstaff announces to "Master Brook" his intention of risking a second visit to Mrs. Ford, he observes that he has an appointment between eight and nine that morning (in those happy days people breakfasted at half-past six in the morning), whereupon Ford says "Tis past eight already." But at this time, just after eight in the morning, the sunlight is throwing the shadow from the window-lead down the jamb of the window at an angle of 75 deg. or thereabouts, so that the sun must be as high in the sky as if midday were the time intended. This oversight in solar chronography should be corrected: "a little charge will do it."

**The Monument to General Grant.**—Some four years ago, it may be remembered, a subscription was opened in New York for erecting a monument to General Grant in that city. The designs for the same were accepted, the cost being estimated at 500,000 dolrs. However, up to the present time only 130,000 dolrs. have been subscribed, and now the donors either demand a statue for their money or to have their subscriptions returned. The monument committee has, therefore, decided to begin the erection of the monument, in the hope that when people see it in progress, funds will come in, and if this should not be the case, that the civic authorities will finish it, rather than permit a monument to remain in a half-finished state.

#### FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

##### ENGLISH AND CONTINENTAL DOORS.

THE sixth and last\* of the present series of lectures at Carpenters' Hall, on subjects connected with the building trades, was delivered by Mr. Thomas Blashill, F.R.I.B.A., Superintending Architect of Metropolitan Buildings, on the 13th inst., as briefly mentioned by us last week. Mr. Blashill said:—

Being once more invited by this Worshipful Company to address an audience of practical men, I could think of no better subject than The Door. It is a subject somewhat neglected in England, and a useful hour may be spent in comparing foreign notions of design and workmanship with our own.

As all modern design is founded upon ancient examples, we will devote a few minutes to those standards of excellence which time has spared, or which poets and historians have described for our information and delight.

From the earliest times the doorway has been treated as the most important feature in the exterior view of a building. Beautiful design, costly materials, exquisite workmanship, have been lavished upon it. It has been made interesting by every means that art can devise. I will quote one word-picture of a doorway, because, amongst ancient writings, it is the oldest, the finest, and the most familiar. Homer tells ("Odyssey," Book vii.) how Ulysses, approaching a certain palace, stood admiring before the brazen threshold. It was like the shining of the sun or moon through the lofty-roofed house. Golden doors closed the entrance. The pillars of the jambs were of silver, carrying the silver lintel. Of gold was the ring that moved or fastened the door.

To come down to dry history, in the Temple built by Solomon the doors were of fir, hung, folding, to posts of olive-wood; they were carved with cherubims, palm-leaves, and open flowers, and were covered with gold, fitted upon the carved work. In the East, whence such gorgeous ideas have come, remains of wooden doors have been found that were covered with plates of bronze, adorned with scenes illustrative of the conquests and the triumphs of the kings. The Romans used in their doors such woods as cedar, cypress, elm, and oak, and, of more precious materials,—iron, bronze, ivory, and gold; but not silver, as it seems. One rich Roman was reproached for being the first to use dressings of Numidian marble in his doorway; another for having bronze jambs to his porch. The doors of the temple of Minerva at Syracuse were finished with gold and ivory, ornamented with heavy golden knobs and with historical subjects most elaborately wrought. St. John the Divine tells of a city whose walls were ornamented with all manner of precious stones, every gate or portal being of one pearl. In the Pantheon at Rome the ancient bronze doors, cast in thin plates, still turn upon their pivots, after nineteen hundred years. They are adorned with rosettes and studs, and measure 14 ft. wide by 24 ft. high. The bronze doors from the Senate House at Rome, now in San Giovanni in Laterano (see illustration), measure 15 ft. by 29 ft. high, and are richly ornamented with stars and studs, and foliage. The bronze doors now in the Church of SS. Cosmo and Damiano at Rome (see illustration) are framed with stiles and panels, and moulded with ogees and enriched beads. Indeed, all these bronze doors clearly indicate a knowledge of wooden construction, which was imitated not only in bronze, but also in stone and marble. The temple of Diana at Ephesus had doors of cypress-wood, that were said to be uninjured by exposure after four hundred years. But of far more value than costly material is the art of the skilled workman. In the Church of Sta. Sabina at Rome there are now doors of olive-wood perhaps a thousand years old. They are boldly carved with scenes from scripture-history, fairly well preserved. The Church of San Zenone, at Verona, in North Italy, has wooden doors of the twelfth century, on which are nailed bronze plates, adorned with figures of a like kind. I exhibit a photograph of twelfth-century bronze doors, from the Cathedral of Pisa.

It is hardly possible to do more than refer to illustrations of the doors of the Medieval or Gothic period of European art. They were often, in the earlier times, covered with plain,

\* For reports of the previous lectures, see *Builder*, pp. 109, 127, 145, 156, 205, *ante*.

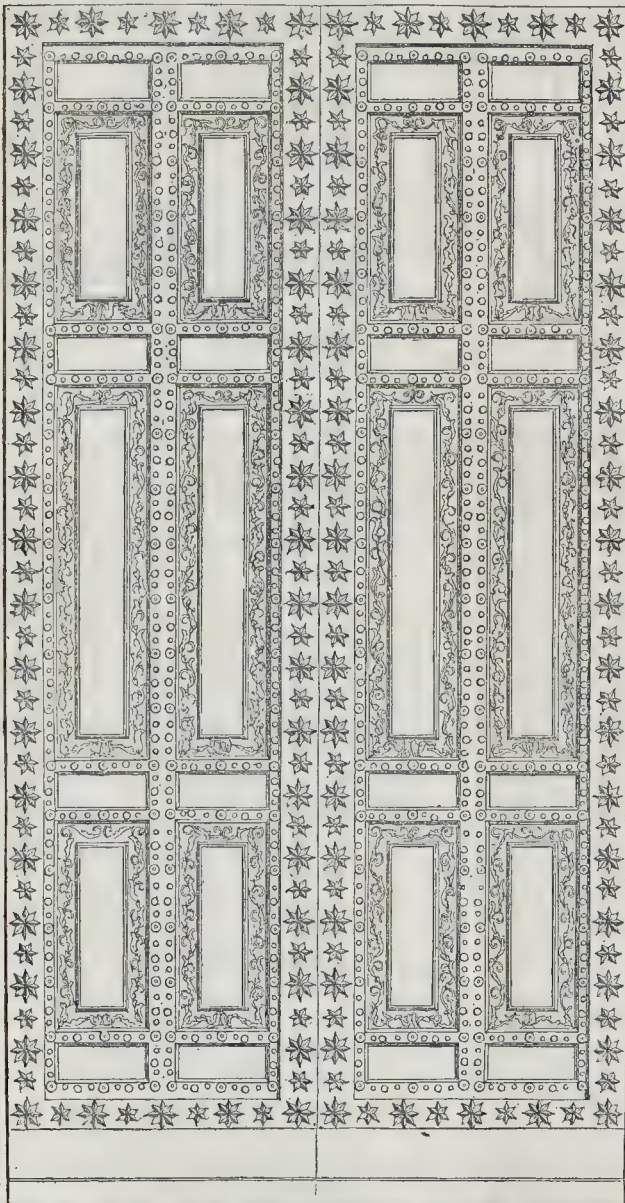


upright boarding, nailed on ledges, the hinges being developed into the most intricate and beautiful patterns that the smith could execute. Sometimes the boarding was made to alternate, one board being plain and the next moulded. Later, they were framed in designs similar to those of the contemporary window-tracery, or carved with figure-subjects. I show one such

doors that still exist. One pair, finished in 1330, is adorned with panels containing Scripture subjects. But those made by Lorenzo Ghiberti, a hundred years later, are the glory of Italian art, and were said by Michelangelo to be fit for the gates of Paradise. A copy of these doors, gilded as they were originally, is set up in the South Kensington Museum, and bits of the

Rome, executed early in the sixteenth century, and quite in the taste that now prevails on the Continent. In the centre of each is a great circle surrounding a lion's head holding a ring. Above and below is a panel, and the whole is covered with ornament in relief.

These old examples illustrate nearly all the points that we shall have to consider in relation to the modern door. Practically, the modern door is, with rare exceptions, a construction of stiles, rails, and panels. Some doors in the Church of St. Sauveur at Bruges, dated 1444, but looking much later, are an early instance of the modern type; each is divided, vertically by a muntin, and horizontally by two rails, into six equal moulded panels, each panel having a moulded sinking filled with carved ornament. Le Pautre published in 1654 many examples of highly-enriched internal doors, single and folding, each being of two or three panels variously proportioned. Observe that there is no muntin in any of these doors, the general design corresponding with the French doors of to-day. The bronze doors taken from the Senate House at Rome, which have muntins, illustrate the former method; and those of the Pantheon and the Church of SS. Cosmo and Damiano, which

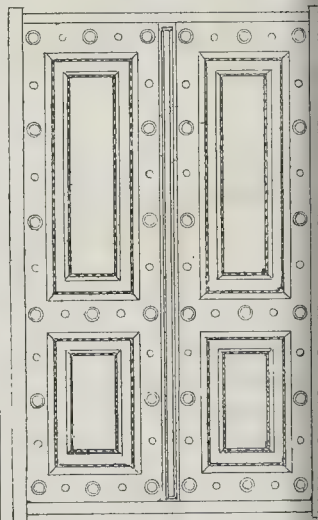


Door of San Giovanni in Laterano, Rome.

composition from the Cathedral of Burgos, in Spain. But the magnificent brass gates or doors of Henry VII.'s Chapel must not be forgotten. They are of wood, skeleton framed, and covered with elaborately-ornamented castings, which were gilded, as bronze appears to have generally been treated at all periods.

The Baptistry at Florence was provided with

ornamentation are used as models for students in all our schools of art. In the same museum are also casts of the wooden doors from St. Maclou at Rouen, made in the middle of the sixteenth century, and covered with an abundance of figure sculpture characteristic of that period of the Renaissance. I exhibit a view of a pair of doors from the Loggia of the Vatican at



Door, Church of SS. Cosmo and Damiano, Rome.

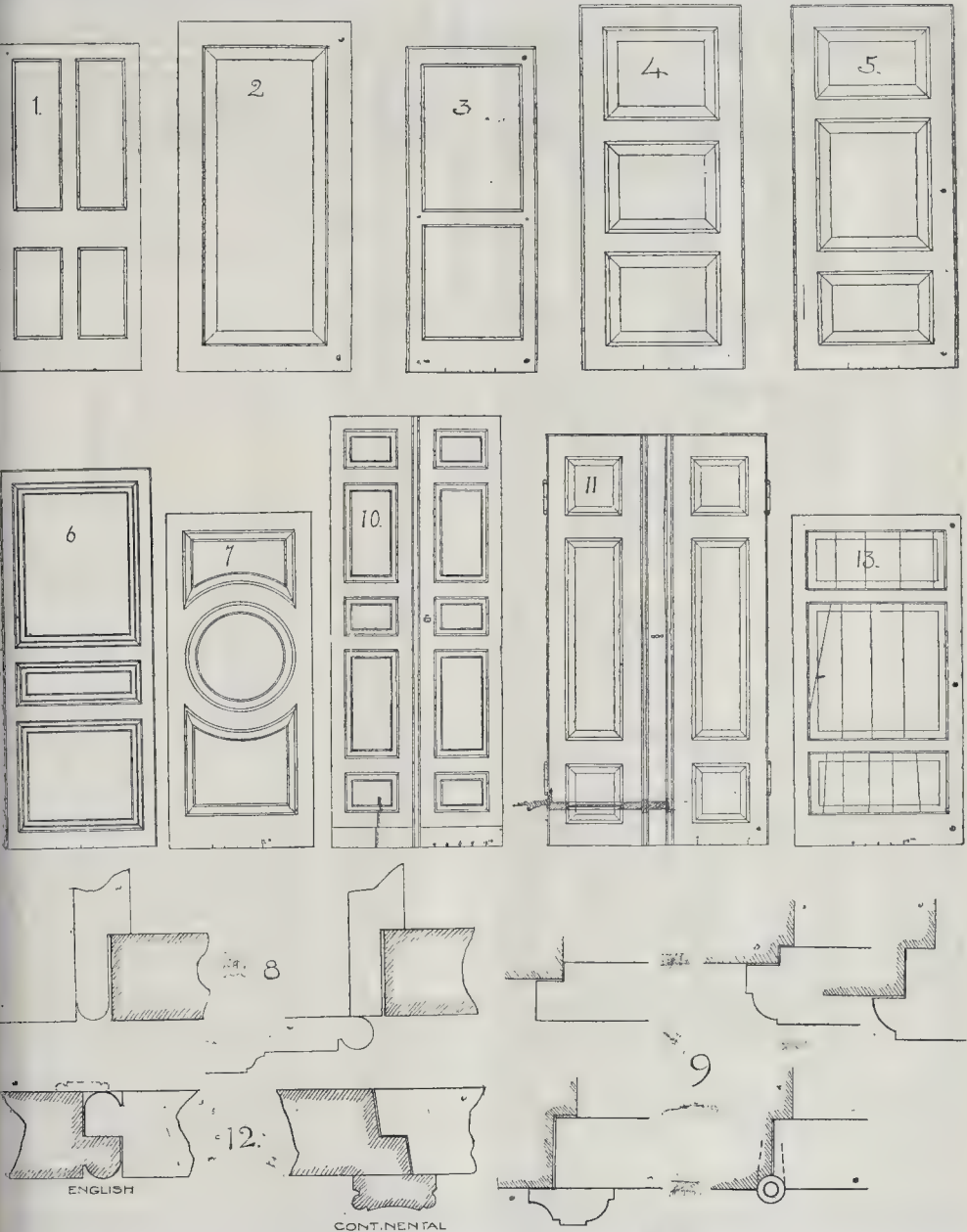
have no muntins, illustrate the latter. We shall see the importance of this distinction. Le Pautre's designs were made at the commencement of the reign of Louis XIV. That, and the reign of Louis XV., must have been the golden age of joiners and decorators. France, and the countries under its influence, became impoverished by the erection of ruinous palaces and princely mansions, too grand for habitation. The time of Louis XV. was marked by a profuse use of carved or moulded ornament in the shape of scrolls and shells, arranged in wildly distorted patterns. I exhibit a drawing taken from a modern example, as the best I have in hand.

England did not escape the mania, but was less affected than other countries. Very many of the grand mansions referred to have been destroyed or abandoned. I have walked through others fitted up with joinery like the others, empty, or used to store farm produce. I know a French village every cottage in which has a Louis XV. door despoiled from some such mansions.

With the present century came in a taste for pure Classical architecture, that, in spite of the Gothic revival, has continued to this day. The doors of which our modern houses furnish examples are generally adapted from Classical models that are distinguished by correctness of taste, and by an absence of any quality that might make them interesting. The critic can find no fault with them, the artist can take no pleasure in them, nor can the ordinary human being enjoy an honest laugh at them. We may, at least, use them as a foundation for the study of door-construction in its simplest form, and



a means of contrasting Continental notions joinery with our own. It would be possible for a traveller to make fair guess as to the country in which he was lodged by an inspection of the joinery and ironmongery of the door of his room; but the influence of France and Italy in all the adjacent countries has caused certain common characteristics in Continental doors that distinguish pair of folding - doors. I once saw a very old specimen of a door with a muntin, preserved in a Dutch museum. As the effect of this is to make the panel more than double the width of ours, we will begin with the consideration of the panel. The English joiner of to-day seems to be afraid of a panel more than 18 in. wide, and prefers to keep it less than 12 in.; but in old English work the panels of doors and generally (though I do not know why) that doors of narrow panels are made thick, while those of wide panels are made thin. Early in the last century the foreign fashion of wide panels prevailed in England for a time. My example from Hereford, with two wide panels, is only 1 in. thick. I lately found a door at Roshampton of similar date, but of six narrow panels; it is 2½ in. thick, the panel (raised on



them from those on this side of the Channel. A good ordinary English internal door finishes not less than 1½ in. thick; a Continental door, though probably 6 in. to 12 in. higher, and perhaps wider, is seldom more than 1½ in., sometimes as little as an inch. As the most striking distinction, the ordinary English door has always a muntin down the middle (fig. 1), the Continental one never,—unless under the influence of English fashion, or to imitate a wainscoting are often as wide as those we find abroad. It is an exceedingly rare thing to find these wide panels split, or even showing the joints, of which there must be two or three in each. Our good ordinary English doors have flat panels; the Continental panel is always raised on one side, or both: indeed, with such thin doors, this is necessary, in order to gain sufficient strength. Even so the thickness of the panel will be less than ½ in. We may say one side) being 1½ in. Graining is not very common abroad, white or pale tints being preferred. When the painter has to grain oak on one of these fine panels, say 2 ft. 3 in. wide, his pattern is not wide enough to extend across it. He therefore draws a pencil-line down the panel, a good deal out of the middle, and stops his pattern against that, so as to produce conscientiously the effects of the joint which he knows must exist, though the joiner has care-

fully concealed it! The "rising" on the panel is often produced simply by reducing the margin by a full  $\frac{1}{2}$  in. for a width of 1  $\frac{1}{2}$  in. or 2 in. If raised on one side only, the painter will often show his sense of fitness by imitating a bevelled rising on the other side. The bevelled rising itself is also common.

The normal English door has four panels; sixty years ago six panels were more common. The position of the principal rail in the door is fixed by the necessity of providing for the lock. An English lock is actuated by a smooth round knob. The most convenient height at which the hand can grasp such a knob is 3 ft. 3 in. from the floor.

In the Continental door there is no fixed rule as to the position of the dividing rails, the door being too thin to be morticed for the lock. If a rim-lock does not come conveniently at the rail it must be made short enough to fix in the width of the stile. The favourite height of the handle is 3 ft. 9 in., at which height a lock is most easily actuated by a lever handle,—as is most common in France, Italy, and Germany,—or by the less common crutch handle, or the ordinary Dutch form, which is like a thick gimlet handle. I may here note the utility of the elegant French lever handle for glazed doors. Doors that are to be glazed being usually made with diminished stiles in the upper part, the hand must be kept well clear of the jamb of the door. Lever and other powerful handles, however, speak volumes as to the mechanism of the Continental lock, which is obstinate and noisy as compared with ours.

So the Continental door may be divided into panels of any proportion as to height at the pleasure of the designer,—or may not be divided at all: rather often it is of one panel only. I show an example from Holland (fig. 2), the panel measuring as much as 6 ft. by 2 ft. 6 in. The two-panel door, exactly like my Hereford example, is very common everywhere in rooms of small importance, the panels being often of different heights. My example from Leeward (fig. 3) is constructed in a curious way,—first, a slab like a table-top, but only  $\frac{1}{2}$  in. thick, was made of the full size of the door opening; then on each side of it thin boards  $\frac{1}{2}$  in. and  $\frac{1}{4}$  in. respectively were laid or planed on, to show as stiles and rails. On the outside these stiles were run the full height, so as to imitate the usual form of framing; on the inside the rails were run out the full width, so as to strengthen the door by the crossing of the imitation stiles and rails. Doors so constructed,—of which I have seen several,—seem to stand about as well in ordinary work as others, and I came to the conclusion that for some reason the Continental joiner may construct his door anyhow with impunity.

The three-panel door is the most common, and is used in the best work. My examples show every mode of arranging the panels: they are exactly like those given in Le Pautre's book. The three panels may be of equal height (fig. 4), or the middle panels may be the longest (fig. 5), or the top and bottom panel may be equal with a narrow panel between (fig. 6), or the top and bottom panels may be of different heights. Hence the possibility of considerable variety. These panels are not very often moulded on the rising, but sometimes a projecting moulding is planed on. There is great variety in circular work on doors. I think it is seldom satisfactory, being contrary to the nature of the material, and likely to split. I have here a pretty good specimen from an old house at Herne Bay (fig. 7).

As to the mouldings round the panels. The custom of planting them on is now nearly variable in England, using flat ogree mouldings, more or less elaborate. The old custom here, and the present custom abroad, is to work them on the stiles,—a simple ovolo, or quarter-round, which cannot well be planted in, being the most general. The use of the belection moulding, which projects beyond the face of the framing, is rare, and they put it on as we do; but that is not the proper way of making a bold projecting moulding round a panel. Rondelet's "Art de Bâtir" gives modes of framing in which a solid piece of moulded stuff thicker than the door is introduced between the stile and the panel. Elaborate groove and tongue arrangements are made for uniting the several parts. The author says these mouldings have gone out of use. Something similar may be seen in English books; but I fear they are seldom used here. The detached belection moulding supplies their place. In good polished work you may

screw these mouldings on to the panels from the back, and afterwards cover the screw-heads with an ordinary moulding on the other side, or may dowel another belection moulding on that side. Nobody will distinguish between this and solid work, and if you posted a man by the side of the door to proclaim it, very few outside this room would care whether the work was solid or not.

The English door is put together in this way:—The two stiles run the full height,—as is the practice with such framing everywhere; the rails are tenoned into them; the lock rail, and, perhaps, the other rails having double tenons; the top and bottom rails have their tenons reduced or shouldered, so as to keep the mortice away from the ends of the stiles. All these tenons go through the stiles, and the framing is fixed with wedges and glue. A good Continental door is similarly made, but pins are nearly always used, and the corners of ordinary doors are often strengthened by L irons. The edges of our doors are made nearly square (fig. 8), being fitted into a simple rebate, so that the door is flush with the architrave, or sunk to the depth of the bead at its edge. The hinges are always a disfigurement, as they do not line with anything on the edge of the door or its dressings. Every joiner has his own view of the way in which a door should be hung. In one of the examinations in joinery of the City and Guilds of London Institute I set a question as to the mode of hanging a door, the faults to be apprehended, and the precautions necessary to avoid them. There was a surprising number of thoughtful, excellent replies from all parts of the country. One important point was the total difference to be allowed between the width of the door and its opening,—a quantity difficult to define, something between  $\frac{1}{4}$  in. and  $\frac{1}{2}$  in. Thirty years since I went down with Mr. George Myers to look at the doors of a large mansion, which his men were hanging so that many of them sprung open after being closed. We looked on while the case was being argued out by the men immediately concerned. All agreed that the doors were "hinge-bound." I remember, when the clerk of works insisted that the fixer should gauge the space with a half-crown, Mr. Myers promptly broke in with the suggestion of a halfpenny, because the joiner's wife would most likely take care of his spare half-crowns. In important work a brass gauge may be used.

The continental joiner has not much difficulty as to nicety of joint, for the door is commonly hung to project  $\frac{1}{2}$  in. in front of the face of the architrave, and is rebated and moulded so as to hide the junction. I show several examples (fig. 9). The doors are too thin for our short butt hinges, so old-fashioned projecting hinges 8 in. by 10 in. long are commonly used, often driven into the door, projecting outward, and made rather ornamental. In Holland, from whence most of our notions of joinery must have come, doors are generally made thicker, and hung in a rebate flush with the architrave, as with us.

One of my Dutch examples shows a small quarter hollow taken out of the edges of door and architrave, so as to form a semicircular channel. In this the knuckle of the hinge lies symmetrically. If you can get fixing for the butt hinge, the idea is worth considering. It is rather common abroad to see a door that is meant to be self-closing hung with a pivot on the floor, a crank being formed on the pivot so as to throw the door out of upright. We do the same thing by means of rising butts. For my part I see no utility in such contrivances. The door of a room should stay exactly where you leave it, and I was always taught to leave a door exactly as I found it.

The English rule, by which every room is entered from a passage, and most rooms are unconnected with any others, has no force abroad. There the rooms of a floor will often communicate throughout, independently of passages, and the sole access to a bedroom may be through a sitting-room. Hence the importance of the French proverb, "a door must be either open or shut." Folding doors between such rooms are very common,—not the wide doorways by which we make two small rooms into one large one, but openings of 3 ft. 6 in., or a few inches more, and made lofty, so as to look handsome when both leaves are thrown open (fig. 10). If you have to squeeze a little when one only is open, you know that there is the other if you like to use it. See Le Pautre's designs and my examples. That from Dresden (fig. 11) shows the way in which all the rooms

on the principal floor of a house communicated by means of doors 4 ft. 3 in. wide, the least usually opened being the largest, and 2 ft. 5 in. in width.

Our external doors are designed on the same principles as internal doors, but thicker and with more use of the projecting belection moulding, and with more variety in the arrangement and execution of the panels. Any good neighbourhood built more than fifty years back, such as Bloomsbury, will show an immense variety of severely Classical patterns. There is much more sameness and a more obtrusive show of cheap mouldings in doors of the present day. Our churches of the eighteenth and early nineteenth century, and our Classical public buildings, such as the National Gallery, contain excellent specimens of panelled doors for all to see. The doors of St. Pancras Church, taken in connexion with the stonework, are amongst our finest samples of noble entrances. Abroad entrance doors of important scale are abundant, and the design often elaborate, even to extravagance. They are generally made folding, show examples of French doorways of varied design. The habit of combining stable buildings with town houses causes the necessity of grand doorways, 10 ft. wide by 12 to 20 ft. high, framed with wickets. It is common to have large open or glazed panels in doors filled in with good patterns of ironwork, so that you may inspect a visitor before letting him in. In Italy, a good strong door has always been thought necessary for defence,—or, at least, for exclusion,—even by day. There the habit still lingers of keeping a visitor standing outside the door, even if he is on friendly terms, while the servant, who has identified him through a little barred opening, goes to take the master's directions before opening the door.

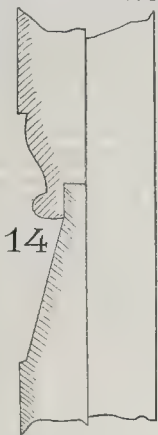
In the practical details of a door,—as in everything else,—if there are two reasonable modes of effecting an object, the Englishman will choose one mode, the Frenchman the other. We have one familiar design for the meeting of a pair of folding-doors,—by rebating and beading the stiles; in good work a fillet is added inside. The French prefer to put the fillet outside (fig. 12). It is often made exactly like that of the junction of the great bronze door of the Church of SS. Cosmo and Damiano. Often, too, it is made as a slender pilaster, with cap and base.

After a pretty long observation of Continental joinery, I was puzzled to understand how panelled doors, such as I have been describing, stood so well. The construction seemed risky at the best, the workmanship not particularly good; but a cracked panel or a joint that had failed is hardly to be seen. At length, when I was staying in a fine palazzo, or mansion, in an Italian city, I observed a very interesting door of recent construction, simply stained, and, therefore, easy to examine in detail. I exhibit its portrait (fig. 13). It is 6 ft.  $\frac{1}{2}$  in. by 3 ft.  $\frac{3}{4}$  in. or a fifth larger in surface than our usual full size; yet its thickness is only a bare  $\frac{1}{2}$  in. It bends like pasteboard, but springs back readily into shape. The three panels are over 2 ft. 8 in. in width. Each is made up of five or six pieces of board of different widths, some being wedge shaped, as is not uncommon in countries where our clean, straight deals are not known. The panels are only a full  $\frac{1}{2}$  in. thick at the edges, and, being raised on one side, are a bare  $\frac{1}{2}$  in. in the centre. I have seen such panels in the workshop, glued up ready to plane. No two pieces are of similar thickness; the surface is incredibly rough and hopelessly twisted. If the whole door I counted 110 noticeable knots besides heart-shakes, and two or three holes that had been neatly filled in. The joiner who had made it eighteen months before, told me it was made up of odds and ends of some common fir, which his employer, who was economical, wished him to use up. He should have preferred cedar, and the door ought to have been a quarter of an inch thicker. The panels were not tongued, but simply joined with the best Naples glue; the mortices for top and bottom rails were cut out to the ends of the stiles, though he knew that in old work that was not done. Still, he would warrant his door to stand (as, indeed, it did), for the boards had been laid up more than a year in the house, and were perfectly dry. I came to the conclusion that this thorough seasoning is the secret of the whole matter. If it is not, I know no other. As to the joints in the panels, I have seen cases of failure in large church doors, and they were either ploughed or tongued solid, or water-



welled together. They had failed from exposure to the weather.

Our common ledged door is limited to entrances of little importance, but, on the Continent, it is often used for doorways and for large carriage-gates. The English notion is to show the boards perpendicularly; abroad they are very often put horizontally, like feathered weather-boarding, or are sloped both ways from a central line, and are moulded in the lower edge, the upper board rebating over the lower. They are nailed on to a back of perpendicular boarding (fig. 14). Some-



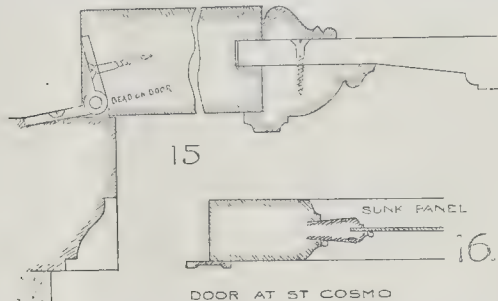
times the moulding is very rich externally, nearly the full width of the boards,—an idea that we might utilise. With us weather-boarding has degenerated; in old work the edges are often moulded with a quarter-round, at least with a bead.

No notice of Continental doors would be complete without reference to those left by the Moors, who for a long time held possession of Spain. Their art was similar to that of all the Mohammedan races,—in Turkey and the East generally. Of these I exhibit several examples, framed very much like our own doors, the panel being, however, kept flush with the framing, and composed of a mosaic made up of different kinds of hard wood inlaid with ebony and ivory, forming exceedingly beautiful interlaced patterns. One of these doors is covered with leather fixed on plain upright boarding by many pieces of ornamental bronze. In the north-west corner of the South Kensington Museum are beautiful examples of such doors can be seen. Knockers were common, as they were in ancient Rome, where bells also were used. The Dutch, from whom we get our notions of quiet, homely comfort, object to knockers, because they make a harsh, disturbing noise; they prefer bells. But no one ever goes through the front, or bow, door of a real Dutch house, except to be married or buried.

I have already said as much as I think useful about door furniture. As regards the best class of English work, we have very little to desire, and I know of nothing that we could learn from the Continental practice.

Thus far I have been treating of Continental as compared with English doors, and, to some extent, of the ancient examples from which most these have been derived. Such studies must leave on our minds some very interesting impressions. We see that from the earliest times, even before the dawn of history, men delighted to have the entrances to their buildings nobly designed and beautifully adorned, and this sentiment has continued down to the present day, though not to any great extent amongst ourselves. I cannot call to mind that I ever saw any one pause before a modern English doorway with wonder and admiration, as the travelled and experienced Ulysses did before the palace gate, or take any kind of interest in it, except as an obstacle to be pushed aside. A cynical friend of mine avers that he once caught some one very much interested in a door, but it was evinced by applying the ear to it,—not the eye. We are very far behind most other countries in the art of making things interesting by their grandeur, richness, or beauty of design. Through carelessness and the pressure of other occupations and thoughts we

neglect to appreciate such qualities. It is not so on the Continent. Italy is a store-house of noble and beautiful objects of all kinds and of all ages. France, less rich in ancient examples, is better able to find the means of producing costly modern works, and I have shown how great its influence is upon all Continental countries. In a very striking passage, written 750 years ago, and which ought to interest us, William of Malmesbury compares the English before the Conquest with the nearest Continental people. He says:—"They,—that is, the Saxon English,—consumed their whole substance in mean and despicable houses,—unlike the Normans and French, who, in noble and splendid mansions, lived with frugality." Whatever their faults, they were good friends to the carpenter, and the Frenchman of today retains much of the same sentiment; so that there is still a good deal of the same sort of difference between the two races. In choosing between different ways of doing a thing, the Englishman instinctively prefers that which is strong and works well,—the Frenchman that which, to him, looks grand or beautiful, not doubting that he will manage to make it work. He would make great sacrifices in matters which we should consider unnecessary, in order to keep up a creditable appearance. It is not very easy to illustrate this by examples, but all these drawings of French doors of a superior class show them to be more spacious and lofty, and very much more richly ornamental than anything that would, under similar conditions, be executed here. In the matter of ornament, I think you will see a strong tendency to excess, some of the designs for external doors present-



DOOR AT ST COSMO

ing an incongruous mixture of details that seem put in merely to cover up every inch of the surface, leaving no repose for the eye. I am fortunately able to show two cases where the English and the French designer came into direct contact. My own house was built some sixty years ago. The more prominent parts are decorated with very nice and satisfactory Greek details. As to those parts that are less prominent, one would feel ashamed to confess a lack of interest in anything so thoroughly respectable. A few years later the then owner had the chief rooms redecorated by French artists in the style of Louis XV. I show the original and the altered designs side by side. In the dining-room the flat panels of a good ordinary English door have had an enriched bead planted on to imitate a raised panel. All the plain mouldings have been replaced by enriched work, and the whole is finished with a highly-ornamental cornice and a broken pediment enclosing a vase of fruit. I am not aware of any principle of art that will support any part of this decoration, but all ordinary people seem pleased with it in its place,—and I am blessed with the friendship of many ordinary people. In the drawing-room floor each door was heightened by 10 in., and a highly-decorated panel was placed over it enclosing an oil painting,—the height of the whole composition being thus raised from 7 ft. 2 in. to 11 ft. I do not know where to find a more choice example of an utterly indefensible style. The panels are made to dance and twist out of all shape. Shells, scrolls, and vagrant sprays hook on to each other; and mouldings and ornaments are alike covered with gildings, all being exceedingly well executed. I have been asked by a serious-minded friend how I can possibly eat, work, or sleep in view of such monstrosity. Fortunately, I can laugh at it; and I am now told that it is coming into fashion again, which is perhaps a pity.

Leaving these considerations of what other people have done, I will now venture some opinions of my own on the whole subject,—I do so in the expectation, and indeed in the hope, that many will differ from me, and feel ready to support other opinions of their own.

I address several of us will have to design or to execute work of this kind, and will feel desirous of bringing serious thought to bear upon it. I hope no one will have the idea that questions of taste,—about which there is so much dispute,—are no concern of his. Many times have I heard from working men the notion that "taste" is something beyond their province, and impossible to be acquired,—a very mischievous notion. In all ages, when good art flourished such as everybody now admires, the good work must have been not only executed, but to a large extent designed, by the workman. Some of the best work of all kinds that has been done in our own time is due to workmen who, if they have not actually executed, have, at least, designed and directed it. There is infinitely more opportunity now and in the future for the ability to be acquired by the men for whose advantage these lectures are given. As I am privileged to give the last of this course, I will offer a few hints which, I trust, will not be out of harmony with anything that my colleagues who have preceded me have said. To design so as to please and interest those who are judges of work, or who possess what is called "taste," you will have to take a great interest in the matter. Being possessed of some practical experience in work, and of skill in the execution of it, you should search out the most admirable examples of similar work. Of all the lectures that I have heard,

those have been most useful to me at which I could see such examples, and hear of others. There is very ancient authority for this. In the splendid shining palace, of which I have more than once spoken, there sat the lady of the house with her maidens before the beaming fire, spinning and weaving the sea-purple threads of wool "wondrous to behold." They were skilled above all other women in weaving the web, "for Minerva had granted to them exceedingly to be acquainted with beautiful works, and endowed them with a good understanding." These seem to be the two things needful. The man who has them need not tie himself down to the views of other men, which will change from year to year, but will be able to contrive beautiful work that will interest others, though he himself may change. I am sure that if a few workmen were to combine and make the subject of doors or of doorways their study, meeting occasionally for exchange of information and ideas, they would acquire in a few months a knowledge of, and an ability in, designing and executing work of this kind that would be very beneficial to themselves, and useful generally. And I should be very glad to help forward such an undertaking so far as I can.

I will now offer the observations that occur to me on the practical and artistic details of doors.—First, it will be observed that the ordinary English door as I have described it,—and as we all know it,—is an object upon which the smallest possible amount of art or skill has been employed. Every part of it is prepared by machinery, and it only requires to be put together. A young apprentice rapidly acquires the art of doing this, and an experienced joiner can hardly improve upon it. When a door requires to be rather more handsome than is common, a heavy bolection moulding is used, and this is about the end of the ordinary stock of ideas on the subject. That is a condition of things that one is desirous of improving, so far



as may be possible. I think the thickness of a door should not be very much diminished in imitation of foreign examples. I rather suspect that our people are less gentle in their movements than some others. A thickish door will take better mouldings and better hinges, and is less injured by the cutting away for a mortice lock. Upon this point, I may notice a lock which some one has sent me, pointing out that it only requires a hole bored with an inch auger. He tells me I could myself fix it complete in fifteen minutes. I have no doubt that I could, but I cannot afford to make a failure, so I shall not try. If it continues to work as well as it does now, as a sample, it seems a very useful invention. I should not copy the foreign fashion of hanging the door out in front of the opening, but in a deep rebate behind the face of the grounds; the edges of door and jamb lining might have a small quadrant hollow, worked on them, as I have shown in a foreign example. As regards the hanging of outer doors that are mostly kept open, I prefer the mode known as "warehouse fashion" (fig. 15), because it looks well and throws the door back quite clear of the opening. The next question is the panel. Not only for the sake of variety, which is of itself a distinct advantage, but as a means of producing a pleasing effect, some of the foreign plans of wide panels might be adopted. The lock rail should remain where we put it, one or two panels being put over it. The panel should more often be raised, either on the bevel, or with a simple flat border of  $1\frac{1}{2}$  in. to  $2\frac{1}{2}$  in., and a very small moulding at the rising. The mouldings for such a door should never be the wide flat ogee that looks as if it were nailed to the panel, and often is so nailed, but a short and deep ogee that seems to belong to the framing. For a good door I suggest a sinking in the panel instead of having it raised. This is well shown in bronze in the doors from the Church of St. Cosmo (fig. 16), but can be seen in many good outer doors, particularly in rather old-fashioned streets. The part so sunk is an admirable position for ornament, which may seem overdone if it occupies the whole panel. Not until you have decided to have the panels richly finished would I think of using a bevelled moulding which may enhance the effect of a handsome panel, but only looks coarse when it surrounds a plain one.

The design of the panel-door lends itself to the employment of two, three, or more colours or of different kinds of wood in the framing, the mouldings, and the panels. There is scope for taste. I think the framing should be quiet in colour and free from pattern, and the mouldings of decided colour. If they are not part of the framing, that is a reason for making them different in colour or material. The place for ornament in a panel door is the panel. I remember a room in a fine country house in which the owner desired to use his ample stock of oak so as to produce a handsome effect. He not only had the panels of the wainscoting cut so as to show the silver grain, but the whole of the framing as well. I have explained in this room how this is done at some extra cost in sawing. The cost was of no consequence, but in the opinion of every person of taste he had spoiled the effect of the wainscoting by making the framing as rich as the panels, and thus fatiguing the eye by an abundant exhibition of patterns with no plain space between. The plain surface of a raised panel is the place for a piece of very beautiful veneer or a higher class of ornament. Other kinds of ornament may be so used, such as inlaid work in geometrical or foliated patterns, or even in pictorial designs. The sunk centre of a panel is a still better place for flat ornaments of a choice kind. I exhibit some specimens of beautiful work, which we may call Saracenic, that have been kindly lent by Messrs. Liberty & Co. of Regent-street. A visit to the South Kensington Museum will enable you to examine at leisure a great variety of inlaid work and wood mosaic in the furniture department and in the Jones collection. You will see not only hard woods in different colours used in the patterns and in the pictures, but ivory and mother-of-pearl. This probably indicates the still more extensive use of such rich materials in very ancient times, and the very slight amount of exaggeration that the old poets and dreamers used in their magnificent descriptions. One of Le Pautre's designs, which I have enlarged, shows a painted landscape in the large upper panel, a work which, if well executed, might perhaps have been better put

on a more secure place. Carving in low relief may be very fitly introduced in the panel. There is a very interesting example of this in Sir Gilbert Scott's entrance-doors to the Midland Station Hotel. Carving in high relief can only be fitly used in doors of the highest importance, and is apt to run into extravagance in figure sculpture. In the South Kensington Museum are the doors of St. Macloù at Rouen, and I exhibit an engraving of some doors of extraordinary richness from Burgos\*. In the same Museum is a small bronze German door from Sigmaringen, the mouldings being gilded, the panels silvered, and containing figures in high relief. There also you may see a copy of Ghiberti's doors, gilded and more like their original condition than are the actual gates at Florence. This work is criticised more severely than other examples because it is the most important and the most interesting of its class. It is easy to say that the groups and landscapes he has produced are more fitted for painting than for sculpture. To do something that is interesting without the least trace of extravagance is a task that has not been so very often accomplished, so the artist of to-day has a fine field before him. In avoiding that danger he will run an equal risk of doing something which nobody will give themselves the trouble to criticise.

We must not overlook two great elements of interest in doors,—costliness of material and magnificent dimensions. Though these are very far inferior in value to the art of the cunning craftsman, mean materials and insignificant size are much too often seen, and greatly detract from the interest of a work. The gold of which we read on ancient doors was probably like that in Solomon's Temple, laid on in thin plates, or may have been hardly more than thick gilding,—most of the ancient bronze-work was gilded. But Cicero accuses the Roman governor who plundered the Temple at Syracuse of taking away the gold knobs, which may have been like those from the door of the Pantheon, not for their beauty but because of their weight. Some of the ancient Roman doorways, as left by the mason, were 40 ft. or 50 ft. high and 20 ft. wide, the lintel being in a single stone. You might draw a four-storey house through such an opening. It was only reduced by the bronze jambs and faillight.

Thus, compared with other people, ancient and modern, we suffer from meanness and lack of interesting qualities in the work with which we are surrounded,—and we suffer unnecessarily. Rich men spend money in abundance on trivial and unworthy objects. We ought to tempt them with work that is interesting and will endure.

A few of my drawings have been brought here chiefly to show the unbounded honour that has been paid to the door in ancient, mediæval, and modern times. Though often comparatively mean in itself, it is surrounded with sculpture of the richest kind arranged in designs of magnificent dimensions that sometimes extend over nearly the whole front of which the door is the central feature. The subject of these portals or grand architectural entrances would be inexhaustible: the skill that has been lavished upon them shows the importance of our subject—the door. Not being now engaged upon such work as this, I have desired to treat it as an important branch of one of the grandest studies which the architect and the skilled workman can undertake. He who adorns the building helps to ennoble the town, adds interest to life, raises to higher thoughts, contributes to the honour and reputation of his people and his country. If to Minerva we owe our good understanding, may she also "grant us exceedingly to be acquainted with beautiful works!"

**Sayers Drinking Fountain Competition, Southampton.**—We are informed that sixty-eight competitors sent in designs for this fountain, and the premium has been awarded to Mr. Sydney Kelway Pope, of Southampton. The following in their order were the designs adjudged next in merit:—"Institution," Mr. W. J. Taylor, Southampton; "Sir Bevis of Hampshire," Mr. Alfred F. Gutteridge, Southampton; "Pro Bono Publico," Messrs. Lawson & Donkin, Bedford Buildings, Bournemouth; "Fides," Mr. Geo. H. Bailey, London; and a design bearing the emblem of a cross on a shield, by Mr. Charles Hide, Worthing.

\* See the Builder, Feb. 21, 1880.

## Illustrations.

### VIEW IN THE TEPIDARIUM OF CARACALLA'S THERMÆ (RESTORED).

THIS illustration, from a drawing by the late Professor Cockerell, is a restored view of the interior of the Tepidarium in the Thermæ of Caracalla at Rome, according to Professor Cockerell's idea of the original architectural design of this great hall.

The drawing, of which we believe no print has before been published, is in the possession of the Royal Academy; the present Keeper, Mr. Calderon, has kindly permitted it to be photographed for our pages, at the suggestion of Professor Aitchison, to whose valuable lectures on Roman architecture, lately printed in our columns, it forms an appropriate pendant.

### ST. MARY'S CHURCH, WORSTEAD.

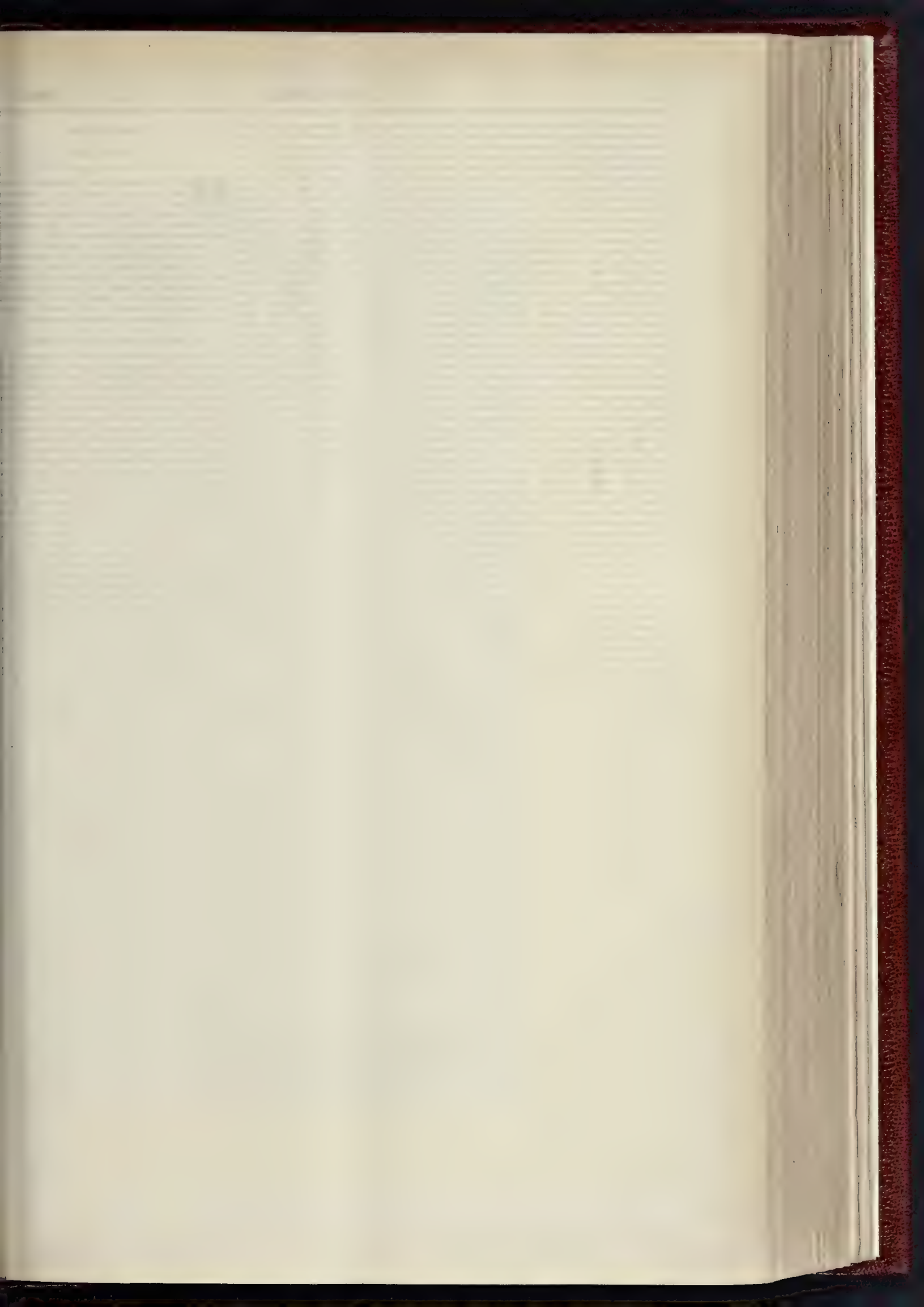
WORSTEAD, now only a small village, was in the time of its prosperity a town of some importance in East Anglia. The date of the foundation of the church is not known, the first mention of it being in a deed of the early part of the reign of Henry III., when the patronage was given to the priory of Norwich. The next thing recorded of importance is that in the second year of the reign of Richard III. the chancel having been burnt, was rebuilt. The church consists of a nave and chancel with aisles, a fine west tower, south porch, and vestry.

The nave has five bays of Decorated character. Originally it had no clearstory, as is proved by the line of the original roof, still visible on the tower. The present clearstory and roof are Perpendicular in character, and are fine specimens of that style. In the windows of the clearstory the plane of the glass is placed in the centre of the wall, which is not a common position in Norfolk; the jambs, both interior and exterior, being moulded with one large shallow casement which, thus simply used, has a good effect. The roof is a good example of the hammer-beam type, but it had so thrust out the walls as a period apparently not very much subsequent to its erection as to necessitate the addition of flying buttresses to support them.

The aisles are undoubtedly of the transition from Decorated to Perpendicular, but one is surprised to find, after carefully cleaning from them the whitewash in which they are buried, that the mouldings of the caps and bases of the rereshafts of the windows are of apparently much earlier character.

The tower is a good specimen of a Norfolk tower of the late Decorated period; but its beauty is considerably marred by the heavy character of the pinnacles, which were erected in 1861. The basement is one of the best of its kind, presenting a combination of flint panel-work, sunk quatrefoils, and bold, well-profiled mouldings; the quatrefoils are slightly undercut, which gives them a peculiarly bold appearance. The west doorway and window exhibit an early example of the union of these two features into one composition. One might take the builders of this tower made, in placing a staircase in the thickness of the wall at the north-west angle, which has materially weakened this part, and, consequently, the whole tower. All the parts described above are built with excellent workmanship; the dressing are of a shelly oolitic limestone, which has weathered exceedingly well; the walling is of flintwork, with galletted joints; the flint appears to have been obtained from the beach about five miles distant, and are all carefully split, and in the panel-work carefully squared. The mortar, however, does not appear to have been first-class, as it has weathered away, so unless the joints are soon pointed the splendid flint facing will soon be utterly ruined. The chancel presents many curious and interesting points. Compared with the remainder of the church it is badly built, and has at various times undergone extensive repairs. The rebuilding referred to in a deed of the second year of Richard II. appears to have been extensive repairs, rather than rebuilding from the foundations, in which old materials were extensively used. This would account for the Decorated and Perpendicular capitals which are found side by side on the shafts on the mullions of the east window, for the early bowtell between two deep hollows on the jamb of the same, which changes abruptly into a shallow hollow at the springing of the arch, and for the various differences

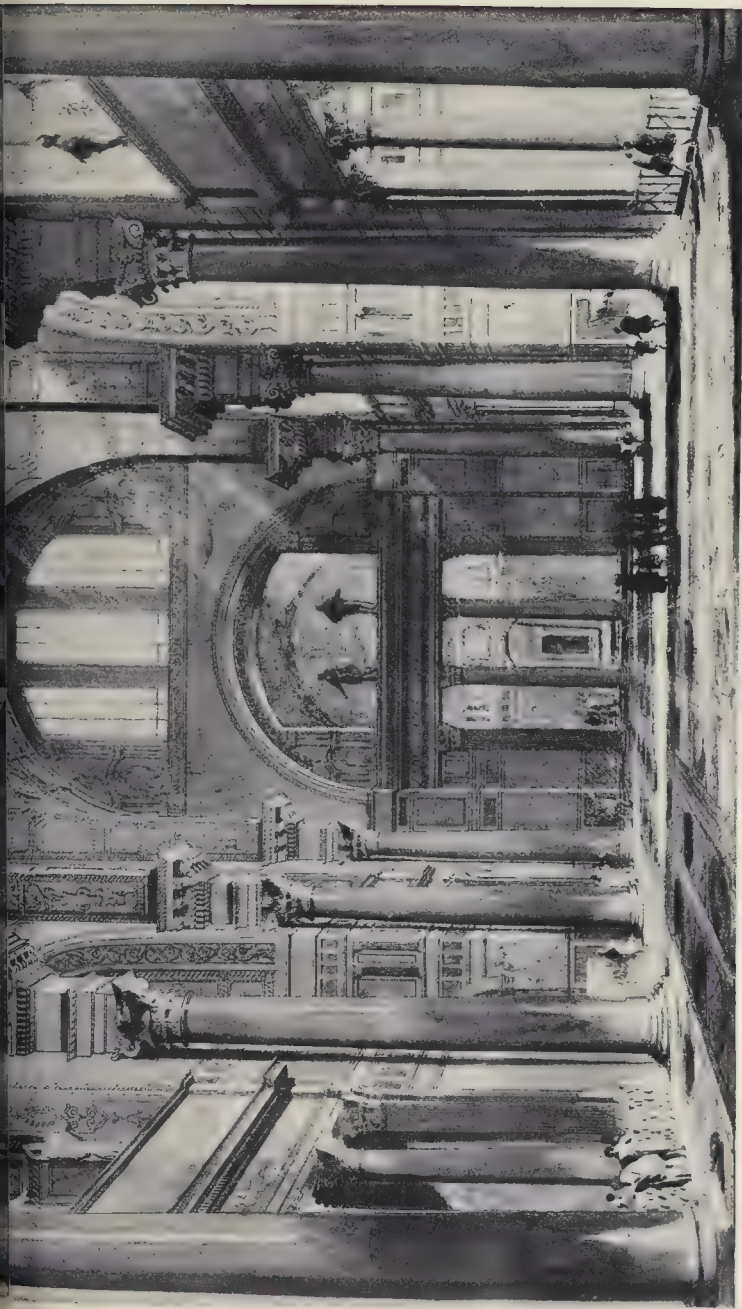




THE BUILDER. MARCH 23, 1889.





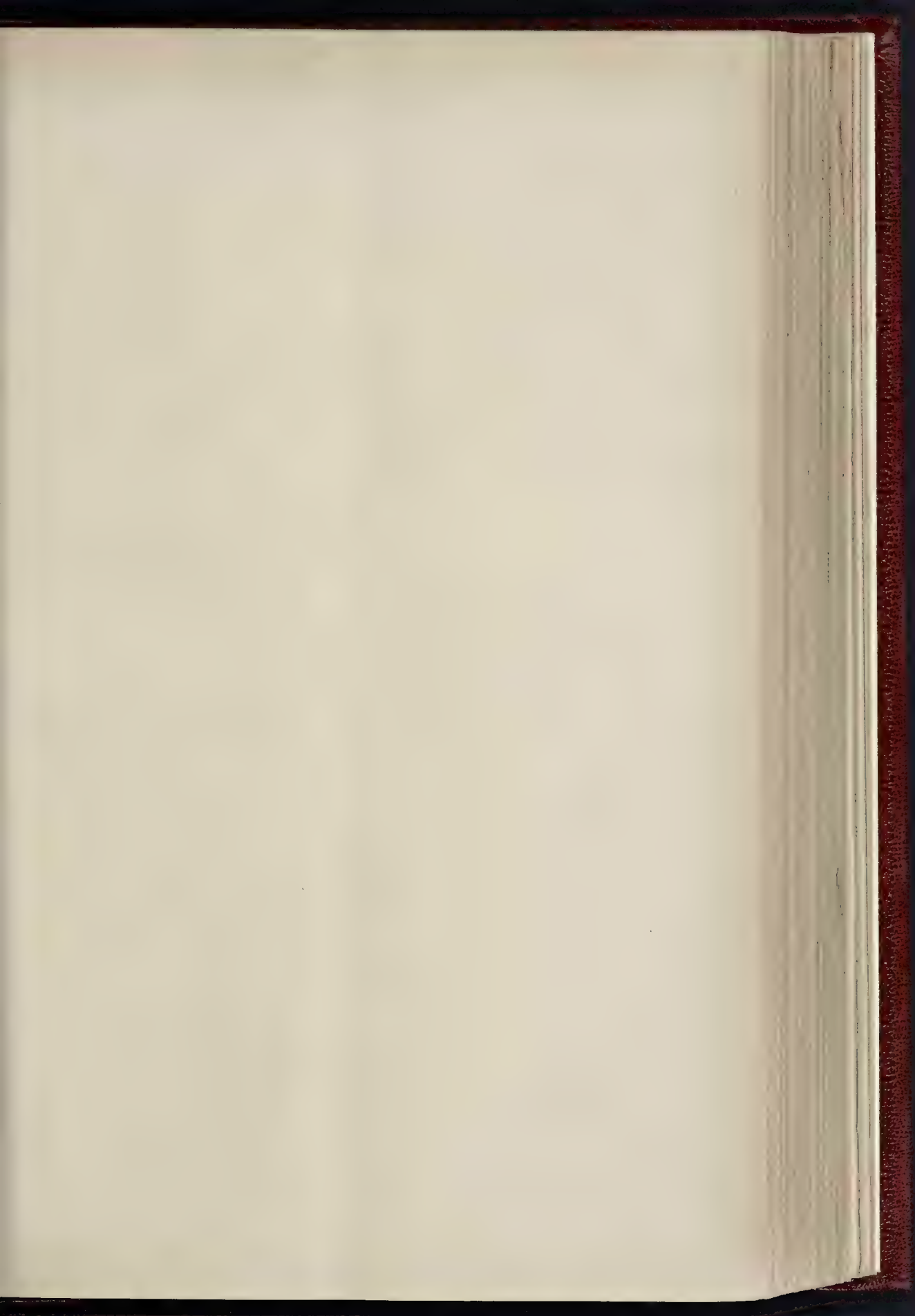


F. O. W. G. & S. E. L. L. G.

VIEW IN THE TEPIDARIUM OF CARACALLA'S THERMÆ, ROME.  
As restored by the late Professor Cockburn, R.A.

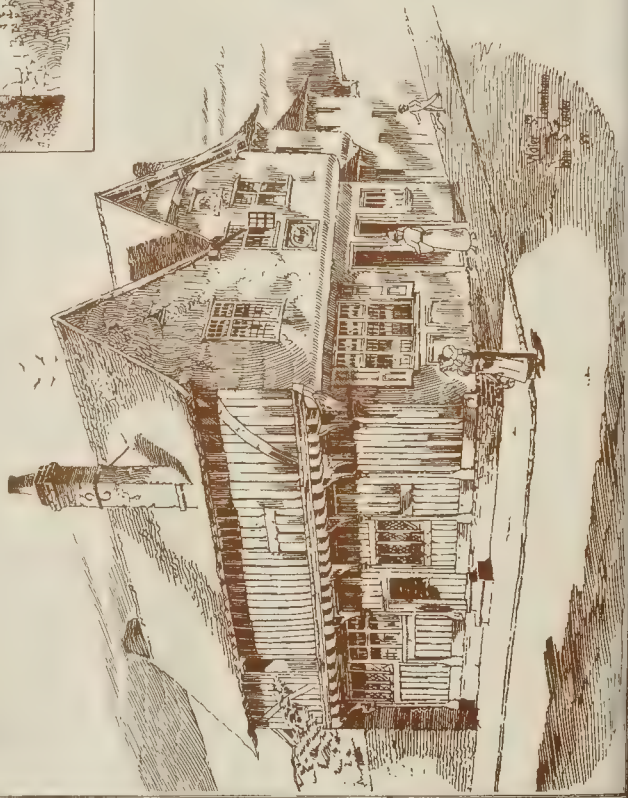




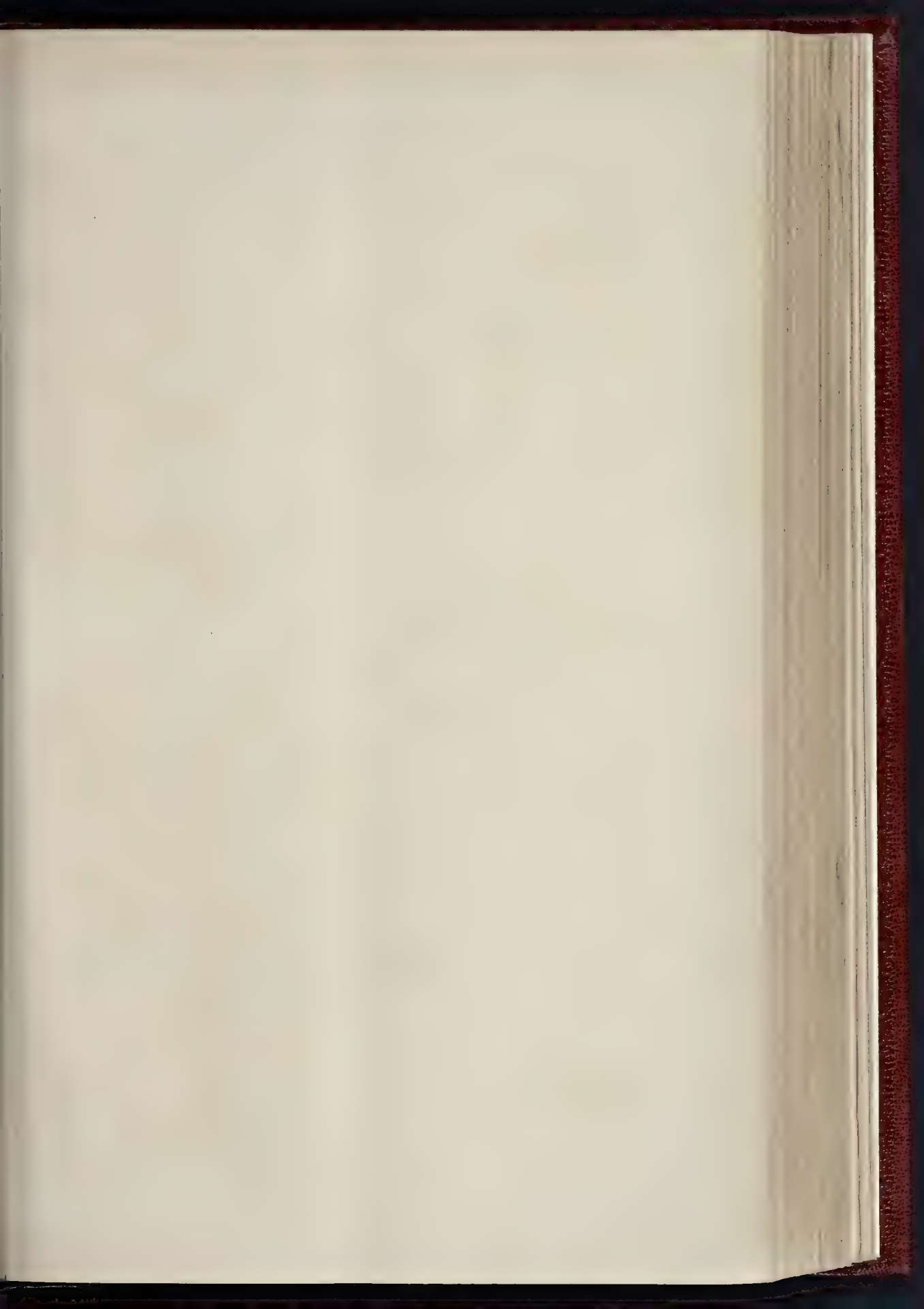




Wayside Notes  
in  
East Anglia  
by  
John S. Corder



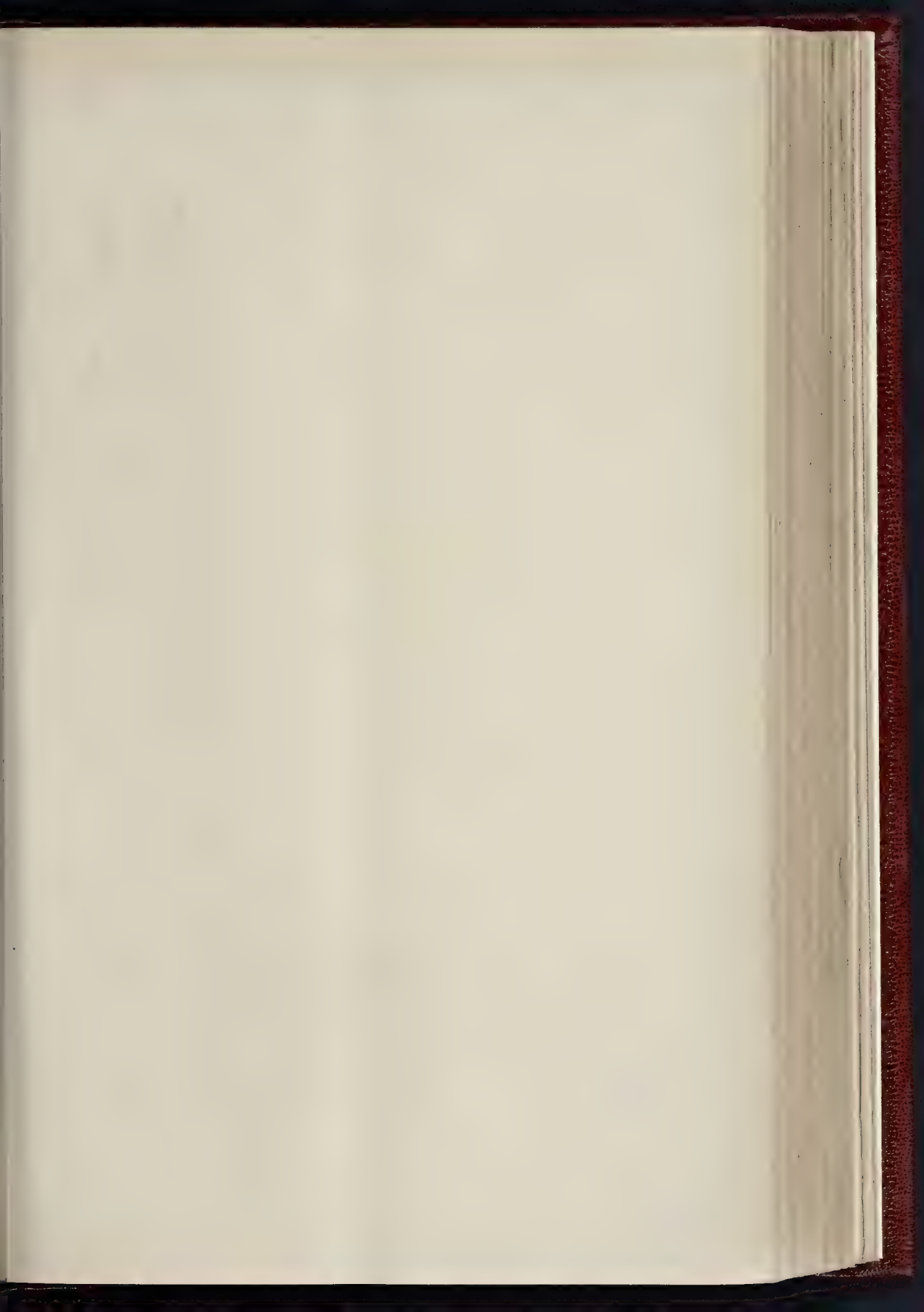




A detailed black and white engraving of a large, multi-story building, likely a school or institutional structure. The building features a prominent central tower with a pointed roof and a small spire. The main body of the building is composed of several wings, each with multiple windows and decorative architectural elements. The building is surrounded by trees and a fence. In the foreground, a person is standing near a small structure, possibly a gate or entrance. The sky is filled with clouds.

PARSONAGE CHURCH OF THE GOOD SHEPHERD COURTHOUSE ROAD HAMPSHIRE





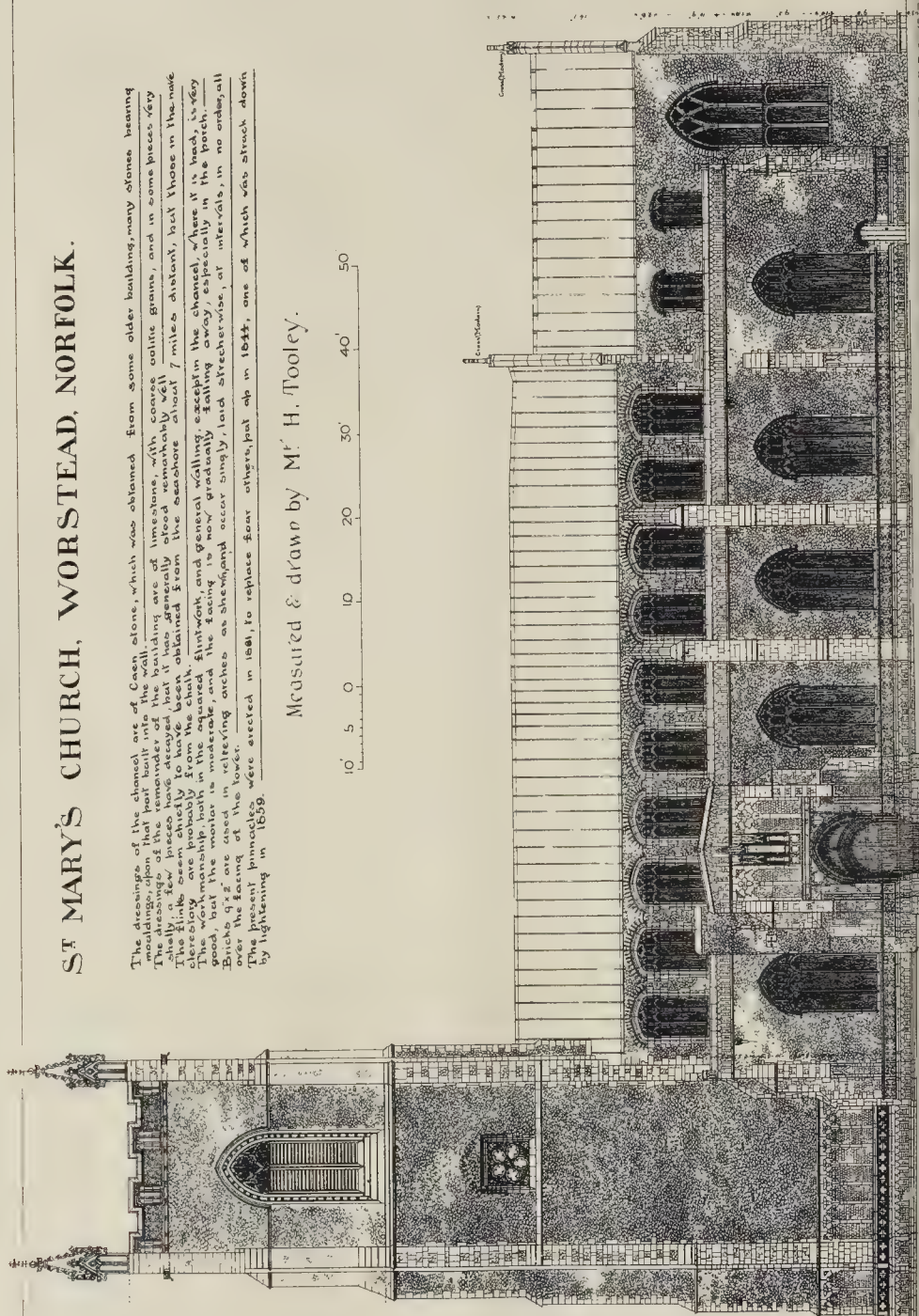
THE BUILDER, MARCH 23, 1889.

# ST MARY'S CHURCH, WORSTED, NORFOLK.

The dressings of the chancel are of Caen stone, which was obtained from some older building, many stones bearing mouldings, upon the top of the wall, and the remainder of the building are of limestone, with coarse oolitic grains, and in some pieces very shelly, a few pieces have decayed, but it has generally stood remarkably well. The flintwork has been chiefly obtained from the sea-shore about 7 miles distant, but those in the nave are from the local quarries. The masonry is of the Thirteenth century, and is generally good, but the mortar is moderate, and the facing is now gradually falling away, especially in the porch. Bricks 9x2 are used in relieving arches at the tower, and occur singly, laid straightwise, at intervals, in no order, all over the facing of the tower. The present pinnacles were erected in 1881, to replace four others, but one of which was struck down by lightning in 1859.

Measured & drawn by Mr. H. Tooley.

10' 5' 0' 10' 20' 30' 40' 50'

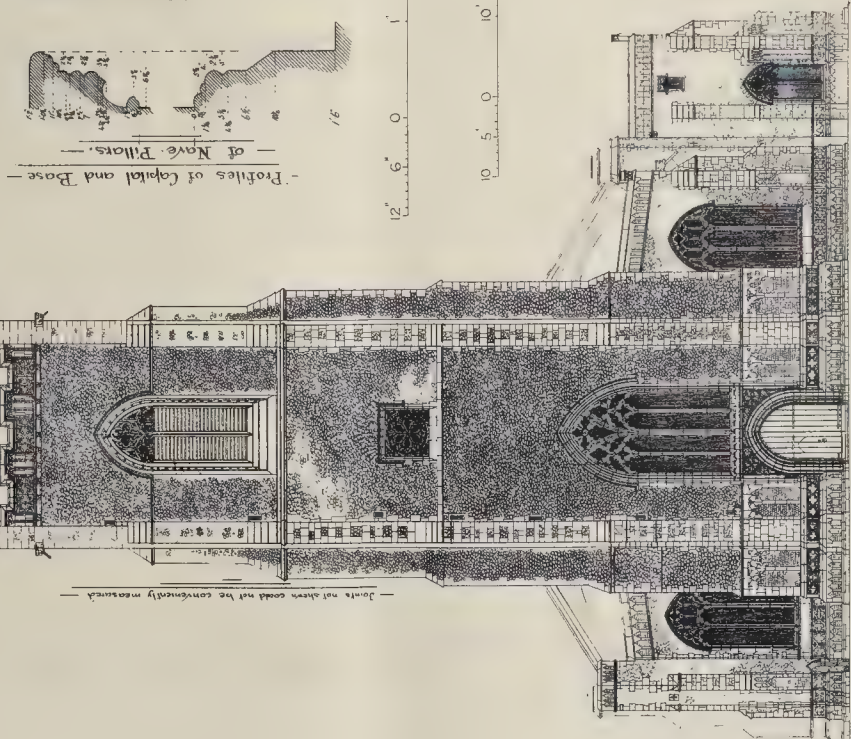




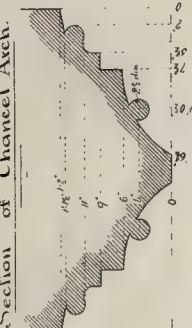
# ST MARY'S CHURCH, WORSTED, NORFOLK.

Measured & drawn by M<sup>r</sup> H. Tooley.

Pinnacles erected 1861



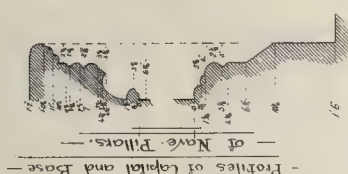
West Elevation



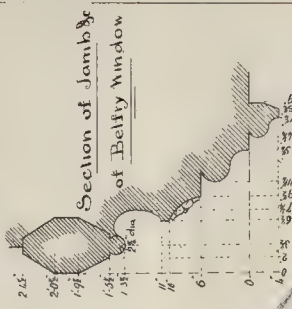
Section of Chancel Arch.



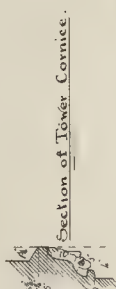
Section of Nave Arches.



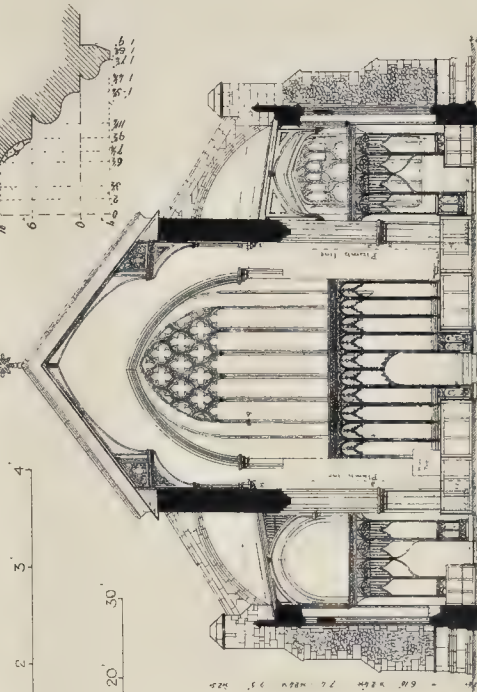
Profiles of Capital and Base of Nave Pillars.



Section of Jamboe of Belfry Window



Section of Tower Cornice.



Cross Section

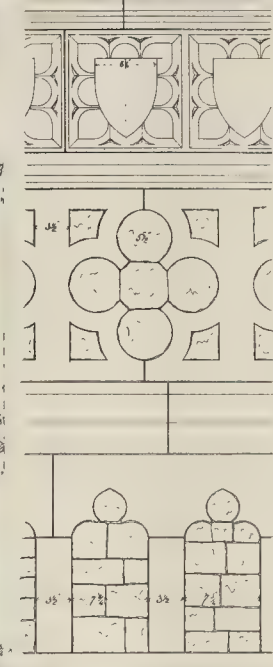
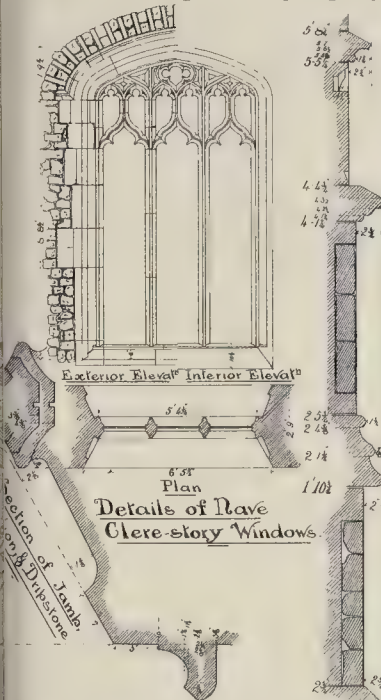




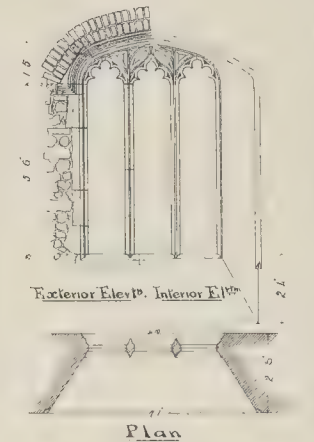
# ST MARY'S CHURCH, WORSTED, NORFOLK.

Details.

Details of Chancel Clerestory Windows.



Basement at East end of South Aisle.

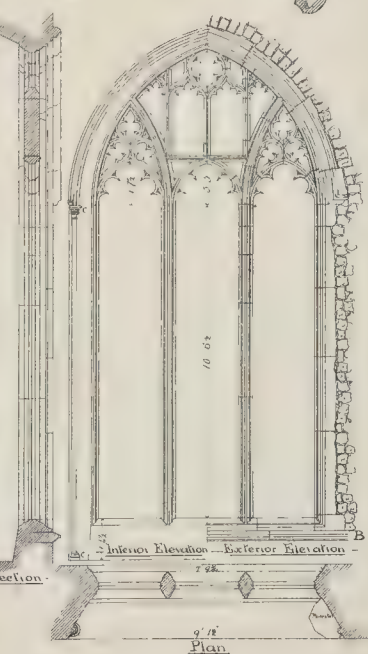
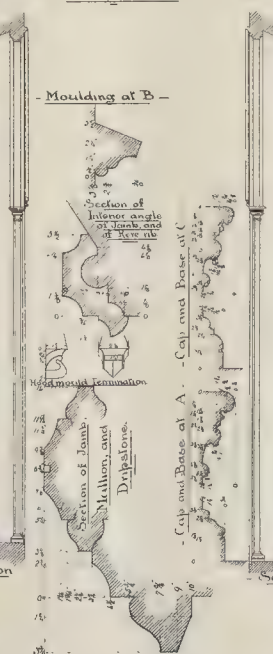
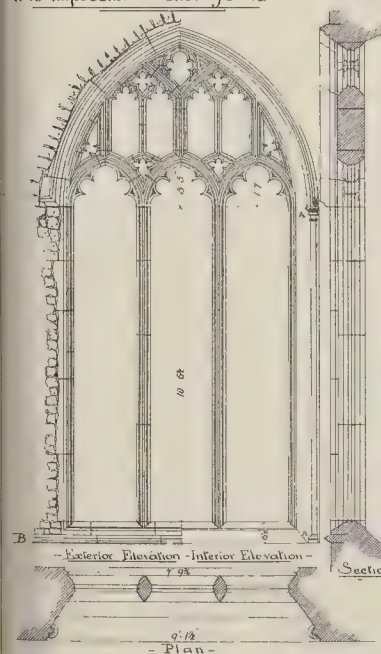


Plan



Section of Jamb Mullion, and Dripstone.

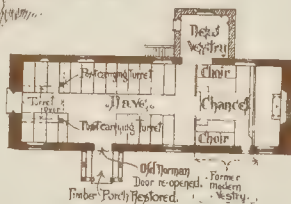
- Details of Aisle Windows. -



Measured & drawn by M<sup>r</sup> H. Tooley.

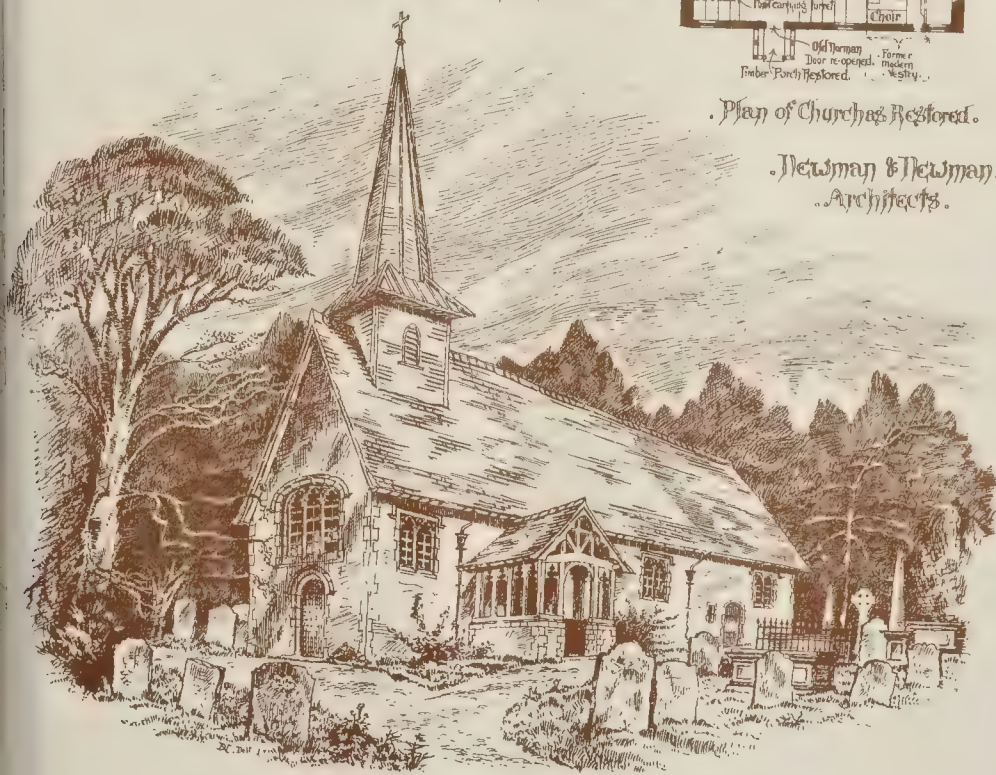






. Plan of Churches Restored.

.Newman & Newman.  
Architects.

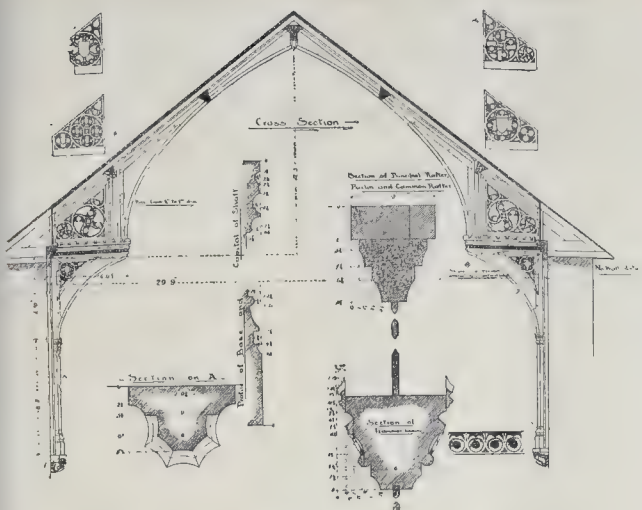


.View from South-West.

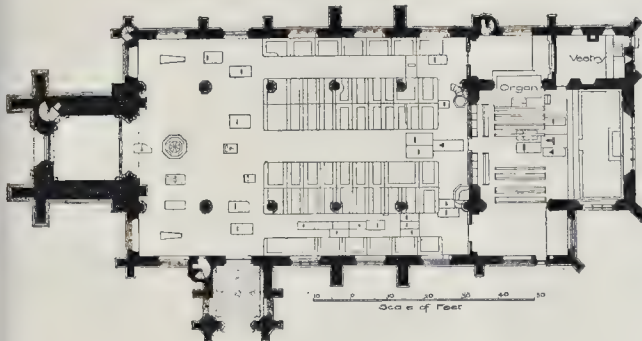
PHOTO LIND SPRAGUE & CO 22 MARY NS AVE FANNIN ST LIND N EC







Worstead Church.—Elevation and Details of Roof—principal.



Worstead Church.—Plan.

manners in which the walls are built. There are no footings to the east wall, which ends about 3 ft. under the present level of the soil. The font (illustrated in Rickman's book) is very fine, as still are the screens, in spite of bad usage. The chancel-screen still retains much of its gorgeous painting, the small ornaments and the diaper, which form the backgrounds to the figures in the panels, being painted in such a manner as to have considerable relief, so that in some cases, where a coat of yellow paint has hidden the beauty of their colouring, the form of the ornament is still to be traced. In many places where the whitewash has unsystematically been cleaned from the walls traces of colour decoration are to be seen, but all are in a very ruined condition. A few small brasses still remain intact, but many stones have had the brasses stolen from them.

PARSONAGE, CHURCH OF THE GOOD SHEPHERD, HAMSTEAD.

THE view of the parsonage of the Church of the Good Shepherd is taken from the west, and is facing the ground where the permanent church is to be, sketch drawings of which are made. The parsonage is in course of erection, the builders being Messrs. Rudd & Son, Grantham, who are building the large parish church at Horsey for the same architect. The parsonage is situated at the corner of Savernake and Courthouse roads, and is on Lord Mansfield's estate; it is close to the Gosport Oak Station. The materials which are being used are red Suffolk facing bricks, with Bath stone for windows, doors, chimneys, &c. The roofs are covered with Broseley tiles, with the exception of that of the bay over drawing-room, which is of lead, and the roof over the octagon turret: this is covered with small green

slates. The floors in the principal rooms are laid with deal wood-block, and a wide margin round with walnut-wood blocks. The passages are paved with Hobman's mosaic tiles. The architect is Mr. James Brooks.

WAYSIDE NOTES IN EAST ANGLIA.

Lavenham.—As I stated in my former short notice, which accompanied the first sheet of "Wayside Notes" (see *Builder* for Aug. 11, 1888), the town of Lavenham owed its prosperity in the fifteenth and sixteenth centuries to the great woollen manufactures which were then carried on there, and also to the protection of the De Veres, Earls of Oxford. Though now only a decayed town, sufficient evidence remains in its buildings to indicate the quondam opulence of the place; and thanks to the durability of their construction, the town preserves much of its pristine picturesqueness, and is beautiful even in its decay. As will be seen, the construction of the buildings consists of solid oak framing, morticed and tenoned and pinned with oak pins, filled in with clay daubing and wattles, resting on a low foundation of brick and rubble. This framing was always shown externally, and very often inside the rooms also; but as the oak decayed, it was found expedient to adopt stringent measures to exclude the weather, and external plastering was resorted to, covering the old framing. This plastering often took a very elaborate form, as in the sketch shown in the right-hand top corner of the sheet; whilst in the building in the left-hand bottom corner the plastering of the eastern gables is quite devoid of all decoration save a small panel, with the date, 1696, enclosed in a wreath of leaves. These two houses afford examples of the kind of dwellings in which the wealthy woolstaplers once resided; and though their accommodation would not altogether quite

coincide with our modern ideas of fitness, yet they were, doubtless, residences of no mean order.

Bramford is a Suffolk village situated on the navigable river Gipping, about 2½ miles N.W.-by-W. of Ipswich. The surroundings are quiet and pastoral, the flat meadows which fringe the stream affording excellent grazing-grounds for flocks and herds, and many beautiful subjects for pencil and brush may be obtained in the vicinity. The church (St. Mary) has many interesting points; the present erection dates from the Early English period, whilst many details of Decorated work are to be found in the fabric,—noticeably the stone rood-screen between chancel and nave. This church, with the Berewicks of Burstall and Albrighton belonging to it, was given to Battle Abbey by William Rufus, and the monks had the rectory and were patrons of the vicarage till the 33rd of Henry VIII., when it was granted to Christchurch, Canterbury, in exchange. The Dean and Chapter of Canterbury are now the patrons, and the Ecclesiastical Commissioners hold the great tithes of Bramford and Burstall.

Aveley.—This church is another example of the stone towers of Essex which are to be found on the banks of the River Thames, up which river the stone found an easy means of transit.

Harwich, from its conspicuous and important position, is a town which has witnessed many and great vicissitudes. Situated as it is on an arm of land overlooking the expansive estuary of the rivers Orwell and Stour, the military importance of its position will be easily recognised, whilst its harbour affords convenient anchorage for craft of all sizes. Twelve miles of lovely river separate Ipswich from Harwich, and the trip is easily accomplished by steamers which ply between the two places. Historically Harwich is most interesting. Past it sailed the victorious Vikings and Danes on their way to sack and pillage the town of Ipswich, and many royal personages have landed and embarked from its shore. The earliest recorded royal visit was that of Isabel, Queen of Edward II., who landed in 1326, with a body of insurgents, to oppose the King; and again in 1340, Edward III. embarked to assert his rights to the regal diadem of France, only to return later, discomfited and defeated, to the same port, where he rallied and reorganised his forces and again sailed forth, this time to return a proud victor. Henry VIII., Elizabeth, Charles II., and the two first Georges, all paid visits to Harwich, and William III. passed through twice on his way to and from Holland. Opposite Harwich, on the Suffolk side, is Landguard Fort, of which redoubtable fortification Pepys records in his Diary, the Dutch landed here about 3,000 men and attacked it, but were "beat off thence by our big guns." A walk through the streets of Harwich conveys ample evidence of its high antiquity, and many buildings, both interesting and historical, remain to gladden the heart of the studious and observant. The principal buildings in the sketch are the church and the Great Eastern Hotel. The former is a brick erection, rebuilt on the site of a former ancient edifice, and is a conspicuous mark from land or sea.

JOHN SHEWELL CORDER.

RESTORATION OF ST. ANDREW'S CHURCH, KINGSBURY.

THIS ancient church, a description of which appeared in the *Builder* some time ago, has now been restored. The chancel has been thoroughly repaired and restored by Mr. Ewan Christian, acting for the Ecclesiastical Commissioners of England; and the rest of the church, including the addition of a new vestry and heating chamber under,—the vestry opening into the church by an arch, in which the organ is to be placed,—has been restored by Messrs. Newman & Newman. The works both for Mr. Ewan Christian and Messrs. Newman have been carried out by Messrs. L. H. & R. Roberts.

Various interesting discoveries have been made during the progress of the works. Upon the south wall of the church being stripped, of plaster internally and cement externally, an old Norman arch was discovered, which has been opened out and carefully restored, and an open-timbered porch is to be shortly erected, the design of which has been taken from an old engraving of Kingsbury church found in the Guildhall Library. In the north and south walls of the chancel, six earthenware square pipes were found, three on each side, laid side



by side, with their openings towards the face of the walls, and pierced at the sides by oblong holes opposite to one another. Remains of ancient frescoes were found upon the jambs of the east window, and also upon the other walls of the church, but they were all too much destroyed for preservation in any way. A very small single-light window was found at the side of the priest's doorway, and very low down in the wall. This has been opened out and carefully restored. All the quoins of the windows and doorways throughout the present church are pieces of much older work, which have been turned round and reworked to form the present Late Perpendicular work which exists throughout the church. Some curious dog-toothing was found built into the wall, apparently of a very much richer design than any of the present details of the church. Roman work is plainly visible in some parts of the walls. There also were found two recesses, probably aumbries, each side of the chancel near to the altar, which have been opened out and repaired; both had wooden lintels for their heads, apparently of great age. The curious bell turret at the west end has been left as before, with the exception of the gallery, which has been entirely removed; and it is hoped that before long, when funds permit, the bells will be re-hung, so that they may be rung, which at present is not possible. The roof, which was formerly ceiled in, has been opened out and boarded with oak at the back of the rafters, which are strutted throughout to each rafter; this has made an immense improvement to the interior of the church. At each angle of the building the walls are built upon stones of an enormous size. The external face of the walls has been covered with rough-cast, the quoins being left visible. The tracery throughout has been most carefully reinstated where necessary. The heating has been carried out by the Thames Bank Iron Co., and it is hoped that before long funds will be forthcoming to reseat the church with good oak seats, and that a rood-screen may be erected which formerly existed in the church, and that the font may be recovered, which is now in the garden of a neighboring house.

The object of these few notes is to show that the restoration has been carried out in a true conservative spirit, all old work being carefully preserved, and the new work being entirely in character with the old, which, we venture to think, will be seen upon reference to the sketches accompanying this description.

NEWMAN & NEWMAN.

#### ANCIENT SCULPTURE IN BRONZE: STATUARY.

MR A. S. MURRAY, of the British Museum, delivered the third and concluding lecture \* on "Ancient Sculpture in Bronze" to the students of the Royal Academy, on the 25th ult. As a preliminary, the lecturer said that he had recently had occasion to examine a number of specimens of ancient silversmiths' work in the British Museum, in company with a skilled silversmith who, with an extensive business on his hands, had yet found leisure to inquire into the processes employed by the ancients, and who, as the result of long experience, declared that there was no process employed now that was not known to and practised by the ancients; we might carry some of the processes further, that was all. The same was true, the lecturer believed, of modern work in bronze; we might carry some of the processes further, but in actual knowledge we had not surpassed the Greeks. Nevertheless, there might be some instruction to be gained by looking back on the early times, when the Greeks were engaged in working out for themselves the problem of how best to execute a work of sculpture in bronze. The oldest example to which he was able to point was a bust which, strictly speaking, was not Greek, it having been found in an Etruscan tomb, and being, no doubt, of Etruscan workmanship of about the year 600 B.C. At that time, however, Etruria and Greece had so much in common in matters of art, or, at least, of artistic processes, that what was true of the one country was true of the other. Moreover, the process by which the bust in question had been produced answered exactly to the literary records we possessed of the oldest statuary of bronze in Greece. It was made of thin plates of bronze, hammered up into some approach to human form, and then

fastened together with pins or nails, so as to form a complete bust. There was in Greece a statue made in that manner which Pausanias saw and described, calling it the oldest statue he knew of. So also, at Olympia, there was a famous colossal figure of gold made by the same process at the expense of the ruling family of Corinth, the Kypselidae, in the early part of the seventh century B.C. Therefore, failing remains of such sculpture from Greece itself, the lecturer thought he was justified in using as an illustration the contemporary bust from Etruria. Perhaps, though, he was wrong in calling it a "bust," because the Greeks did not sculpture busts, in the ordinary sense of the word, till at a late period of their art,—till the time of Alexander the Great and thereafter. The idea of the Etruscan bronze in question,—not to call it a bust,—appeared to have been derived from a class of vases which the Phœnicians were fond of,—tall cylindrical vases, finishing at the top in the form of a bust of their goddess, Astarte or Aphrodite. In the tomb in which the bronze was found there were also discovered two such vases in alabaster, which clearly had been imported from some place where Phœnician influence was powerful. According to tradition, bronze casting was invented or introduced in Greece somewhere about 600 B.C. No doubt casting had been practised long before that date in Assyria and Egypt,—at least, casting in the solid. There might be seen in the British Museum bronze statuettes from Assyria, cast solid, and bearing inscriptions which placed their date about 2250 B.C. Possibly there were examples from Egypt also of a similarly high antiquity. But what we had to do with was hollow-casting. With that invention the names of two sculptors were always associated, viz., Theodoros, and Rheokos of Samos, of whom it was also said that they had studied their art in Egypt. We now knew, thanks to recent excavations, that where they studied was among the Greek settlers at Naukratis, in Egypt. The name of Rheokos was found inscribed on a vase there, and though it was not necessarily the very name of the sculptor, it nevertheless was to all appearance the name of some one from the same locality of Samos at that time. We might, therefore, take it that it was not directly from the Egyptians proper that Theodoros and Rheokos learned the art of hollow casting in bronze. It was in the first instance from their kinsmen in Naukratis. Diodorus Siculus (i. 98) described a specimen of casting by Theodoros and Rheokos in the form of a statue of Apollo in Samos, and claimed the original invention of the method for the old Egyptians. He said that the statue was made in two parts, divided vertically, each part consisting of a leg and half the torso. It was to be presumed that the two parts were brazed together by solder, a process which had been invented some time before by an artist named Glaukos, of Chios. This invention, coming as it did before that of casting, was hailed as an extraordinary advance on the old cumbersome method of fastening the parts together by pins or rivets, as in the Etruscan "bust" first mentioned, and in numbers of archaic bronze vases. Having described a great bronze vase which was placed in the Temple of Hera, in Samos, apparently about the time of Glaukos (Herodotus, iv. 152),—there being underneath the vase a stand formed by three figures, each 10 ft. 6 in. high,—the lecturer, passing on to the period about 500 B.C., said that we were now, thanks to the recent excavations on the Acropolis of Athens, fairly well informed as to the condition of sculpture in marble at that time. We saw from a number of statues found there that the prevailing taste was for gracefulness in demeanour and costume. That this was the prevailing taste also among the sculptors in bronze of that period was confirmed by a number of statues found at Olympia some years ago. When we reached the great age of sculpture in bronze,—the age of Polykleitos, Myron, and Pheidias, it was possible, by a laborious study of literary traditions, of contemporary works in other branches of art, and of copies made and modified in later times, to form perhaps a fair conception of what the works of those great men were like. But it was not possible, the lecturer thought, to express that conception in a way that would be intelligible without going over most of the details,—without, like a lawyer, calling endless witnesses to prove countless points, only, perhaps, to fail in the end. At the same time, there was in the British Museum a comparatively recent acqui-

sition, which, though it was only a fragment, would at least serve to indicate what was the general character of the art in bronze of those great times. He referred to the leg of a bronze statue, over life-size, of which Mr. Poynter had written that it was "of unsurpassed workmanship, and of that culminating period of art when, having freed itself from the archaism which hampered expression, it still retains that severity of style which shows that the idea to be expressed is still the dominant one in the mind of the artist, and that the study of beauty and the utmost skill of workmanship were still to him the means to an end, that is to say, of glorifying to the highest point the subject on which he was engaged." After a brief sketch of the steps by which art advanced in the early times of Greece, Mr. Poynter proceeded to say that "the grand simplicity of treatment which we find in the works of the Phœidian age was not the result of a conscious endeavour to simplify or conventionalise nature into typical forms; it was, so to speak, inherent in the archaism which the art had hardly shaken off; it was the still lingering tradition of the imperfect art which saw only generic forms and received only generalised impressions from nature. It is precisely at the point when this sense of the exalting value of noble and beautiful form flashed like an inspiration from heaven on the Greek school that the culmination of art was reached. Of such a period was the heroic figure whose leg we are considering. . . . Vigour and elegance of line; firmness of form; complete expression of all the subtleties of life and movement, yet with no insistence on trivialities of detail; perfect symmetry and proportion; and, as I have said, workmanship of unsurpassed beauty, are all combined in this superb fragment, which seems to me second to nothing which the Museum already possesses. The finish is that of ægem or a coin, while the largeness of treatment is such that it might have been hewn with an axe; and the play of the muscles is as full of spring and elasticity as life itself." The lecturer passed on to speak of the next stage of sculpture in bronze as represented by the head of Hypos, in the British Museum, which was quite possibly the head of Hypos which Pausanias saw in a temple at Sikyon, in Greece. It was found near Perugia, in Etruria, having been carried away from Greece by some Etruscan. It had been proposed to regard this head as a work of the time of Praxiteles, and there was much to be said for that view. After Praxiteles, the next great sculptor was Lysippos, in whose work there was to be found an excess of energy, the accompaniment of a period when the national life was sinking, though individuals here and there towered above it. Some bronze statuettes now in the British Museum, and found not far from the seat of the ancient oracle at Dodona, in Northern Greece, served to illustrate his manner. After his time, the sculpture of statues in bronze took much to figures of colossal size. Mr. Murray brought his lecture to a conclusion by some remarks on the ancient processes of gilding and enamelling on bronze.

#### THE ENGLISH RENAISSANCE.

SIR,—Permit me to reply to Canon Venables' letter in your issue of last week, and to assure him it was not any want of appreciation of Dance's work at the Mansion House, but simply lack of time, that made me unable to refer to it more fully in my paper at the Association. I found that the seventeenth-century works had taken up so much space that I had little left in which to do justice to those of the eighteenth century, and amongst others, the Mansion House; but in the course of the evening when drawing attention to the character of the woodwork in the old City halls, I also referred to the woodwork in the Mansion House, especially in the ball-room, which, like much of the work in the building, is full of the particular charm of English Classicism.

It was in no sense derogatory to Dance that I told Ralph's story about Palladio, but simply that it was worth in the way of "humour" or "contrast." I am glad English rather than an Italian design was adopted, and quite agree with Canon Venables in his dissent from the "vituperation" to which it has been subjected from time to time. It is the work of no novice, shipbuilder or otherwise, but of a man who thoroughly understood the spirit of the style as then practised, referred to by the name of "English Classicism."

I should like to thank Canon Venables for the interesting particulars he gives in his letter, and to suggest to you, sir, the illustration of the Assembly Rooms at York as a charming example of English Classicism.

While I am about it, let me acknowledge Mr. Ward's correction regarding St. Paul's in 1633.

\* For reports of the previous lectures see *Builder*, pp. 145, 203.



*Builder* of the 9th inst.; but, after all, it amounts to much the same thing. Compton was practically the one Bishop from start to finish, and one firm of builders built the cathedral, though it was begun by his father and finished by the son, which, with the one architect, are undoubtedly remarkable circumstances in every way.

J. M. BAYDON.

March 18, 1889.

#### THE "CATES" PARIS STUDENTSHIP.

SIR,—I think your correspondent "Prudentia" need have no misgivings as to a probable paucity of candidates for the above, as I already know of more than the stipulated number, who are intending to enter the lists. The condition referred to was laid down by the express wish of the donor.

FREDERIC R. FARROW,  
Hon. Sec. Architectural Association.

#### RUSTLESS IRON.

SIR,—As an old reader of the *Builder* I have read the article on the above subject in your issue of the 2nd inst. [p. 165] with interest, and as I have some knowledge of this matter I take the liberty of trespassing on your space with a few samples of work treated by the late Professor Barff's process. I will first say I have a few little articles given me by Mr. Barff himself when I visited some works at Kensington with him, I think in 1878. There are the hinges, latchwork, lamp brackets, suspenders, and altar-rail standards at Holmby St. Mary church, as built and given by the late G. E. Street. At Kingston Church, in Dorsetshire, there is a fine wrought-iron pulpit, altar standards, hinges on the doors, and casket at the Vicarage, all treated with the same process. In London, at the Guards' Chapel, there are the altar standards and rails, all wrought iron, also the chancel gates. These have, I believe, been decorated since, so that one may form an opinion as to ground for decoration. These are works of all of which I have a personal knowledge, and some of them are the work of my own hands.

The great feature to my mind is that the work of the blacksmith's hammer is as definite after treatment as before, which is largely lost in painting, however carefully done.

The one thing to be observed is very careful treatment afterwards, as the heating process anneals the iron, and thereby softens the same.

As in the case of hinges, care should be taken not to overdrive the nails, as the oxide chips off all round the holes, and leaves these parts to rust badly.

Scrolls, &c., should not be bent about more than can be helped, as the oxide will crack and chip, thereby causing spots of rust to appear.

JOSEPH H. BARFORD.

**The Architectural Association.**—The seventh meeting of this Association for the present session was held on the 15th inst., at the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair. The following gentlemen were elected members of the Association, *viz.*: Messrs. F. Galsworthy and H. D. A. Harding. Mr. Owen Fleming moved the following resolution, of which he had given due notice:—

"That the Architectural Association views with regret the agitation for the demolition of the church of St. Mary-le-Strand, and desires to enter its earnest and emphatic protest against any such demolition, as being not only utterly uncalculated for the requirements of traffic, but also a wanton destruction of one of the finest examples of the work of that eminent architect, James Gibbs, training, with the buildings around it, one of the most beautiful and picturesque architectural groups in London."

Mr. C. H. Brodie seconded the motion, which was passed unanimously, and copies were ordered to be sent to the London County Council, the Strand District Board of Works, and the Rector of the Church of St. Mary-le-Strand. Mr. A. B. Pite then read a paper on "The Design and Manufacture of Wall-Papers." He is compelled, owing to the amount of space taken up by Mr. Blackall's paper on "Doors," and its accompanying illustrations, to hold over Mr. Pite's paper, and the report of the discussion which followed it, until next week, when we will give them, with a few of the aspirations.

**Death of Mr. S. C. Hall.**—We regret to have to announce the death of Mr. Samuel Carter Hall, F.R.S., which took place on Saturday last. He had nearly reached the completion of his eighty-eighth year. He was for many years editor of the *Art Journal*, and was a contributor to the *Builder* many years ago.

#### CHURCH-BUILDING NEWS.

**Heanton Punchardon.**—On Shrove Tuesday the Parish church of Heanton Punchardon, near Barnstaple, was reopened, with a sermon by the Bishop of Exeter, after partial renovation. It is an ordinary Devon church with chancel of fourteenth century date, of which only the proportion and none of the details remain; a nave with south porch, and north aisle extending one bay on to the chancel; a north-east vestry; and a fine western tower, well built, but with pinnacles inclining outwards, whether purposely or not, over the angles of the tower. Debt has been scrupulously avoided, and nothing therefore has been done to the roofs, which are in a bad state of decay, but the western tower has been put into a state of repair, and its six good bells have been re-hung at the expense of Sir William Williams. Some of the old windows had been made up, principally with cement; others were of wood, painted and sanded to imitate stone. These have been renewed in Ham Hill stone. The old paving-stones and monumental slabs have been relaid in their old positions, the intermediate spaces being made up with tiles; and wood-paving blocks have been laid under the open benches. These are of pitch-pine, commodious and comfortable, with cut and deeply-moulded elbows. The chancel had been shortened and cramped by the removal of the old carved oak screen one bay eastwards. This has now been replaced in its old position, on the original step, and is being continued across the aisle. Oak stalls, with cut and moulded ends, have been provided for the chancel. The work in the chancel has been done at the cost of the present rector, the Rev. Charles E. Lamb. The work has been carried out by local tradesmen, without a builder, under the direction of Mr. William White, F.S.A., architect.

**Horwood (Devon).**—At the parish church of Horwood, Devon, now being restored by Mr. W. Dart, of Crediton, the workmen have discovered two interesting piscines,—one in the south chancel wall, the other in the north chancel aisle. The former is most unique, and probably dates from the thirteenth century. Other beautiful remains of stone and woodwork have been brought to light. The architects for the restoration are Messrs. Hayward & Tait, of Exeter.

**Leamington.**—A tower and spire have been erected for the Church of St. John the Baptist, at Leamington. The spire rises to the height of 175 ft., and is built mainly of brick. It is a broached spire, with pinnacles and lucarnes, and surmounts a tower, with belfry, stage, and buttresses. It is in the Transition style, from the thirteenth to fourteenth centuries, and, together with the church, was designed by Mr. J. Candall, A.R.B.A., and was carried out by Mr. G. F. Smith, builder, Leamington.

**Mytholmroyd.**—The Church of St. Michael, Mytholmroyd, which has been enlarged and restored, was recently re-dedicated by the Bishop of Westfield. Messrs. T. H. & F. Healey, architects, of Bradford, prepared the plans for and superintended the alterations. The church had a north aisle and chapel, and it was decided to add a south aisle and chapel, and thus give to the building its proper proportions. It was also decided that the chancel should be pulled down, and rebuilt on a larger scale, so that a clergy and choir vestry, as well as an organ-chamber, might be added to it. In addition to these alterations, it was resolved that the church should be re-pewed and re-lighted throughout, and a new heating apparatus provided. The contracts were let to the following firms:—Mason, Mr. B. Lumb, Todmorden; joiners, Messrs. Halstead Brothers, Eastwood; plumber, Mr. J. Greenwood, Mytholmroyd. The total cost of the works now carried out will be upwards of 2,000l.

**Rishton (near Blackburn).**—The Church of SS. Peter and Paul, Rishton, has been reopened, after being closed for a period of nine weeks, during which it has undergone a thorough decoration. The work has been carried out from drawings prepared by Messrs. Simpson & Duckworth, architects, Blackburn, by Helyar & Son, decorators, Manchester, under the direction of the Church Committee. The general scheme of colouring is in light and warm tones, in harmony with the prevailing tints of the stonework. The nave and aisles are painted in light terra-cotta, with cream bands and stencilled ornaments, the transepts being more elaborately decorated. On the east wall are painted full-size figures of the patron saints on

gold ground panels; the wall under on each side of the reredos is hung with rich tapestry. The cost of the decorations has been about 250l. A new organ has been erected by the firm of Forster & Andrews, Hull, at a cost of over 600l.

#### STAINED GLASS.

**Bath Abbey.**—The *Bath Chronicle* reports that, by the munificence of Miss Little, daughter of the late Mr. Bartlett Little, the entire northern half of the west window at the Abbey has been filled with stained glass by Messrs. Clayton & Bell, of London, in accordance with their design. Nine lights are now occupied by the following subjects:—Joseph sold by his brethren, Joseph interpreting Pharaoh's dream, Jacob blessing his children, Moses delivering the Law, the building of the Tabernacle, falling of manna, Balaam and his ass, Moses and Joshua before the Ark, Deut. xxxi. 14, and Moses delivering the Law to the priest, Deut. xxxi. 26. Above, the tracery has been treated so as to correspond with the lights below. The total cost has been about 400l.

**Llangoreen.**—The two large west windows of this parish church have been filled with stained glass, from the studio of Messrs. Chas. Evans & Co., of Warwick-street, Regent-street, as a memorial to Miss Katie Francis, of Wallog. The windows are exceptionally rich in detail, and amongst other subjects are illustrated the parable of the "Good Samaritan," the "Marys at the Tomb," "Visiting the Sick," and "Christ rebuking Martha." The windows are thirteenth-century in character.

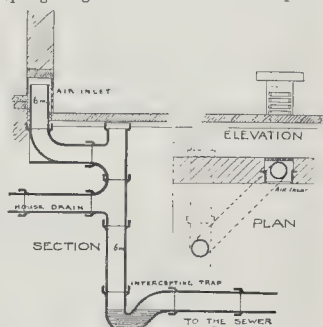
**Wellesbury.**—Another two-light painted window has recently been erected in this parish church, in memory of the late Mrs. Knowles. The texts illustrated are, "He is not here, but is risen," and "Mary hath chosen that good part." The artists were Messrs. Charles Evans & Co., who erected the Tuthill Memorial in this church.

#### The Student's Column.

##### TOWN DRAINAGE.

##### XII.—VERTICAL AIR INLETS TO A HOUSE-DRAIN.

**AIR INLET TO THE DRAIN OF THE DETACHED HOUSE IN THE SKETCH-PLAN OF THE LAST ARTICLE MAY BE THE SAME AS THAT SHOWN IN THE DETAILED DRAWING OF ARTICLE VIII. (SEE P. 151 *ante*), AS IT WOULD NOT BE IN A ROADWAY; BUT FOR SMALL HOUSES IN A ROW, SIMILAR TO THOSE SHOWN IN THE OTHER SKETCH-PLANS, IT WOULD BE INAPPROPRIATE, INASMUCH AS IT WOULD BE IN THE FOOTWAY OF THE STREET. THIS MAKES IT NECESSARY TO INTRODUCE THE AIR THROUGH A VERTICAL OPENING. THE VERTICAL FORM OF OPENING IS APPROPRIATE FOR ANY HOUSE, LARGE OR SMALL; BUT IN LARGE HOUSES, WITH OPEN GROUND IN FRONT, A HORIZONTAL INLET MAY BE ADOPTED. THE HORIZONTAL INLET ADMITS THE AIR WITH LESS OBSTRUCTION, AND IS, THEREFORE, PREFERABLE; BUT FOR SMALL HOUSES, SUCH AS THOSE SHOWN IN THE LAST ARTICLE, AND FOR SMALL HOUSES GENERALLY, THE VERTICAL OPENING IS THE ONLY ONE WHICH IS PRACTICABLE. WE HAVE SAID BEFORE THAT IN A ROADWAY OR FOOTWAY AN OPEN GRATING SHOULD HAVE A DIRT-BOX SUSPENDED**



under it, but that with a pipe inlet this cannot be adopted, because it fills up too much of the airway. The vertical grating is, therefore, preferable in this case, and should be built into the wall, so that it cannot be removed, mischievously or otherwise. Its bars are hori-



rontal, 1 in. square, with spaces of 1½ in. The bars do not extend to the top of the casting, which is 12 in. high, but only to the height of 8 in., there being a dead-plate 4 in. deep at the top. The bottom of this plate, which forms part of the casting, is 2 in. below the top of the air-inlet pipe, and there is a space of 2 in. between the top of the pipe and the underside of the stone lintel, which covers the opening in the wall. It is 9 in. wide, or of the thickness of the wall, whatever that be, and of the depth of a course of bricks. A brick in length of the wall is left out, to form an opening for the 6-in. pipe. Under the footway, immediately in front of the house-wall, a 6-in. pipe is brought up vertically from the drain-trap, to within a few inches of the surface, and covered by the street flagstones or other pavement. There is a branch on this vertical pipe, turned in the direction of the air inlet, and from this branch 6-in. pipes, with proper bends, are set and jointed, terminating at a level 2 in. below the underside of the stone lintel in the wall which covers it and the vertical grating. Pipes are made in various short lengths to suit this and other purposes; but in the absence of these, the pipes can be cut to the exact length required in every case. The dead-plate at the top of the grating, and in front of the top of the air-inlet pipe, is for the purpose of preventing the top of the pipe being reached. Such little things as these, with others, have to be considered in laying house-drains in some situations. The bars of the grating are horizontal, for the reason that it is more difficult to reach the top of the pipe through them than through vertical bars. The area of all the openings is 35 square inches,—only one-fourth more than that of the pipe; it would be better 50, if it were practicable. The position of the air-inlet so near the doorway and the window in front of the house would be objectionable if, instead of the air passing inwards, it should pass outwards through the grating; but the provision of a ventilating outlet-pipe at the head of the drain, carried up to a level much above the inlet, has the effect of inducing the passage of air inwards through the air grating; and it is, at any rate, the only position within the rights of the owner of the house.

If the footway in front of these houses has a deep curbstone, and if the street authority give permission to the owner of the house to place the air-inlet to his drain in its vertical face, by substituting for a part of it an iron casting containing the requisite grating and continuation of the surface of the curbstone in one, this position may be adopted instead of the one above described. It is a very old method of admitting the water of the street channel to the pipe which conveys it to the sewer, to provide such a vertical opening in the line of the face of the curbstone, where it is deep enough, to take the excess of rain-water which cannot pass through the ordinary horizontal gully grating of the street channel, and the same form of opening, with a grating, may be adopted for the air-inlet to a house-drain, which may be directly over the drain or not, at convenience; but it is not within the power of an owner of a house to place it there; and if so placed, it cannot be so well protected as in the other position; and, seeing that the air-inlet is above the intercepting-trap, and that, therefore, though by chance air might flow outwards instead of inwards through this opening, it cannot be the air of the sewer, the position first described is preferable to the second one. But one or the other is a necessity. The vertical pipe-shaft carried up from the drain under the footway has its top closed. Its purpose is to permit access to the intercepting trap by means of a rake in case of stoppage there of the flow of sewage through the drain. It need not be anticipated that a stoppage will often occur, or even at all, when the drain has been laid in a regular manner with water-tight joints; but it is nevertheless proper to provide such a means of access. Seeing, however, that before the trap could be completely stopped, a head of water must accumulate to the height of the difference of level between the two portions of the drain, below and above the intercepting trap and air inlet, it is almost impossible that this pressure of water should not force through the trap everything which can come into it. In the figure this difference of level is 3 ft. It may often be less than this, but may in nearly all cases be made sufficient even though considerably less than that here shown.

### Books.

*Ein Rundgang durch die Ruinen Athens.* Von Dr. FRITZ BAUMGARTEN. Mit 10 Abbildungen. Leipzig: Hierzel, 1888.

WE are glad to welcome the second edition of a very useful little book which, in its first issue, escaped our notice. Dr. Baumgarten has put together, in the very limited space of eight pages, just the amount of information about the topography and monuments of Athens that the intelligent traveller who is not a specialist, or the ordinary educated reader at home, wants to have at hand. As a schoolmaster, he has specially had in view the wants of boys who are reading classical authors, but his book is sure of a much wider public. It is based, as every work of the kind, however elementary, must be, largely on the narration of Pausanias. References to modern authorities for particular views are advisedly not given. In a book of this kind they are out of place, but, as foot-notes, references to the principal classical passages are added. The few wretched illustrations might as well have been omitted; but there are four valuable plans, showing the latest discoveries. In the plan of the Dionysiac Theatre it is a pleasant surprise to find the old orchestra recently discovered by Dr. Dörpfeld clearly marked. It is somewhat strange that a discovery so important should first appear in a plan made for a book so obviously popular. On the same plan (which includes the Acropolis) the Chalkotheke is marked (though with a query) in its wrong place, and the precinct next to that of Artemis Brauronia, bears the name, now known not to be authentic, of Athenæ Ergane. But these are trifling matters, to be altered in another edition; the wonder only is that, as Dr. Baumgarten has not himself been to Athens, the book is so well posted up to date. We can only hope that shortly some master of an English public school will prepare a similar book for the use of his pupils.

*Rates and Charges on Railways and Canals.* By PERCY GYE and THOS. WAGHORN. London: Waterlow & Sons. Price, 2s.

IN congratulating ourselves upon the setting at rest of various troublesome railway questions by means of the Railway and Canal Traffic Act of 1888, it would appear that we have been rather too premature. According to the writers of the treatise under notice, the Act just completed with so much care, and after so much deliberation and discussion, is as vague and indefinite in some of its most important provisions as are its predecessors. For instance, we read, "There are clauses directly dealing with the subject of undue preference, but, in common with the remainder of the Act, they ring with a very uncertain sound." The fact is, the legal mind can discern so many meanings to a word or a phrase, that we need not feel much surprise that our authors, contemplating from the Inner Temple the future working of this Act, should "scent the battle from afar." We are also warned in passing, not to place too much reliance upon the Act as a means of cheapening procedure. "Until Parliament by its fiat can order that which is abstruse to become simple, and can compel the services of the leaders of the Bar gratuitously for the benefit of oppressed traders, the inexpensiveness of the Railway Commission must perform remain in its state of recommendation as at present."

Assuming this view of the "uncertain ring" of the Act to be correct, one's feelings of disappointment are naturally succeeded by stirrings of indignation against the draftsmen entrusted with the preparation of the clauses. But our authors promptly interpose to shield those officials, attributing the defects of the measure to the want of machinery for passing any comprehensive and consistent scheme through Parliamentary Committees. We are also told that "however perfectly a Bill may be drawn for presentation to Parliament, a few injudicious amendments in Committee will relegate the whole matter to its original obscurity." Why, we were always under the impression that in the removal of ambiguity and the dispelling of doubt and uncertainty was one of the chief aims of Committees. During the passage of a measure through its various stages, objections are frequently disposed of by the assurance that all little doubts and inconsistencies will be rectified "in Committee." Now we are told that this is all a delusion and a snare!

This treatise is a less pretentious work than

some which have appeared on the same topic, but there is much information in its pages which will prove of service to those interested in the subject.

*Practical Plane and Solid Geometry, Scales, and Pattern Drawing.* Revised and enlarged edition. By JOHN S. RAWLEY, F.S.A. London: Simpkin, Marshall, & Co.

THIS small book contains a great deal of information crowded into a small compass, the problems being described in the briefest possible language, and with illustrations just large enough to give their meaning without taking up any unnecessary space on the page. A direct practical application of geometry to architectural drawing is made in regard to the manner of drawing various foiled figures within assigned spaces, and in regard to geometrical pattern-drawing on a more elaborate scale. A great many notes are appended to the problems, suggesting further applications of them, or considerations arising out of them. The book is very small and compact, and crammed with information.

*Elementary Building Construction and Drawing.* By E. J. BURELL. London: Longmans, 1889.

ALTHOUGH the author of this work modestly states in his preface that it is primarily intended for the use of those preparing for the examinations of the Science and Art Department, we are disposed to think that it will have a wider circle of readers. Admirable as are the three volumes of "Building Construction" published by Messrs. Rivington, their price is such that many an architectural student prefers to consult them in libraries rather than to purchase them, but when he finds that he can obtain for half-a-crown an excellent practical text-book of building construction, full of illustrations of working details, clearly engraved and accurately dimensioned, he will have no excuse for not possessing a copy. Only the elementary operations of the builder are dealt with, but these are very clearly explained. In the bricklayers' trade the different kinds of bond, arches, footings, &c., are described and illustrated. Details of the various kinds of stone walls are given, and the proper way of bedding stones in staircases, cornices, &c., is pointed out. We are surprised, however, after the publicity which has been given to the numerous experiments that have been made in this and other countries on the effect of bedding lead between the joints of stones, that its adoption should still be recommended. It is now clearly proved that the use of lead for this purpose is greatly to be condemned. We also think that the remarks on the stone copings of steep gables are not so clear as they might be. The passage now reads as if the author were of opinion that the use of kneelers is only alternative to that of dowels, whereas we hold very strongly that in such positions the coping stones should never depend upon dowels alone, and that kneelers are indispensable. The chapters on carpentry and joinery appear excellent, as well as those on plumbing and slating.

The chapter on iron beams rightly insists upon the urgent necessity of covering such beams with some non-conducting material if safety from fire is to be insured; but the remarks on the behaviour of beams under loads in different positions are too scanty to be of much use. We notice also one very decided error; it is stated that if a beam supported at the ends will sustain a load of four tons concentrated at the centre, the same beam firmly fixed at the two ends will carry a concentrated load of eight tons. This is quite wrong, as it would only carry six tons. The simpler forms of iron roof are clearly described, and the book closes with some concise remarks on the materials used in construction. The publishers are to be highly commended for the excellence of the working details which are given, and their value is enormously increased by the figured dimensions which are attached to them. We should add that a number of exercises bearing upon the subject matter are given at the end of each chapter.

*Practical Elements of Construction.* By PERCY L. ADDISON, F.G.S. London: Elliot Stock, 1888.

WHEN an author frankly states in his preface that he has submitted the MS. to two competent judges, both of whom condemn it as unfit for publication, a reviewer hardly knows



which to admire more, the candour of the avowal or the faith of the author in his own opinion. The work professes to be a reference book for engineers and builders, and comprises notes on railway surveying, wing walls, girders, foundations, &c. The author has evidently a wide practical acquaintance with the subjects of which he treats, but more than this is required for the preparation of a book of reference on technical and scientific subjects. We should be sorry to say that no one would find the work useful, but we think the number of readers who would do so is very limited, and, on the whole, we are disposed to agree with the opinion of the experts referred to in the preface.

**Museums and Art Galleries.** By THOS. GREENWOOD, F.R.G.S. (London: Simpkin Marshall & Co. 1888.)

THE object of the writer of the above work is to urge upon the nation at large the necessity of providing in each of the great labour centres museums and free libraries; upon Government officials abroad the duty of contributing to the collections at home; and upon curators and librarians the desirability of an exchange of objects of special interest, and the distribution of duplicate specimens.

The whole system should, the author thinks, be placed under a Minister of Instruction, and he separates trusts for the British Museum, the South Kensington Museum, &c., be subject to a single administration.

The author is strongly impressed with the moral uses of such institutions as he advocates, and traces in the diminishing statistics of crime of all kinds their immediate influence.

The body of the work consists of descriptions in detail of the foundation, scope, and peculiarities of many of the most important museums and art galleries in the kingdom,—in some cases illustrated by very poor woodcuts of the external aspect of the building, and less frequently by useful plans. The really magnificent art gallery at Birmingham is awarded the palm as "the finest art gallery out of London," Leeds, Manchester, and Liverpool possessing almost equal claims upon our regard.

The author is severe upon the Scottish apathy where Art is in question, and he is especially severe upon Glasgow. It is strange he should have made no mention of the Museum and Art Gallery at Stirling, the gift of a citizen, and excellent in every way.

An appendix contains the various Acts of Parliament in connexion with the subject, a form of bequest as a guide to the philanthropist, and a collection of the opinions of eminent men in the advantages of the institutions advocated.

Mr. Froude says that free libraries which contain the *right books* are of immense value; at that present the most absurd books are he most in request; while Mr. Gladstone is credited with the following oracular dictum:—  
"A Free Library is of great importance for maintaining the knowledge and guiding the life of those who can use it, even though they may not represent the entire population!"

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

3,634, Door-fastenings. W. Fraser.

In order to make the closing and locking of a door easy, a small wheel with wings is, according to his invention, secured to the striking-plate. This is similar to a turnstile, being only permitted to revolve in a forward direction. The bolt of the lock does not require to be pushed in or back; the moment it comes in contact with the turnstile, or rather with one of the wings of it, the bolt causes the wheel to turn partly round. It will continue to turn until the door is hard up against the stop, when the wheel drops into notches on the upper edge of the bottom plate or bracket. The door can only be opened when the bolt is drawn entirely back.

5,601, Gas Soldering-irons. F. McCulloch.

According to this invention, a rubber tube and a Bunsen burner are used. Into one end of the tube is screwed a tubular head or bit-holder, having formed on its upper side two arms or jaws for holding the bit, which is preferably adjusted by means of a pin or screw. The tubular head is so set downwards as to allow the flame issuing therefrom to play upon the point of the bit and keep it heated. This bit is provided with a hole for the passage of the screw or pin holding it to the jaws, and, by taking it out or unscrewing the

pin, the bit may be removed and a different bit inserted. A small pilot or touch-light is provided, so that the iron can be used at a moment's notice. A rest, or support, is designed to receive the soldering-irons when not in use, and this rest is preferably made hollow to receive the bit.

5,728, Water-waste Preventers. O. Elphick.

All valves are dispensed with in the invention which is the subject of this patent. Around the outlet-pipe is a cylinder closed at its lower end where it is fixed to the bottom of the tank, and projecting upwards to just above the top of the tank. Inside this cylinder is a cone or funnel, fitting it at the top and descending into it some way below the top of the outlet-pipe so as to form a trap. Fitting loosely on the outside of the cylinder is a second cylinder or bell closed at the top and connected to the lower handle or other actuating mechanism. Sufficient space is left between the bottom of this bell and the fixed cylinder to allow the water to flow freely between them. When the bell is depressed by the handle, the air in the top is compressed, and passes down the funnel up through the water at the bottom of the fixed cylinder and out through the outlet-pipe. When the bell is again raised, a vacuum is formed, drawing in water from the tank, which, rising above the top of the funnel, flows down it and produces a syphon action by which the tank is emptied down to the level of the bottom of the bell, sufficient water remaining in the bottom of the fixed cylinder to form a trap to the bottom of the funnel.

10,515, Window-glass Setting. J. V. Auth.

The object of this invention is to provide a simple and cheap method of permitting the expansion and contraction of glass or lights used in windows, and security in setting and handling the glass. An india-rubber cushion of U form is drawn over the edges of the glass, and it is claimed that should the plate of glass thus set up or placed in a window-frame expand when subjected to a very high temperature, the rubber will yield, and thereby prevent serious damage to the glass or should the building settle or the frame warp, the glass will be protected from breakage.

14,674, Appliances for payment of wages. D. W. Bundy.

According to this invention, small flat money boxes are provided on which is marked the name or number of the *employee*. These fit into trays, which again fit into nests or cabinets, and arrangements are provided by which the whole apparatus is locked and rendered safe for transit.

12,862, Sash-fasteners. T. Parkes.

According to this invention, a bolt is constructed, cylindrical wedge shape, which moves in a case or frame having a slot in the upper surface. The case or frame is cast in two half-circles; the one secured to the bolt is slotted, and the other has an aperture to receive the bolt when moved forward in locking the two sashes together. Each half of the case is cast in metal separately, and the separate parts are afterwards riveted or screwed together as required.

### NEW APPLICATIONS FOR PATENTS.

March 4.—3,758, W. Dowland, Plane-iron for Carpenters, &c.—3,763, W. Mitchell and W. Hare, Chimney-cowl.

March 5.—3,833, T. Kemp, Testing House Drains.—3,851, H. Hellewell, Chimney-top, &c.—3,872, L. Cadwell, Pavements, &c.—3,876, B. Finch, Smokeless Stove.

March 6.—3,899, W. Johnson, Pressing Sand-faced Bricks.—3,925, R. Capstick and H. Pinchock, Self-locking Sash-fastener.—3,970, E. Matheson, Tiles, and Fixing same.

March 7.—4,005, J. Hall, Norfolk Latches.—4,009, W. Henderson, Window-sash Furniture.

March 8.—4,065, W. Davidson, Fastenings for Rain-water Pipes, Soil-pipes, &c.—4,076, J. Taylor, Self-closing Doors.—4,079, J. Brundrett, White-wash Brushes, &c.—4,087, F. Lane, Horizontal Saw Frames.

March 9.—4,147, F. Harbidge and E. Nowell, Combination Carpenter's Square, &c.—4,161, A. Hince, Sash-fasteners.—4,174, F. Vine, Burglar-proof Fastenings for Windows.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

624, C. Thode, Automatic Door Hinge and Check.—1,623, W. and C. Chandler, Flushing Cistern.—1,888, J. Cole, Ventilating Hook for Sashes.—2,321, P. Ahorne, Window-fastener.—2,347, J. Gunter and J. Langer, Girders and Channels.—2,651, G. Newman, Spring Hinges, &c.—2,692, W. Poole and A. McLeod, Trench Drainage Pipes, &c.—2,741, G. Newman, Door Springs and Checks.—2,862, H. Lake, Water-closets.—2,993, J. Mathieson and others, Stoves and Cooking Ranges.—3,076, W. Cowan, Syphon-flushing Cisterns.

### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,207, G. Arnold, Joint Connexions of Sanitary Drain-pipes, &c.—6,651, T. Twyford, Flushing

Cisterns.—6,712, J. and B. Craven, Machines for Pressing Bricks, &c.—6,960, W. Scott-Moncrieff, Grass Interceptors for House Drains, &c.—14,173, W. Dawson, Window-sashes.—1,874, D. Hoey, Revolving Cows, &c.—2,239, W. Blakely, Protecting Timber from Decay.

## RECENT SALES OF PROPERTY.

### ESTATE EXCHANGE REPORT.

[Contractions used in this list.—"g." for "ground"; "rent" for "years"; "a." for "acre"; "st." for "street"; "rd." for "road"; "sq." for "square"; "pl." for "place"; "ter." for "terrace"; "yd." for "yard," &c.]

MARCH 11.—By J. C. PLATT.

Hammersmith—164, Bridge-rd., 42 yrs., g.r. £275  
42 yrs. 6d. 305  
28, Bridge-rd., 50 yrs., g.r. £5. 12s. 6d. 315  
85, Bridge-rd., 45 yrs., g.r. £4 60s

MARCH 12.—By DERENHAM, TAYLOR, & CO.

Chester, Crouch-la.—A cottage and 6a. 2r. 29p. 360  
Camden-rd.—Improved g.r. of £13, term 53 yrs. 245  
City-rd.—Improved g.r. of £12, term 35 yrs. 230  
Homerton—Improved g.r. of £147. 14s. term 5 yrs. 600  
Horton—Improved ground-rent of £10, term 17 yrs. 610  
Holloway—18 and 20, Lowman-rd., 75 yrs., g.r. £12. 12s. 610  
61 to 75 odd, Grayford-rd., 77 yrs., g.r. £36 1,915

By GIDNY & TURNER.

Limehouse—63, 65, and 67, Salmon's-ls., copyhold 1,000

By W. HOLCOMBE.

Marylebone—72 & 74, Richmond-st., 33 yrs., g.r. £16 390  
50 and 58, Richmond-st., 33 yrs., g.r. £14. 3s. 420

By BARR, BURNETT, & CO.

Marylebone—21, Saville-st., 30 yrs., g.r. £13 1,070  
Sydenham—Ground-rent of £56 a year, reversion in 88 yrs. 1,250  
Wandsworth—Ground-rent of £13. 10s., reversion in 87 yrs. 310  
Ground-rent of £39. 10s., reversion in 87 yrs. 2,210  
Walham Green—Ground-rent of £38, reversion in 87 yrs. 785  
Finbury Park—Ground-rent of £26. 4s., reversion in 92 yrs. 650  
Hornsey—Ground-rent of £25. 10s., reversion in 88 yrs. 510

MARCH 13.—By H. DONALDSON.

Hackney-rd.—No. 365, term 27 yrs., g.r. £5. 6s. 6d. 390  
Stoke Newington—1, Gordon-rd., 71 yrs., g.r. £6. 6s. 600

By L. J. FRASER.

Romford—The "LAUREL ARMS" tavern, freehold 935  
Bethnal-green—31 to 37 odd, Coventry-st., freehold 1,150  
39 to 45 odd, Coventry-st., freehold 865  
5, 7, and 9, Northampton-street, freehold 890  
32, Coventry-st., freehold with possession at Christmas, 1893 1,360

By INMAN SHARP, HARRINGTON, & ROBERTS.

Portland Estate—5, Weymouth-st. and stabling, 99 yrs., g.r. £60 1,320  
36, Wimpole-st., 32 yrs., g.r. £80 3,300  
13, Margaret-st., 42 yrs., g.r. £28 1,460  
59, Margaret-st., and 1, Margaret-court, 33 yrs., g.r. £15 1,290  
62, Margaret-st., 35 yrs., g.r. £60 1,620  
8, Margaret-court, 33 yrs., g.r. £28 710  
6, Margaret-court, 40 yrs., g.r. £6 680  
190, Oxford-st., and 28, Market-pl., 64 yrs., g.r. £100 6,000

Newington Causeway—Nos. 73 and 75, term 25 and 34 yrs., g.r. £55 and £36; also the freehold reversion to two-fifths shares of No. 75. 1,550  
Clerkenwell—129 and 131, King's Cross-rd., 62 yrs., g.r. £15 940  
Fitzroy-square—8 and 9, Charlton-st., 23 yrs., g.r. £80 890  
Marylebone—39, Upper Marylebone-st., 9 yrs., g.r. £30 250

MARCH 14.—By DALE & SON.

Mill End—1, Grafton-st., 67 yrs., g.r. £4. 10s. 385  
Mill End-rd.—No. 400a, the lease of, term 10 yrs. 130

By E. J. GAIRDNER.

Holloway, Burnard-ter.—Ground rent of £3. 15s., reversion in 57 yrs. 105  
Ground-rent of £19, reversion in 97 yrs. 638  
Ground-rent of £7. 10s., reversion in 58 yrs. 265  
Wandsworth-rd.—"Crown and Anchor" beer-house, freehold; and an annual rent of £1, term 40 yrs. 1,220

By C. C. & T. MOORE.

Mill End—45, Lindley-st., 113 yrs., g.r. £2. 5s. 60

By H. J. BLISS & SONS.

Victoria Park—4, 5, and 7, Shafton-rd., 67 yrs., g.r. £12. 12s. 585  
26, Groombridge-rd., 64 yrs., g.r. £8 325

By E. SIMMONS.

Camberwell, Smith-st.—Crown Cottage, freehold 600  
83, Camberwell New-rd., 13 yrs., g.r. £1 255  
Battersea—2, 4, 10, and 12, Octavia-st., 59 yrs., g.r. £24 1,110  
Walworth—46, Townley-st., freehold 230  
Peckham—1 and 2, Home-grove, freehold 340  
Clapham—12, Shelgate-rd., 79 yrs., g.r. £8 270  
Blackfriars—14 to 20, Valentine-pl., 44 yrs., g.r. £126 46

By DOWSETT & CO.

Old Kent-rd.—Nos. 572, 574, and 576, term 17 yrs., g.r. £13 990  
Peckham—32 and 34, Frankton-rd., 70 yrs., g.r. £10 376  
Caterham—"The Garlands," and 1a. 1r. 6p. freehold 1,960

By NEWSON & HINDRICK.

Clapham—St. Stephen's-ter., "Royal Albert" tavern, 74 yrs., g.r. £7 1,400  
19, 30, 47, and 49, Aldebert-ter., 74 yrs., g.r. £30 1,280  
Caledonian-rd.—23, Twyford-st., 52 yrs., g.r. £6 1,240  
Hillingdon—33, Packington-st., 47 yrs., g.r. £7 525  
Holloway—2, Upper Tollington-rd., 53 yrs., g.r. £8. 10s. 345  
Stoke Newington—5, Harcombe-rd., 75 yrs., g.r. £5 235



MARCH 15.—By Messrs. ELWOOD.

|                                                               |       |
|---------------------------------------------------------------|-------|
| St. John's Wood, Aconia-road—Ground-rent of £18, term 48 yrs. | 4,235 |
| Ground-rent of £24 15s., term 48 yrs.                         | 1,620 |
| By GEO. GOLDSMITH, SON, & CO.                                 |       |
| Eaton-square—No. 45, term 28 years, g.r. £200                 | 4,400 |
| By J. J. DEVERELL.                                            |       |
| Kentish-town—32, Dale-road, 75 yrs., g.r. £8.                 | 430   |
| Tufnell Park—73, Hindland-Clarks, 78 yrs., g.r. £27 7s.       | 390   |
| Beckenham, Kent House-rd.—Freehold residence, "Montrose"      | 650   |

## MEETINGS.

## SATURDAY, MARCH 23.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." V. 3 p.m.  
 Edinburgh Architectural Association.—(Visit to Midcalder Church and Calder House.)

## MONDAY, MARCH 25.

Royal Institute of British Architects.—Mr. J. J. Stevenson, F.S.A., on "The Planning of Streets for Convenience and Architectural Effect." 8 p.m.  
 Society of Arts (Cantor Lectures).—Mr. C. V. Boys, F.R.S., on "Instruments for the Measurement of Radiant Heat." I. 8 p.m.

## TUESDAY, MARCH 26.

Institution of Civil Engineers.—Mr. C. E. Emery on "The District Distribution of Steam in the United States." 8 p.m.  
 Society of Arts (Foreign and Colonial Section).—Mr. R. Pritchett on "Borneo." 8 p.m.  
 Sanitary Institute (Lectures for Sanitary Inspectors).—Professor W. H. Corfield, M.A., on "Sanitary Appliances." 8 p.m.  
 Birmingham Architectural Association.—Mr. W. H. Kendrick and Mr. H. H. McConnell on "Old Woodwork."

## WEDNESDAY, MARCH 27.

Inventors' Institute.—Mr. T. Glover Lyon, M.A., M.D., on "On the Distinction of Clothing, &c., by Steam and other Methods." 8 p.m.  
 Society of Arts. Adjourned Discussion on Professor Kennedy's paper on "The Objects and Methods of the Society of Arts' Motor Trials." 8 p.m.  
 Builders' Foremen and Clerks' Works' Institution.—Quarterly Meeting of the Directors. 8.30 p.m.

## THURSDAY, MARCH 28.

Royal Institution.—Professor J. H. Middleton, M.A., on "Houses and their Decoration, from the Classical to the Medieval Period." II. 3 p.m.  
 Sanitary Institute.—Professor W. H. Corfield, M.A., on "House Sanitation from a Householder's Point of View." 5 p.m.  
 Society of Antiquaries.—8.30 p.m.  
 Society for the Encouragement of the Fine Arts.—Professor J. F. Hodgkins on "The Arts in the Pre-Christian times amongst our forefathers in Scandinavia and in England." 8 p.m.

## FRIDAY, MARCH 29.

Society of Arts (Indian Section).—Sir Juland Danvers on "The Progress of the Railways and Trade of India." 8 p.m.  
 Sanitary Institute (Lecture for Sanitary Inspectors).—Mr. C. E. Cassal on "Food (including Milk), Sale of Food and Drugs Act." 8 p.m.

## SATURDAY, MARCH 30.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." VI. 3 p.m.

## Miscellaneous.

**A New Club at Watford.**—The new Watford Conservative and Constitutional Club was formally opened on Tuesday by the Marquis of Salisbury. The building occupies a prominent position at the corner of High-street and Clarendon-road. It is executed in red brickwork, with Monk's Park stone dressings, except in the gables, where buff-coloured terra cotta has been introduced. The edifice contains a hall 48 ft. by 28 ft. 6 in., reading and refreshment-rooms, two large billiard rooms, bar, card, chess, committee, and retiring rooms, with apartments for steward. Mr. T. Turner, of Watford, has carried out the works, from the designs of Mr. W. H. Syme, A.R.I.B.A.

**Street Paving.**—The use of indiarubber for street-paving has been brought forward by a German engineer, Herr Busse, of Linden, in Hanover. The material was first tried on the Goethe Bridge, 1,000 metres in area, and, it appears, with the greatest success. In Berlin experiments with the new paving material are now being made in the Lützow-road, and other experiments are to be made in Hamburg. The new method is said to be particularly suited for bridges, inasmuch as it reduces the oscillation, but it is stated that the cost of such paving is somewhat higher than with other material.

**New Board-school.**—Plans for a new Board-school for the Clew-with-Weelsby School Board, to accommodate 1,000 children, have been approved by the Education Department, and will be proceeded with at once. Mr. E. W. Farebrother, of Grimsby, is the architect.

**Registration of Plumbers in Leicestershire.**—The Mayor of Leicester presided on the 14th inst., at a large and representative public meeting held in the Wyggeston School, Leicester, for the purpose of electing a District Council to carry out in Leicestershire the National System of Registration and Training of Plumbers inaugurated by the Worshipful Company of Plumbers, London. Mr. Philip Wilkinson, architect (Past Master), and the Clerk (Mr. W. R. E. Coles), attended as a deputation from the Company. Among those who took an active part in the proceedings were several members of the Corporation of Leicester and of the medical and architectural professions. The Mayor, in opening the proceedings, said that the guild of Plumbers of London had done, and were doing, a good work in organising their system throughout the kingdom, and he thought it was an honour to Leicester to be selected as a centre. Mr. Philip Wilkinson explained that all plumbers who entered the trade since March, 1886, would have to undergo examination prior to being admitted to the Company's register. But those who were engaged in the trade previous to that date would be admitted upon production of their indentures of apprenticeship, or other satisfactory evidence of their competence. Messrs. Joseph Goddard and J. Tait, speaking for themselves and their brother architects, said they welcomed the system because it was of the utmost importance that architects should have conclusive proof of the efficiency of the plumbers whom they employ to carry out their work. Mr. Harrison, the President, and Mr. G. B. Cherry, the General Secretary of the United Operative Plumbers' Association of Great Britain and Ireland, were present, and the latter said that technical education of a practical kind was warmly welcomed by plumbers. He was convinced there was no lack of practical plumbers in each district. The men who brought discredit upon the trade were not plumbers at all. Examination and registration would enable the public to distinguish who were plumbers. Dr. Thompkins, Medical Officer of Health, said he saw no reason why the duty of supervising plumbing-work should not ultimately devolve upon the local Health Authorities, who already supervised the erection of houses and the laying down of drains. A resolution was unanimously passed approving the Company's system, and representatives of the master and operative plumbers and of the public were elected to act on the District Council. Among those elected to represent the public were the Mayor, the Chairman of the Sanitary Committee, the Chairman of the Leicester Technical School, the Medical Officer of Health, the Borough Surveyor, and the Engineer to the Water Department.

**New Opera House at Christiania.**—A new opera house and theatre is to be built at Christiania, but the committee having the scheme in hand has not yet decided whether this is to be exclusively a Norwegian or an international competition, half the members being in favour of the former and the other half in favour of the latter. The building is to be situated opposite the University, and close to the Royal Palace, on lands granted by the Government, for which reasons the designs for the building have to obtain the final approbation of King Oscar. The house is to cost about £35,000, exclusive of fitting-up, electric and heating installations, &c., and must offer accommodation for 1,500 persons. The area of the grounds is 2,500 square metres. Two premiums are to be given for the best designs, one for £140 and one for £85. A jury of five members is to adjudicate upon the designs.

**The Corinth Canal.**—The work of cutting through the isthmus of Corinth is reported to suffer under the same financial difficulties as the Panama Canal work. A German technical journal states that when the subscription was opened for the carrying out of the scheme in 1882, estimated to cost thirty million francs, and to be finished in six years, the money was subscribed five times over. In 1887, however, this sum had been expended, and a further sum of thirty million francs was invited. However, up to the present only a third of this sum has been obtained, and if no further funds can be obtained the work on the canal will soon have to be stopped. Hitherto about two-thirds of the earthworks have been executed, but there still remains a great deal to be done, and it is now stated that as the canal will cost twice as much as originally estimated, no profits can be anticipated.

**The English Iron Trade.**—The tendency in the English iron market is still upwards, notwithstanding various adverse influences, such as the nearness of the quarterly meetings, uncertainty as to cost of raw materials and labour, and the crash in the copper trade. There is a firm feeling in pig-iron. The Glasgow warrant market has been quite as active as during the last two or three weeks, and although prices of warrants have changed but little, Scotch makers are still advancing their quotations. Cleveland iron is also 6d. a ton higher, and Bessemer iron in the north-west is about the same as last week. Pig-iron is strong in other districts, and rising in value. Manufactured iron is somewhat quieter in England, but in Scotland there continues an excellent demand. Notwithstanding the comparatively slower state of trade, in the North of England finished iron is about 2s. 6d. a ton dearer this week, and prospective advances are spoken of in Scotland. Tinplates are improving in demand, and large orders are reported to be in the market, which are delayed owing to the uncertainty with regard to raw material and wages. Steel is in undiminished heavy consumption, and prices are very stiff. As much as 4l. 12s. 6d. is asked for heavy rails in the North. In ship-building an accession of fresh orders has to be noted, but some owners are holding back on account of the great increase in the cost of tonnage. Engineers continue very busy.—Iron.

**Metal Works for Sale.**—The Burry Port Lead and Silver Works, in Carmarthenshire, and the Briton Ferry Ironworks, in Glamorganshire, will shortly be put up for sale, by auction, at the Mart. The ironworks, until lately in operation, cover a total area exceeding 17 acres, on the river Neath, and are stated to be capable of turning out 600 tons of manufactured iron weekly. The property is held under three leases of ninety-nine years, from January, 1847, at ground-rents of 515l. per annum in all, with way-leaves and other dues; these may be consolidated into one fresh lease for ninety-nine years. Intersected by lines in communication with the Great Western Railway, the works lie near to the Rhondda and Swansea Bay Railway, which, when completed, will afford ready access to the South Welsh coal and ironstone districts. The Burry Port Works are said to be equal to about 200 tons of lead per week, and have plant for the extraction of silver. They extend over about 23½ acres, situated on the Bristol Channel. The property for sale includes a row of twenty cottages, and a chapel, a foundry, and a freehold ground-rent of 111l. 5s. per annum, derived from Messrs. Risley & Burmann's adjoining white-lead works.

**Elastic Sandstone.**—What is known as itacolumite, or elastic sandstone, is found in California, Georgia, and other localities in the United States, and a whole mountain of it, it is stated, exists in Southern Nevada, a short distance east of Death Valley. Itacolumite is nearly always to be met with in regions producing the diamond, and is the reputed matrix of that gem. A piece of this elastic sandstone, about 6 in. long, 1 in. wide, and ½ in. thick, is in the possession of the Mining and Scientific Press (San Francisco), which is as flexible as a piece of india-rubber. Another piece, 13 in. long, 2½ in. wide, and ½ in. thick, is in the office of the acting chief clerk of the United States War Department, Washington, and said to possess equal flexibility, but being, without doubt, a genuine stone. No practical use has as yet been made of the stone, but it would appear to be useful for elastic foundations for machinery, to prevent vibration, such as are now being introduced in America. At any rate, it is a geological curiosity.

**An Elastic Wheel.**—A wheel has been patented by Mr. James Arnott, in which the spokes are inserted into a circular cushion of india-rubber in a groove round the nave of the wheel, with holes for the insertion of the spokes, which, however, are made with a shoulder bearing on the surface of the india-rubber. It is claimed that this produces practically an elastic wheel, lessening the wear and jar at the junction of the spokes with the nave, and rendering the running smoother.

**Messrs. Perry & Co.'s Staff.**—On Saturday evening last the in and outdoor staff of Messrs. Perry & Co., builders, Bow, held their annual smoking concert at Winchester House, Old Broad-street, E.C., with Mr. H. H. Bartlett in the chair. About 450 invitations were accepted, and a very pleasant evening was spent.



PRICES CURRENT OF MATERIALS.

| TIMBER.                       |          | £. s. d. | £. s. d. |
|-------------------------------|----------|----------|----------|
| Heart, B.G.                   | ton      | 6 10 0   | 7 10 0   |
| Heart, E.I.                   | load     | 10 0 0   | 13 0 0   |
| Heart, S.I.                   | load     | 0 2 3    | 0 3 0    |
| Heart, Canada                 | load     | 3 10 0   | 5 0 0    |
| Heart, Yellow                 | load     | 3 10 0   | 6 0 0    |
| Heart, Danzig                 | load     | 4 0 0    | 5 0 0    |
| Heart, Baltic                 | load     | 2 10 0   | 4 10 0   |
| Heart, Canada                 | load     | 5 10 0   | 7 10 0   |
| Heart, Canada red             | load     | 3 5 0    | 4 0 0    |
| Heart, Yellow                 | load     | 3 10 0   | 5 10 0   |
| Heart, Danzig                 | fathom   | 4 10 0   | 5 10 0   |
| Heart, Petersburg             | load     | 5 0 0    | 6 10 0   |
| Heart, Riga                   | load     | 2 15 0   | 4 5 0    |
| Heart, Odessa                 | load     | 0 0 0    | 0 0 0    |
| Heart, Finland, 2nd and 1st   | std. 100 | 9 10 0   | 11 0 0   |
| Heart, 4th and 3rd            | std. 100 | 8 0 0    | 9 0 0    |
| Heart, Petersburg, 1st yellow | std. 100 | 11 10 0  | 15 0 0   |
| Heart, 2nd                    | std. 100 | 10 0 0   | 11 0 0   |
| Heart, white                  | std. 100 | 8 10 0   | 10 10 0  |
| Heart, Sweden                 | std. 100 | 9 10 0   | 17 0 0   |
| Heart, White Sea              | std. 100 | 18 0 0   | 23 0 0   |
| Heart, Canada, Pine, 1st      | std. 100 | 11 0 0   | 17 0 0   |
| Heart, 2nd                    | std. 100 | 0 5 0    | 10 0 0   |
| Heart, Spruce, 1st            | std. 100 | 9 10 0   | 11 0 0   |
| Heart, 3rd and 2nd            | std. 100 | 7 10 0   | 9 10 0   |
| Heart, New Brunswick          | std. 100 | 6 15 0   | 8 15 0   |
| Heart, all others             | std. 100 | 6 10 0   | 20 0 0   |
| Heart, pared, First           | std. 100 | 0 11 0   | 0 14 6   |
| Heart, Second                 | std. 100 | 0 8 0    | 0 10 8   |
| Heart, Third                  | std. 100 | 0 5 0    | 0 7 0    |
| Heart, Cuba                   | std. 100 | 0 0 4    | 0 0 4    |
| Heart, Honduras               | std. 100 | 0 0 4    | 0 0 4    |
| Heart, Shagbany               | std. 100 | 0 0 4    | 0 0 4    |
| Heart, St. Domingo            | std. 100 | 0 0 4    | 0 0 4    |
| Heart, Mexican                | std. 100 | 0 0 4    | 0 0 4    |
| Heart, Tobasco                | std. 100 | 0 0 4    | 0 0 4    |

TIMBER (continued).

|                                   |      |        |        |
|-----------------------------------|------|--------|--------|
| Mahogany, Honduras, cargo average | ton  | 0 0 0  | 0 0 0  |
| Box, Turkey                       | ton  | 4 0 0  | 13 0 0 |
| Rose, Rio                         | ton  | 15 0 0 | 20 0 0 |
| Bahia                             | ton  | 14 0 0 | 18 0 0 |
| Satin, St. Domingo                | foot | 0 0 0  | 0 0 3  |
| Porto Rico                        | ton  | 0 0 9  | 0 1 3  |
| Walnut, Italian                   | ton  | 0 0 4  | 0 0 6  |

METALS.

|                            |     |        |        |
|----------------------------|-----|--------|--------|
| Iron—Bar, Welsh, in London | ton | 5 5 0  | 5 10 0 |
| at works in Wales          | ton | 4 15 0 | 5 0 0  |
| Staffordshire, in London   | ton | 5 10 0 | 6 10 0 |

|                         |     |        |        |
|-------------------------|-----|--------|--------|
| COPPER.                 |     |        |        |
| British, cake and ingot | ton | 0 0 0  | 0 0 0  |
| Best selected           | ton | 46 0 0 | 48 0 0 |
| Australian              | ton | 0 0 0  | 0 0 0  |
| Chili, bars             | ton | 39 0 0 | 41 0 0 |
| YELLOW METAL            | lb. | 0 0 0  | 0 0 0  |
| LEAD—Pig, Spanish       | ton | 0 0 0  | 0 0 0  |
| English, common bars    | ton | 0 0 0  | 0 0 0  |
| Sheet, English          | ton | 0 0 0  | 0 0 0  |

|                  |     |        |        |
|------------------|-----|--------|--------|
| SPELTES.         |     |        |        |
| Silesia, special | ton | 17 5 0 | 17 7 8 |
| Ordinary brands  | ton | 17 2 6 | 17 0 0 |

|                    |     |         |        |
|--------------------|-----|---------|--------|
| TIN.               |     |         |        |
| Straits            | ton | 93 0 0  | 0 0 0  |
| Australian         | ton | 93 15 0 | 0 0 0  |
| English ingots     | ton | 98 0 0  | 0 0 0  |
| ZINC—English sheet | ton | 21 0 0  | 22 0 0 |

|                        |        |         |         |
|------------------------|--------|---------|---------|
| OILS.                  |        |         |         |
| Linsseed               | ton    | 18 2 6  | 18 7 6  |
| Cocoon, Ceylon         | ton    | 27 0 0  | 24 0 0  |
| Ceylon                 | ton    | 25 10 0 | 25 15 0 |
| Palm, Lagos            | ton    | 23 10 0 | 0 0 0   |
| Rapeseed, English pale | ton    | 28 0 0  | 28 10 0 |
| do brown               | ton    | 26 15 0 | 27 0 0  |
| Cottonseed, refined    | ton    | 23 10 0 | 0 0 0   |
| Tallow and Oleins      | ton    | 19 0 0  | 45 0 0  |
| Lubricating, U.S.      | ton    | 5 0 0   | 8 0 0   |
| do refined             | ton    | 7 0 0   | 12 0 0  |
| Tar—Stockholm          | barrel | 1 2 0   | 1 2 6   |
| Archangel              | barrel | 0 14 0  | 0 14 6  |

HANWELL.—For the construction of new effluent water and subiding tanks, the formation of sludge-bed, &c., and alterations to the present works, for the Hanwell Local Board, at their sewage outfall works. Mr. E. J. W. Herbert, Surveyor to the Hanwell Local Board.—  
B. Cooke & Co., 2809 15 0  
J. Mackay ..... 784 5 11  
J. G. Potter ..... 768 0 0  
A. Kellatt ..... 769 2 6  
W. Cunliffe ..... 728 12 6  
W. Parker ..... 723 0 0  
G. Bell ..... 714 0 0  
A. & B. Hanson ..... 677 14 8  
G. Gibson (accepted) ..... 626 17 7  
[Surveyor's estimate, £692, ss. 2d.]

LONDON.—For erecting All Saints' Church, West Dulwich. Mr. Geo. H. Fellowes Fryars, architect, 10, Torrington-square, London. Quantities supplied by Mr. R. Henry Hale, 6, Duke-street, Strand:—  
Mark Martin, Eastbourne ..... 222,143  
Abley, Salisbury ..... 20,240 0 0  
Perry & Co., London ..... 2,068 0 0  
Joseph Martin, Eastbourne ..... 19,977 0 0  
Kynoch & Co., London ..... 9,585 0 0  
Dove Bros., London ..... 19,409 0 0  
Bull & Son, Southampton ..... 18,946 0 0  
Bower Bros., Newwood ..... 18,930 0 0  
Goddard & Son, Farnham ..... 18,909 0 0  
Rowse, Plymouth ..... 14,987 0 0  
Revised Tenders asked from the last four named firms.  
Rowse ..... 17,935 0 0  
Bull & Son ..... 17,760 0 0  
Goddard & Son ..... 17,619 0 0  
Bower Bros. .... 17,544 0 0  
\* Tender for eastern portion of work accepted conditionally.

LONDON.—For roads and sewers at the Broomwood Park Estate, Wandsworth Common. Mr. W. Newton Dunn, architect and surveyor, Bucklebury:—  
Treherne & Co. .... £2,585 0 0  
Hayter ..... 2,563 0 0  
Wilson ..... 2,540 0 0  
Bell ..... 2,143 0 0  
James Neal ..... 2,034 0 0  
Adam ..... 1,992 12 0  
Iles ..... 1,990 17 6  
Peill & Sons ..... 1,943 0 0  
Nicholls ..... 1,824 8 0  
Blackmore ..... 1,820 0 0  
George Neal & Co., Limited\* ..... 1,673 12 6  
Saunders ..... 1,659 7 0  
\* Accepted.

LONDON.—For rebuilding No. 15, Langham-st., W.:—  
Colls & Son ..... £2,795 0 0  
Holiday & Greenwood ..... 2,613 0 0  
Stevenson ..... 2,588 0 0  
Lawrence ..... 2,583 0 0  
Downs ..... 2,534 0 0  
Brickell ..... 2,585 0 0  
Green & Lee (accepted) ..... 2,548 0 0

LONDON. For additions and alterations to premises at 201, Lyham road, Brixton-hill, S.W., for the East Surrey Co-operative Society, Limited:—  
Fitness Bros. .... £230 0 0  
Lyne & Smith ..... 230 0 0  
H. Britton ..... 230 0 0  
Young & Lonsdale ..... 230 0 0  
Garrett & Son (accepted) ..... 185 0 0

LONDON.—For building billiard-rooms, &c., at the "Ride Volunteer" public-house, High-road, Kilburn, for Mr. Thos. Goddard, Mr. Joseph G. Needham, architect, 11, Powerscroft-road, Lower Clapton, N.E.:—  
Williams & Son ..... £249 0 0  
H. B. Oldrey ..... 238 0 0  
G. Mower ..... 798 0 0  
S. Barnett ..... 765 0 0  
E. Canington ..... 745 0 0

LONDON.—For alterations to the "Postman's Knock" public-house, Cambridge-road, E. Mr. Joseph G. Needham, architect, 11, Powerscroft-road, Lower Clapton, N.E.:—  
Coulson Bros. .... £247 0 0  
J. & F. Bano ..... 233 0 0  
S. W. Hawkins ..... 219 0 0

LONDON.—For alterations and additions to the Branch School (Marionist-road), Hammersmith, for the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied:—  
Simmonds Bros. .... £532 0 0  
G. Godson ..... 499 0 0  
H. Haynes ..... 479 0 0  
R. Cox ..... 430 0 0  
Flew & Co., 5, West Kensington-terrace, W. (accepted) ..... 400 0 0

LONDON.—For the enlargement of the Netherwood-street School, Kilburn, by 588 places, for the School Board for London. Mr. T. J. Bailey, architect:—  
Atherton & Latts ..... £3,174  
Stimpson & Co. .... 7,730  
Hart Bros. .... 7,691  
H. L. Holloway ..... 7,638  
Caplen & Redgrave\* ..... 7,697  
\* Amended tender, £9,772, recommended by the Works Committee for acceptance.

LONDON.—For erecting a boundary-wall on the south-side of the Tooting Graveyard site, for the School Board for London. Mr. T. J. Bailey, architect:—  
W. J. Richards ..... £ 33 0 0  
King Brothers & Co. .... 171 0 0  
A. M. Deacon\* ..... 164 0 0  
\* Recommended by the Works Committee for acceptance.

LONDON.—For alterations and additions to the "Bag-nidge Walls" public-house, for Messrs. Bacon Bros., King's-Cross-road. Mr. Charles Young, architect, 70, Finsbury-pavement, E.C.:—  
Patman & Fotheringham ..... £3,187 0 0  
Drew & Cadman ..... 3,893 0 0  
Godfrey ..... 2,770 0 0  
Burman & Son ..... 2,675 0 0  
Downs ..... 2,643 0 0  
Mowat & Son ..... 2,588 0 0  
Veal ..... 2,395 0 0

COMPETITION AND CONTRACTS.

Epitome of Advertisements in this Number.

COMPETITION.

| Nature of Work.                            | By whom Required. | Premium.    | Designs to be delivered. | Page. |
|--------------------------------------------|-------------------|-------------|--------------------------|-------|
| tol, Shops, and Premises, Newtwn, N. Wales | 25/.              | Not stated. | ii.                      |       |

CONTRACTS.

| Nature of Work, or Materials.               | By whom Required.                   | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|---------------------------------------------|-------------------------------------|-----------------------------------|--------------------------|-------|
| General Paving Works                        | West Ham Council                    | Lewis Angell                      | Mar. 26th xi.            | xi.   |
| Broken Guernsey Granite                     | do.                                 | do.                               | do.                      | xi.   |
| Press and Works                             | Reading Corporation                 | A. W. Parry                       | Mar. 28th xi.            | xi.   |
| Broken Granite and Stone Slags              | Ramsay Local Board                  | Official                          | Mar. 29th xi.            | xi.   |
| Stretcher, Tenly                            | Admiralty                           | do.                               | do.                      | xi.   |
| Marblestone Footway Pavements               | Birmingham Public Works Committee   | W. S. Tili                        | Mar. 30th xi.            | xi.   |
| Low Road and Culvert, Windsor               | do.                                 | T. V. H. Dudgeon                  | Mar. 30th xi.            | xi.   |
| rick Sewer, and                             | Paddington Vestry                   | Official                          | April 1st xi.            | xi.   |
| making-up Roads                             | Finchley Local Board                | G. W. Brunell                     | do.                      | xi.   |
| orks and Materials                          | do.                                 | do.                               | do.                      | xi.   |
| rops and St.iling, Hampstead                | do.                                 | E. Monson, Jan.                   | Apr. 2nd xi.             | xi.   |
| removal of Road Sweepings and Road Watering | Hackney Bd. of Works                | J. Lovegrove                      | do.                      | xi.   |
| erbing, Tar-paving, Metalling, &c.          | Leisham Bd. of Wks.                 | Official                          | do.                      | xi.   |
| erface Waterworks                           | Wimbledon Local Bd.                 | W. Santo Crimp                    | do.                      | xi.   |
| po Sewers                                   | Hamwell Local Board                 | E. J. W. Herdier                  | Apr. 3rd xi.             | xi.   |
| erage Works                                 | Chiswick Local Board                | A. Ramaden                        | do.                      | xi.   |
| admaking, Paving, Sewers, &c.               | Fulham Vestry                       | J. P. Norrington                  | do.                      | xi.   |
| armacy, &c.                                 | Dartford Local Board                | G. H. Tait                        | April 5th xi.            | xi.   |
| lectric Fire Signal System                  | Mar. Asylum Board                   | A. & C. Harston                   | April 6th xi.            | xi.   |
| ive Extinction Appliances                   | do.                                 | do.                               | do.                      | xi.   |
| ives, Sluices, &c.                          | Manchester Corporation              | G. H. Hill                        | April 9th xi.            | xi.   |
| ive Steel Bridge, &c.                       | Ferriard Ferry Bridge Commissioners | Sir John Cooke                    | April 13th xi.           | xi.   |
| azed Stoneware Sewer Pipes, &c.             | Bath U.S.A.                         | C. R. Fortune                     | April 16th xi.           | xi.   |
| inery Buildings, &c.                        | Buton (Surrey) L. Bd.               | Official                          | April 17th xi.           | xi.   |
| urchase and Pulling down of B. Building     | School Bd. for London               | do.                               | Not stated.              | xi.   |
| ing Down and Clearing Houses, Deptford      | do.                                 | C. Bell                           | do.                      | xi.   |

TENDERS.

[Communication for insertion under this heading must reach us not later than 12 Noon on Thursday.]

BURSLIM.—For the erection of new printing works. Mr. W. Swann. Mr. A. B. Wood, architect, Tunbridge Wells. Quantities supplied:—  
J. J. Longden, Burslem ..... £1,189 0 0  
T. Critchlow, Burslem ..... 1,146 0 0  
C. Corrales, Halesley ..... 1,145 0 0  
Cooper & Jones, Tunstall ..... 1,085 0 0  
Yorke & Goodwin, Tunstall ..... 1,073 0 0  
J. Bowden, Burslem ..... 1,050 0 0  
W. Grant, Burslem ..... 1,050 0 0  
C. Cope, Tunstall ..... 896 0 0  
W. Cooke, Burslem (accepted) ..... 991 0 0

BURSLIM.—For additions and alterations to Hill Top Chapel. Mr. A. B. Wood, architect, Tunstall. Quantities supplied:—  
Contract No. 1.—Alterations to School.  
W. Grant, Burslem (accepted) ..... £750 0 0  
Contract No. 2.—New Vestries and Balcony.  
W. Cooke, Burslem ..... £593 0 0  
W. Grant, Burslem (accepted) ..... 510 0 0  
C. Cope, Tunstall ..... 503 0 0

CLONMACANNA (Co. Mayo, Ireland).—For the erection of Clonmacanna Bridge, for the Grand Jury of the County of Mayo. Mr. Wm. Patterson Orchard, B.E., County Surveyor North Mayo, engineer:—  
John Cunningham, 3, Lombard-street, Dublin ..... £3,338 15 9  
James Goodwin & Co., Motherwell, near Glasgow ..... 2,684 12 8  
Alexander Finlay & Co., Motherwell, near Glasgow (accepted) ..... 2,289 14 6

COLCHESTER.—For pulling down and rebuilding new stables and laundry at the "Red Lion" Hotel, for Messrs. Daniel & Sons' Breweries, Limited. Mr. J. W. Start, architect, High-street, Colchester:—  
C. Shephard ..... £733 0 0  
C. Oldridge ..... 730 0 0  
Grinwood & Sons ..... 695 0 0  
T. J. Ward ..... 650 0 0  
A. Chambers ..... 639 0 0  
W. Sheel, jun. .... 584 0 0  
G. Dobson ..... 577 0 0  
F. Dupont (accepted) ..... 567 0 0  
A. Dis ..... 500 0 0

CROYDON.—For the erection of two detached villareidences, Camden-road, Croydonhurst, Croydon. Mr. E. C. Homer, architect, 89, Gresham-street, E.C.:—  
A. Nash (accepted) ..... £2,206 0 0

DEAL (Kent).—For alterations and repairs to five houses, Prince of Wales-terrace, Deal, for the Conservative Land Society, 31, Norfolk-street, Strand, W.C.:—  
W. & S. Denne, Upper Walmer ..... £778 0 0  
W. Soeven, Iltington ..... 769 0 0  
R. C. Bateman ..... 724 0 0  
W. Martin, Ramsgate ..... 648 0 0  
W. H. Brown, Deal ..... 639 0 0  
Harvard & Parnor, Folkestone ..... 638 0 0  
J. & J. Wise, Deal ..... 598 0 0  
T. & W. Chandler, Deal ..... 598 7 6  
Denne & Son, Deal ..... 547 0 0  
Duff & Kirrage, Upper Holloway\* ..... 450 0 0  
\* Accepted.

DOWNTON.—For erecting farm buildings at Downton. Mr. W. C. Charles Evans, architect, 38, Post-office-corner, Westminster:—  
Gregory & Hudson, London ..... £1,087 0 0  
St. vena Bros., Southampton ..... 971 0 0  
Rushley Bros., Lymington ..... 945 0 0  
G. Bevan, Bournemouth (accepted) ..... 837 0 0

**LONDON.**—For external repairs to the Infirmary Buildings, &c., Cale-street, Chelsea, for the Chelsea Guardians. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied.—  
G. Searle, Chelsea (accepted)..... £475 0 0

**MARCH (Cambs.).**—For alterations and additions to shop and premises at No. 4, High-street, for Mr. Edward C. Haylock. Mr. William A. Burr, architect, 65, Chancery-lane, W.C. :—  
Swann..... £425 0 0  
Collingwood & Son..... 332 0 0  
Whitney..... 333 9 8  
Ward (accepted)..... 290 19 0  
[All of March.]

**MILFORD-ON-SEA (Hants.).**—For the erection of Downton House. Mr. W. Charles Evans, architect, 34, Post-office-corner, Westminster :—  
Rashley Bros., Lymington, Hants\* ..... £774 0 0  
\* Accepted.

**ST. LEONARD'S-ON-SEA.**—For shop-front and studio at 81, Bohemia-road, St. Leonard's-on-Sea, for Mr. S. Perrett. Mr. Julian Downborough, architect, Bexhill-on-Sea :—  
Foster & Phillips, Hastings..... £232 10 0  
C. Hughes, Bexhill..... 207 0 0  
A. H. White, St. Leonard's..... 194 15 0  
Alfred Ashdown St. Leonard's..... 194 0 0  
H. Russell, Bexhill..... 167 0 0  
T. Squirell, Bexhill..... 151 0 0  
F. J. Crutenden, St. Leonard's\* ..... 147 0 0  
\* Accepted.

**SYDENHAM.**—For completion of house at Sydenham :  
F. Carter, Brady Works, Bethnal Green (accepted)..... £300 0 0  
[No competition.]

**TOTTENHAM.**—For the erection of temporary iron school buildings, play-grounds, &c., for the Tottenham School Board. Mr. Charles Bell, architect, 3, Salter's Hall-court, E.C. Quantities by Messrs. D. Campbell & Son, 69, Finsbury-pavement, E.C. :—  
Schools, &c. Fittings.  
Furt & Co. .... £2,137 0 0 ..... £230 0 0  
J. Kellaway..... 1,881 0 0 ..... 244 0 0  
J. Linnell..... 1,845 0 0 ..... 216 0 0  
E. Spencer & Co. .... 1,728 0 0 ..... 206 10 0  
Crosgen & Co. .... 1,485 0 0 ..... 250 0 0  
C. Wall..... 1,393 0 0 ..... 194 0 0  
H. Knight & Son ..... 1,383 0 0 ..... 199 0 0  
W. Harbrow..... 1,329 10 0 ..... 212 0 0  
D. Crowe, 27, Highgate-road\* ..... 1,161 0 0 ..... —  
\* Accepted.

**TUNSTALL.**—For the erection of a group of buildings, comprising Science and Art School, Free Library, Public Baths, Fire Engine Station, and Town Yard Buildings. Mr. A. R. Wood, architect, Tunstall :—  
Cooper & Jones, Tunstall..... £10,137 0 0  
Cooke, Burslem..... 9,985 0 0  
Bradney & Co., Wolverhampton ..... 9,795 0 0  
Gresvener, Tunstall..... 9,455 0 0  
Cope, Tunstall..... 9,388 0 0  
Smith, Tunstall..... 9,180 0 0  
Rowden, Burslem..... 9,075 0 0  
Walkerding, Derby..... 8,960 0 0  
Goodwin & Yorks, Tunstall..... 8,952 0 0  
\* Accepted.

**TUNSTALL.**—For the erection of a seven-oven manufactory, at Brownhills. Mr. A. R. Wood, architect, Tunstall. Quantities supplied :—  
Cooper & Jones, Tunstall..... £210,552 0 0  
C. Smith, Tunstall..... 10,217 0 0  
J. Yorks, Tunstall..... 10,000 0 0  
N. Barlow, Stoke-on-Trent..... 9,970 0 0  
J. Bowden, Burslem..... 9,800 0 0  
W. Cooke, Burslem..... 9,711 0 0  
C. Cornes, Tunstall..... 9,075 0 0  
C. Cope, Tunstall..... 8,038 0 0  
J. Procter, Tunstall (accepted)..... 8,090 0 0  
For Engine, Boilers, and other Machinery.  
Hartley, Arnoux & Fanning, Stoke-on-Trent (accepted) ..... 1,940 0 0

**TWICKENHAM.**—For forming new road at Twickenham, Middlesex, sewer and kerbed. Mr. Herbert B. Saunders, architect and surveyor, 16, Walbrook, London, E.C. :—  
C. Killingback, Camden Town..... £1,192 0 0  
S. Atkins, Kingston..... 790 0 0  
G. Neal & Co, Wandsworth..... 789 0 0  
F. W. Milman, New Cross..... 693 0 0  
Woodham & Fry, Greenwich..... 609 0 0

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### Sanitary Town Houses: some minor details.



THE sanitation of dwelling-houses in town and country, in regard to the most important matters connected with drainage, may now be regarded as having arrived at the dignity of an exact science, the main principles of which are well understood, and in regard to which there is reliable information and advice to be obtained by those who require it. In regard to the mechanical means for achieving the most perfect drainage, taking away from the house everything that should not remain in it, and preventing the access of anything in the way of air-borne pollution which ought not to find its way in, we shall no doubt go on discovering improvements from time to time; but all who have given thought to the subject are pretty well agreed as to the principal objects to be kept in view. Ventilation is as yet far from being an exact science; theory and practice in regard to the best means of attaining it differ widely; but we have at least arrived at a consensus of opinion, among educated persons, that ventilation is a matter of great importance, even in a private house, and that there is a certain barbarity in collecting a large number of people in a comparatively small dining-room and providing no means for changing the air which they are breathing, except by the simple but rather hazardous expedient of throwing open a window. But there are some minor matters in connexion with the construction of town houses, not coming under the generally-accepted definition of sanitation, which nevertheless are very deserving of attention, if houses in crowded towns are to be kept in the most healthy condition attainable.

The distinction which we have in our mind, as between town and country houses, is in relation mainly to the condition of the atmosphere in which they are placed, and to some extent also in regard to the difference of their surroundings in other respects. A house built in the open country may be assumed to be, in the first place, permeated by a pure and healthy atmosphere. It may, from an injudicious choice of site, be subjected to a damp-laden atmosphere; but this is an evil which can be avoided beforehand at all events, if not after-

wards. If the site has been well chosen in this respect, there is little fear that the air will bring with it any other ingredients injurious to the health of the inmates. But the air which circulates (provided it has proper opportunities of circulating) through the rooms of a house in a large town is laden with impurities of all kinds which cannot be got rid of or stopped out. Where the air goes, its burden of matter goes with it; and a great deal of this is matter mechanically carried, and which is deposited wherever the current of air is checked, in that visible and tangible form which we call collectively "dust." Moreover, a house on a town site is in most cases much more contracted in regard to space than a house of similar class built in the country. The country house has plenty of space round it for various requirements which in the town house must be provided for indoors, within the limits of certain confining walls. Hence the town house tends to develop many unlit corners, crannies, cupboards &c., where dust and dirt collect, often containing probably putrefying substances, which are left for a long time undisturbed, and assist in rendering the air of the house unwholesome. Every dweller in London, and every one working in a London office, knows that a room cannot be left for a single day without being found coated with dust and soot on every horizontal surface where it can drop and remain. In public buildings the air can be washed and strained before delivery into the building, to some extent at all events; but considerations of cost as well as of space preclude the carrying out of such precautions in most private houses in towns. We have to take our air for the most part as we find it, with all its accompaniments. But as the air is continually depositing part of its load of impurities on the walls, floors, and furniture of the house, it is desirable at all events that what it brings in and leaves in this palpable form should not be allowed to accumulate and create further contamination. Accepting the proverbial saying that dirt is "matter in the wrong place," the object should be to leave it no place which it can thereby make "wrong."

One of the most practical steps towards this end is to leave, in town houses more especially, no places which cannot be daily seen and easily got at. In regard to this object the whole class of erections which are generically known as "casings" are among the most fertile sources of insanitary conditions in town houses. A casing is essentially

a superficial shell or incrustation put up in order to hide something which is supposed to be unsightly. What is quite certain is, that wherever such screens are put up, whatever is behind them will very soon be unsightly in the sense of being unfit to be looked at, whether it is actually looked at or not. "Mieux être que paraître," says an old French proverb; a corner full of dust and dirt is no less an evil, but perhaps even a greater, because it is "cased" away out of sight. One of the most important improvements made of late years in connexion with water-closets has been the invention of the form which was first known as the pedestal closet, in which the earthenware basin with its trap is made in one piece, standing openly on the floor with no casing or concealment of any kind. This has come into fairly extensive use; but it ought, in one or other of its forms, to be the one closet admitted into houses. Some of the old-fashioned specifications used to specially demand that the woodwork of these decorous cribs should be screwed so as to be easily removable "when required"; but when was it required? Only when repairs to the D-traps and "container" and its appurtenances were imminently necessary. Then the dark recesses were thrown open, not however to be cleansed, only to be screwed up and left to collect a fresh harvest of dirt and decay. In the houses where this kind of dirt-screen has been disestablished, and the open basin substituted, there is still a superstition in favour of casing-up the supply-cistern which modern sanitary science has interposed between the main house-cistern and the water-closet. It is placed on a wooden shelf and a panelled wooden screen fixed in front of it. Let this be done away with. The supply-cistern, or "water waste preventer" (as it is sometimes called) is not an object of beauty, certainly; but it is better to leave it exposed to view, rather than case it up to provide another pocket for the collection of dust. Another ancient and respectable superstition is that the bath must be surrounded with casing, and have a polished baywood or mahogany top fixed round it. Here is another lurking-place, never opened or looked at, for dirt and possible seeds of disease: and for what object? There might be some excuse for concealing the multifarious "cranks and wires" of the old-fashioned water-closet apparatus; but a simple bath, a large receptacle for water, is surely an object which may legitimately be displayed to the naked eye. There is nothing ungainly in it; no pretext



for casing it up in wooden cradles and making believe that it is built of wooden panelling. Even the ordinary japanned iron bath is better shown as it is than hidden in a cupboard of gimcrack joinery. Let it stand out into the room, clear of either wall and with no concealment, so that it can be seen and got at all round, and kept clean and wholesome as it should be. This of course applies still more decidedly to baths of terra-cotta (among the best for those who cannot afford costly materials) and enamelled slate, and other such materials, more suitable than iron inasmuch as they have no paint to wash off and get shabby. Things to be constantly filled with water, and have water splashed about them, should be made of such materials as water will not deface or demolish. What can be more repellent (to the eye) than an iron bath with half the paint washed off the interior? It may not be insanitary, but it looks so, and suggests ideas opposite to cleanliness, which should always be the prevailing suggestion of a bath-room. While on the subject of bath-rooms, let us once more enter a protest against the odious system, still to be met with, of making the water-closet an adjunct of the bath-room. The idea is unworthy of any civilised people. The two things are the very last that should go together. The bath-room should suggest no idea or facts but those of entire cleanness and freedom from all connexion with drainage pollution. Another point of importance is the flooring of the bath-room. Not unfrequently, in houses of ordinary make, the position of the bath-room on the second floor is quite obvious in the state of the plaster ceiling of the drawing-room or some other room on the first floor. The bath-room, if it is honestly used, is a room in which much water is likely to be spilt. It is a common habit to floor it with oilcloth or linoleum on this account; but the water will make its way between this and the skirtings and "casings" of the bath, and fill the joists and the ceiling beneath with water. A bath-room should be made with a cement floor on rolled iron joists, with a slight fall and with a groove at the edge to run off water. It is easy to place movable matting, or wooden grids or cork tablets, for the feet. A wooden-floored bath-room is sure to be a nuisance in the long run. It lets water through, and becomes in itself damp and clammy, and with a rotten odour hanging about it. For similar reasons washstands with wooden tops are to be deprecated. They are never really clean and wholesome after any length of use.

It is important that the cistern (where there is only an intermittent supply) should be so placed that it is easily seen and easily got at, and that everything surrounding it should be capable of being kept clean without any special preparation for the cleansing operation. Cisterns are too generally placed as if the principal object were to forget their existence, unless when once in two years or so they are subject to a cleaning out: many people forget or ignore even that too moderate amount of cleaning. Instead of the cistern being hidden away in a dark hole, with a trap-door for access only to be reached by a ladder which is never forthcoming, it should be placed where a constant eye can be kept upon it, and where all dirt can be carefully removed from its vicinity. It is a question whether pipe casings, even when hinged and screwed, are not snares and traps for dirt; whether it would not be better either to leave them uncased in front, or to cover them only with a mesh of iron wire, which would conceal them to some extent from casual observation, while leaving the chase and the pipes fixed in it open to constant inspection. In a town house, what with decay and dust and possible vermin of various sorts, one never knows what is going on in hollow places of any kind that are concealed from view. The more you can have every surface under the eye and under the scrubbing-brush the better for the sanitary condition of the habitation. And we have not half done yet with the casing-system, which pervades our modern houses everywhere. In one sense sash windows are

perhaps the most convenient form of window for opening and shutting that has been invented, at least for crowded houses in towns; some objections which apply to them in towns hardly seem to have force in a country house; there is room there to open a casement window, inward or outward, without knocking anything or anybody down; but you cannot expect this in a town. But the prevalent system of hanging sash windows is decidedly objectionable in a sanitary point of view and in town houses. There you have every window in the house with a system of gimcrack wooden cradling on each side of it, with irregular vacant galleries between it and the brickwork or stonework; supposed, indeed, to be filled up solid with mortar and debris, but how often is this really done, and what is the worth of such filling when it is done? We do not know what goes on in all those cavities; what progress of dry or other kind of rot, what accumulations of decaying rubbish, or what revels of various vermin. Is that the kind of way to build solid and sanitary dwellings for towns whose atmosphere is full of impurities which are carried into every cranny and crevice where air can circulate? We ought to have for our town houses solid-framed windows, with no "boxings and casings," in which all the woodwork is seen and no caverns are concealed behind it. Various ways have been suggested for hanging windows to open sash-wise in such frames, without the unscientific absurdity of lines and weights and pulleys; not all of them satisfactory, but it may be fairly argued that the worst of them is preferable to the hollow casing system, as regards sound and wholesome construction. Skirtings, in the way they are usually fixed, come under the category of casings. There is an inherited belief in the beauty of skirtings with large mouldings and considerable projection, and as we cannot afford to have these solid, the lower part is blocked out from the wall to allow room for the "bold" mouldings above; and the space behind becomes a gallery for mice, and a repository for the collection of the products of decay which lie there for generations undisturbed. All these dark and secret places, which we never get at, militate against the healthfulness of a dwelling, besides being architecturally flimsy and false construction. Much better to be content with a solid skirting of slight projection planted close against the wall.

Spaces under stairs are often very ill-looking after. With a desire to utilise part of the space, the stairs are cased up and a door hung, and boxes and all kinds of articles that are wanted out of the way are pushed into this dark cavern, the back of which is never seen from one year's end to another. Spaces like these, if boarded or partitioned up, should always be left with some provision for the access of light, so that they can be seen into at any time without the necessity of bringing a lighted candle on purpose to examine them, which is pretty certain never to be done. Light everywhere is one of the most important conditions of wholesomeness in a dwelling. Corners which are never seen are forgotten, and are not kept clean, because no one sees how much they require it.

In a town house we should deprecate all kinds of ornaments and mouldings which have much undercutting and many hollows in which dust and dirt will lodge. Plaster cornices with large hollow mouldings soon become full of dirt, which is seldom removed because it is not noticed, and the hollows cannot be dusted out from below. The state of things may, however, often be indicated to the eye that will look for it, by a dark line of dirt visible over the lower edge of the hollow moulding, showing how the moulding is coated. An experiment with a step-ladder and a duster would probably surprise the experimenter with the amount of dust he was preserving up there. For a similar reason the rich-looking embossed papers which are so much in favour now are not to be recommended for town houses. The flock ones are the worst, they are regular sponges for dust; but even the smooth-surface papers of this embossed

class collect a great deal of dust in the crevices and on the upper sides of their ornaments, and are much more difficult to keep properly clean than a smooth paper. Among the worst dust-traps in houses are the larger pieces of furniture, such as wardrobes and high book-cases, which are made with the old-fashioned sham cornice round the top, at a flat top several inches below the top of the cornice. This valley on the top of such furniture is in general never cleaned or looked at; owing to its construction it can neither be seen, nor can the dust be brushed off it without turning the whole erection over on its side; it is a place that seems carefully made as a dirt collector. All furniture should be made with a top unencumbered with any such bulwark, and so that it can be easily swept as often as is necessary to keep it clean.

It is a question whether their wall-papers, of a class which has just been referred to, should be encouraged at all for town houses. The nature of material has nearly as much influence on the cleanliness of a house as shape or construction. It may be said that all papers will hold more dirt than a hard finished and painted plaster surface, unless they be glazed papers, and those are objectionable in most situations on the ground of appearance. Beneath the paper also is the paste with which it is affixed, adding another decaying element. Papering is no doubt a temptingly easy way of producing a decorative effect; but hard-finished and painted plaster and washable "sanitary" paint is a better thing for the sweetness and wholesomeness of the home.

In regard to this portion of the subject materials, it is a question to be seriously considered whether we do not sacrifice healthfulness to appearance in the upholstery of windows with heavy and voluminous curtains. Most house windows, no doubt, are treated in internal design as to look unfinished without this drapery, and give more light than is desired. If windows were made rather smaller, and the architecture finished with the cornice of its own, so as to form a complete design in itself, rooms might appear less rich, perhaps, but would be more airy and more healthy than with heavy curtains. Colours may be imparted by the employment of stained glass in portions of the window. It would be necessary also to have shutters backs worked so as to be presentable in design when the shutters are closed.

Basement floors should be of cement, not of tiles or flags: anything laid with joints is sure to offer chinks some time or another for the entry of the enterprising blackbeetle. We believe it is quite possible, in finishing the basement of a house, to stop out these pests from any possibility of inroad except by walking in through the doors, by the roughly laid Portland cement floors with a cement skirting joining on to the floor with a rounded angle, so as to leave no actual corner. Corners are weak points; and more over the rounded-off angle is much more easy to keep thoroughly swept: corners in a basement are difficult to dislodge dust and debris from. Removable cocoanut matting or other similar coverings can be used for the kitchen floor, to prevent the floor being too cold.

The usual construction both of upper floors and roofs is full of drawbacks for town houses. The ordinary floor is a cavern never opened or looked into, between the ceiling and floorboards. The habitual adoption of a construction either of iron joists or of steel decking and concrete, with thick boarding on the top, will conduce to the wholesomeness of the habitation. So would the employment of flat roofs of the fireproof order. The sloping timber roof with a straight ceiling underneath leaves another of these unexplored caverns, the largest of all, for dirt and vermin to have their own way in. If this class of roof must be used, it is far the best to have it large enough to be entered and used as an attic for storage, instead of leaving it a mere "between-decks" space, unlighted and unexplored. Used as a boarded attic, even a small and low one, it must of necessity be lighted and have easy means of access. It is possible



then that it will be kept clean and wholesome; it is perfectly impossible it can be so when it is only a dark space, unit and inaccessible.

Non-porous materials, solid construction, no concealed or inaccessible corners, and light everywhere—are among the most important conditions for perfectly wholesome and sanitary town dwellings.

## RECENT EXCAVATIONS IN THE FORUM OF AUGUSTUS.

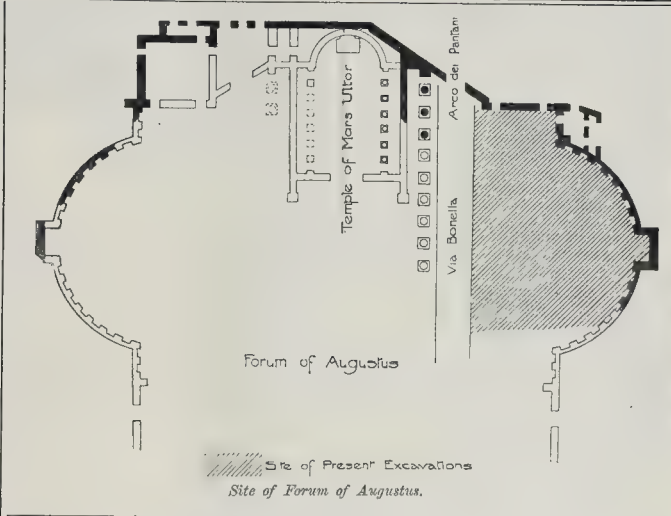
**I**N the month of February last the Municipality of Rome began the demolition of the small houses, of the granaries, and of the shops supported by the wall of the Forum of Augustus, with the intention of removing that mass of buildings, and of discovering the ancient plan of the Forum, where most probably many interesting relics still exist in the shape of monuments in honour of distinguished Romans.

The area in which the new excavations have been commenced is contiguous to the north with the Via Bonella, and with the temple of Mars Ultor; at the east and south with the semicircle formed by the perimeter wall of the Forum, and at the west with the modern buildings of the Via Bonella. Augustus followed the example of Caesar, and, in continuation of the Roman forum and Caesar's forum, built a third one, still more magnificent, named *Forum Augustum*, or afterwards the *Forum Martis*, from the Temple of Mars Ultor, which stood in the middle of it. The reason given by Augustus himself for this work was the absolute insufficiency of the two previous forums for the transaction of business and the administration of justice. The spot where the Forum and the Temple stood was encumbered before with private houses of the Republican period, and the expropriation of a great number of those buildings, besides necessitating a considerable expense, would have been somewhat high-handed action on the part of Augustus towards his fellow-citizens, as Suetonius, "Aug." 66, says:—"Forum Augustus scit, non ausus extorquere possessoribus omnes," &c. This is confirmed by the irregularity of the boundary wall, which was built so as to conceal the neighbouring buildings, which were so much more offensive to the view, as they were constructed on the rapid slopes of the Quirinal hill.

The wall of the Forum is built with large sperino blocks, united by wooden dowels. The arches of this wall, the large cornice that winds round it, and the ornament by which it is finished above, are built of travertine marble. The Forum was dedicated in 2 B.C., and on this occasion magnificent games and shows took place. The principal monuments that adorned the Forum were, besides the above-mentioned temple, the porticoes, the triumphal arches, the *quadrigæ*, and the statues erected in honour of illustrious Romans. The porticoes followed the direction of the perimeter wall, and we learn from the sixteenth century architects that the columns were of different kinds of marble.

The triumphal arches in honour of Germanicus and Drusus were by the side of the temple of Mars. The monument of Ancyra was the only truthful authority that mentions the *quadrigæ* dedicated to Augustus in this forum.

The present excavations are, as I have said, being executed in the southern semicircle of the Forum. The materials which have filled up the ancient level consist chiefly of marl, with a few fragments of old building material. This layer of earth was carried here under the pontificate of Pius V., and in 1570 by the "maestro della strada, Prospero Soccapaduli," in order to drain the waters that filtered through the soil, and those that, ascending from the Quirinal and Esquiline hills, formed stagnant pools in this spot. The ancient level of the Forum has been found at the depth of 6 metres, and the original pavement, composed of various qualities of



marble (such as "giallo antico," red and grey granite, "verde antico," porphyry, and serpentine marbles), forming in the whole a geometrical figure, has also been discovered in a perfect state of preservation. At this level, part of a fluted column of "giallo antico" has been found, 4 metres long, and 1 metre in diameter, which, I believe, formed part of the internal decoration of the Temple of Mars Ultor. A fragment of the marble cornice of the same temple has also been discovered, besides the base of a marble column. A large Corinthian capital has lately been dug out. It formed part of the outer row of columns belonging to the temple, of which only three are still standing in their places. Beneath the porticoes of the Forum were the honorary pedestals, designed to bear the statues of victorious generals; the number of these pedestals was, I think, very great. Thirty-six of these bases are known positively, having been mentioned by authors; but the number may represent only a fifth, or even a tenth, part of the total.

One of these bases has been found lately. It is 1.05 metres high and .39 metres in width, and bears the following inscription:—

DIVO NIGRINIANO NEPOTI CARI GEMINIS FESTVS  
V . . . . RATIONALIS.

From this inscription we learn that Nigrinianus was the nephew of Carus, who died young, in A.D. 283. Geminus Festus, who dedicated the pedestal, continued to exercise his office of *rationalis* (procurator) under the Emperor Maximianus. It seldom happens that documents of such historical importance as the inscription of Nigrinianus are met with in the urban excavations. Near this pedestal another one was found, .47 metres high and .39 metres in width, with the following inscription:—

IMP. CAESARI AVGVSTO P.P. HISPANIA VLTIOR  
BAETICA QVOD BENEFICIO EIVS ET PERPETVA CVRA  
PROVINCIA PACATA EST. 62. (1) AVRI P. C.

The pedestal must have upheld an object, which Prof. Lanciani, director of these excavations, supposes to have been a beautiful vase, which, as we learn from the inscription, was of solid gold, and weighed one hundred pounds.

A third fragment of an inscription mentioned the career of an *eques Romanus*, who had attained the dignity of governor of Egypt.

These are the discoveries that have lately taken place in the semicircle of the Forum of Augustus, and doubtless when the soil has been completely removed we may expect further important discoveries, both of architectural remains and inscriptions.

I am glad to be able to close the present account with the news that the Roman Muni-

cipality is, at present, thinking of buying the nunnery, which was built in the sixteenth century over the northern part of the Forum, and above the Temple of Mars, so as to pull down the said building, and to excavate the entire Forum of Augustus. The remains of the arch, known by the modern name of the "Arco dei Pantani," at the end of via Bonella, are in themselves sufficient to indicate the high class of architectural work which formerly existed on this site. L. B.

## PATENTS.

**I** recently noticed the publication of a supplement to Carpmael's "Patent Laws of the World,"\* and we stated that the parent work and the supplement were each invaluable to persons whose business was connected with patents. But the publication of the supplement is of noticeable importance in another respect, for it seems to show the urgent need for an international code of patent law. Patents are, to a certain extent, international in their character. A piece of mechanism of which a man is the inventor may be of use in all parts of the world, and the inventor requires protection as much in America as in Europe. There already exist statutes and Orders in Council for the purpose of international copyright, though it is obvious that the difference of language and of national characteristics makes copyright in literary works less an international matter than patents for inventions. Again, it is worth while to bear in mind that there now exists an international code of rules for regulating the traffic on the ocean, and it is clear that nations are approaching each other in regard to an international postal system. So it seems to be within reason to desire the promulgation of an international code of patent laws.

Already many of the differences in existing laws are but slight. Take, for example, the term of years for which a patent is in existence. In Great Britain it is fourteen years; in France it is five, ten, or fifteen years; in Germany it is fifteen years, and in the United States it is seventeen years. Thus it will be noticed that there is only three years difference between the highest and the lowest full term. But even if at present the time has not arrived for an international patent law, it is difficult to see why, in theory, there should be differences between the patent laws of the British colonies. In Canada, for example, the term for which a patent can be granted is fifteen years, in New Zealand it is fourteen years.

\* "Patent Laws of the World." By A. Carpmael, Solicitor, and E. Carpmael, Patent Agent, London; W. Clowes & Sons. 1886.



Again, there is a curious disparity between the law of Canada and the law of the mother-country in another respect. A patentee in Canada pays a fee for the full term of fifteen years, or a lesser and partial fee, which practically gives him a patent for five years or ten years, according to the sum paid. If, for example, the fee of 20 dols. is paid for a five years' term, and the further fee is not paid at the end of that time, then the patent lapses. But in Great Britain 50*l.* has to be paid before the end of four years from the date of the patent, and £100 before the end of eight years from the date of the patent, or there may be a graduated fee beginning at the end of the fourth year, and going on to the thirteenth year. The discrepancies between Great Britain and Canada on this point are, therefore, very notable. The reasons for these are not equally obvious; if there is to be a separate law for each colony and for the mother country, it should be made as nearly as possible the same in every particular. But, having regard to the facility of modern commercial intercourse, it would be more desirable that there should be one law for the whole of Great Britain and her colonies, so that a person who obtained a patent in Canada would have, without more ado, a valid patent in all the dominions of the Queen, and the man who had patented an invention in England would be protected in Australia or in Canada. The issue of a patent in London would be registered not only in England, but in the several registries of the colonies and dependencies of the Crown.

There are also obvious advantages in an international system of patent laws, for it would tend to simplify and make clearer the existing English law on the subject. For example, in this country the person who is entitled to obtain a patent must be in possession of an invention of which he claims to be "the true and first inventor." But there is here no definition of an invention. If we turn to the French law we find that "the following shall be considered as new inventions or discoveries:—1. The invention of new industrial products, the invention of new methods, or the new application of known products for obtaining an industrial result or product." We do not say that this is altogether a satisfactory definition, but at any rate, it gives a person some kind of guide as to the subject-matter of a patent, more especially when read in connexion with Article 3 of the same law. Again, in Germany the law of 1877 definitely states that "patents are granted for new inventions which can be turned to account in trade." It also gives a definition of a non-patentable invention, from which, of course, it is possible to infer what a patentable invention is. Article 2 runs thus:—"An invention is not regarded as new if it has already been described in any printed publication, or publicly used in Germany at the time of application for a patent in accordance with this law, in such a manner that its employment appears possible by other persons skilled in the particular trade to which it relates." The difference between English and German practice is best shown by an example. In England two persons may almost simultaneously have hit upon an invention. Each may claim to be the true and first inventor. Whether the one who may be the latest in making the discovery has described it in a printed publication makes no difference. But in Germany, if the one who seeks to obtain the patent has not previously described the invention in some publication, and the other has done so, then the person who is seeking to obtain the patent cannot obtain it.

It would be impossible within reasonable space to enter at greater length into this subject; but there is one point of some practical interest, viz., that part of the law which makes the Attorney-General, overburdened as he is with official and private practice, a kind of appeal court from the Comptroller. If, for example, the latter requires what is, in the opinion of the applicant for a patent, an unreasonable amendment of the specification, the applicant may appeal to the Attorney-General.

Often the Attorney-General has no special knowledge of patent law, the present holder of that office being, however, a remarkable exception. The question must, therefore, very soon arise whether the appeal from the Comptroller should not be to a permanent official possessing special knowledge of patents.

#### NOTES.

**T**HE London County Council is now beginning to get a grasp of the work it has been appointed to carry out; but although it sat for nearly six hours on Tuesday, it failed to dispose of a quarter of the items on its agenda, owing mainly to the large number of reports of Committees which were presented. The report which occupied the most time was that of the Finance Committee, whose Chairman, Lord Lingen, introduced the estimates of the receipts and expenditure of the Council for the year ending March 31, 1890. The net sum required to be raised, after taking into account the sums receivable from the Exchequer in respect of the performance of duties the cost of which has not hitherto been defrayed directly out of the Metropolitan rates, is 1,618,655*l.* This will mean a rate of 12*5*/<sub>32</sub>d. in the pound per annum over the whole of London, except the City, which will pay only 10*6*/<sub>32</sub>d. in the pound,—due to the fact that the City of London bears the cost of its own asylums, industrial schools, coroners, &c. The rate is 4*d.* in the pound higher than the rate last year, but the abolition of the Coal and Wine Dues is responsible for 2*d.* or 3*d.* in the pound of this increase. The sum required is to be levied on the various parishes in two instalments,—seven-twelfths, or 944,215*l.* 8*s.* 4*d.*, being called for in the first six months, and the remaining five-twelfths, or 674,439*l.* 11*s.* 8*d.*, being required in the second six months. This inequality in the amounts payable in the two halves of the year was explained to be due to the fact that the Exchequer contributions will not be paid in to the funds of the County Council until the second half of the year, although the County Council will previously have to meet part of the expenditure in respect of which such contributions are to be made. The inequality of collection is likely to press hardly upon many people, for whereas the rate for the first six months will be 7*3*/<sub>32</sub>d. in the pound over London at large, and in the City 6*20*/<sub>32</sub>d. in the pound, in the second half-year the rate will be 5*22*/<sub>32</sub>d. in the pound outside the City, and 4*43*/<sub>32</sub>d. within the City. The total rateable value of the County of London is 31,586,561*l.*, or 27,706,948*l.* exclusive of the City. The rateable value of three parishes outside the county of London (viz., Hornsey, South Hornsey, and Beckenham) assessable to the main drainage portion of the London County Council's annual expenditure, is 426,504*l.* We cannot analyse the Council's budget in detail, but there are some items in it which are rather vague,—notably 140,012*l.* "charges transferred from the Counties of Middlesex, Surrey, and Kent," under Section 41 of the Act. This estimate, it is stated, "has been prepared in conference with the Treasurers of the Counties." It cannot be given in detail, and is subject to alteration when the adjustment of account takes place between the Counties of Middlesex, Surrey, and Kent. Another item needing elucidation is that of 13,713*l.*, "costs incurred in the election of County Councillors in January, 1889, by the Returning Officer." There were 118 councillors so elected, so that the Returning Officer's charges amounted to a fraction over 116*l.* per member, or 332*l.* per pair of members in each of the fifty-seven districts outside the City, and 464*l.* for the four members who sit for the City.

**T**HE new rooms on the west side of Westminster Hall are now nearly completed, and it is to be hoped, as Mr. Plunket promised in reply to a question of Mr. Cavendish Bentinck's the other night, that the public will not much longer be shut out of West-

minster Hall. Mr. Cavendish Bentinck's question, why the centre staircase to the new rooms was not made opposite the members' door on the east side of the Hall, was perhaps hardly called for. A Gothic hall does not demand the kind of symmetry which the question would imply, and the centre of the range of rooms was undoubtedly practically the best position for the staircase. The appearance of the two staircases, one at the north end and the other in the centre of the west side of the Hall, is to our mind ridiculous, considering the paltry nature of the accommodation to which they give access, and there can be no doubt that the stairs are most injurious to the appearance of the hall, nor is their design and detail such as to make them very interesting objects in themselves. The rooms between the buttresses make pretty rooms enough, and are being finished in a picturesque manner; though the appearance of the flying buttresses coming through the ceiling is even worse, and more absurd inside than the external appearance of the buttresses diving into the roof. The centre staircase gives access to a small vestibule out of which the first two "committee-rooms" open right and left; but beyond this the rooms open one out of another, and hence a staircase is necessary also at each end of the hall to gain access to the end rooms, and prevent the others being really passage-rooms, which in appearance they are still. The formation of these three stairs, two of them of very large proportions, to give access to such a poor set of small rooms, is one of the prominent absurdities of the scheme. It has been pretended that the stairs only represent stairs that were there originally, but this can surely only refer to the stairs of the northern end, and those, in Medieval times, would be behind a screen. A member of the House who took us over (and who had no architectural "opinions") observed that they would be very unsuitable as Committee-rooms, but they might form an agreeable and welcome addition to the smoking-room accommodation of the House, if relegated to that purpose. Both in an architectural and in a practical sense the result is as absurdity, a mere archaeological whim carried out at inordinate expense and in direct opposition to the true spirit of architecture in the proper sense of the term.

**W**E are glad to see, from the last number of the "American Journal of Archaeology" for December, 1888, that this very deserving periodical has been made the official organ of the American School of Classical Studies at Athens. By this we suppose is meant that the "Transactions" of the School, which have hitherto appeared at very irregular intervals and with prodigious delay, will now cease, and the whole material of the discoveries made by the School will be incorporated in the Journal. This will be a double gain; we shall have one archaeological publication the less, and we may hope for a somewhat speedier report of excavations than has hitherto been the case. Further, the "Journal of Archaeology" will itself be distinctly a gainer. It has always been noted for full and excellent *résumés* of periodicals and archaeological news; but subscribers were beginning to feel that it might with advantage spend a little less space on *résumés* of other people's work, and a little more on original research. In the last issue, for example, out of 137 pages, ninety-four are devoted to *résumés* and news, leaving only forty-three for original articles! As these are devoted to a wide field, which embraces prehistoric art and Medieval antiquities, it may be imagined the original articles on Classical antiquities were not excessive in length or number. Now it is hoped a new system will be adopted. The *résumés* will be continued, but a series of most interesting original papers are promised. The results of the excavations carried on during the last two years at Thoric, Sikyon, and Ikaría will appear. Dr. Chas. Waldstein will publish the recently-discovered head of Iris from the Parthenon frieze, which he was the



first to identify; and Dr. Hartwig is to contribute an important article on signed vases. We wish the new coalition every success.

THE number of *L'Architecture* for March 23rd contains an article on "Les Orgues Electro-Pneumatiques," with some illustrations, which we commend to the notice of those sceptical architects who cannot believe that an organ can be conveniently played in modern days by a long movement placing the player at a distance from the instrument. The article is in the first place *apropos* of the installation of the organ or organs in the Church of Ste. Clothilde at Paris. The keyboard here is placed in the choir stalls, the pipes above the choir-screen. A further application of the system has just been made in the Church of St. Jacques-du-Haut-Pas, at Paris. Here the organist playing on the keyboard of the Choir Organ in the choir can also actuate the two large organs on the tribune, alternately or simultaneously, or the organist placed at the key-board in the tribune can play the organ in the choir. "Il y aurait trois ou quatre claviers et trois ou quatre orgues, au lieu de deux, que l'organiste posséderait, de l'un quelconque des claviers, le moyen de commander à tous les instruments, à sa guise." The electrical power is furnished in this case by eight Lalande batteries, five for the tribune organs and three for the Choir organs. The expense of maintenance is insignificant. The article concludes with the following comment:—

"L'Exposition universelle nous fournira vraisemblablement l'occasion de parler de nouveau des orgues électro-pneumatiques, car il s'y prépare une remarquable installation de ces grandioses instruments."

Les physiciens nous donneront alors l'explication de curieux phénomènes qui nous sont signalés d'attraction, de sympathie, si l'on peut s'exprimer ainsi, se produisant entre les ondes sonores provenant de deux orgues séparés par une assez longue distance et mus simultanément par l'électricité."

AMONG the miscellaneous matters coming up for consideration at the meeting of the London County Council on Tuesday was a recommendation, contained in the report of the Sanitary and Special Purposes Committee, that a Medical Officer of Health for the Metropolis be appointed, at a salary of 1,250*l.* per annum. It was explained that the duties of the officer to be so appointed would be "to inquire into any matter affecting the public health of any district as to which any report is sent to the Council in pursuance of Section 19 of the Local Government Act, and to report thereon;" and to perform such other duties in connexion with the public health of London as the Council might from time to time direct. It was further mentioned that the holder of the office would not be allowed to take private practice; that all fees paid for his services should go into the funds of the County Council; and that he would not be entitled to a pension. After a long discussion, it was decided to make the salary of the office 1,000*l.* per annum instead of 1,250*l.* Mr. William Saunders, Mr. John Burns, and other ardent "economists," talked a great deal of nonsense on this question.—Mr. Saunders remarking that 500*l.* a year was quite enough salary to pay to a man who would only be "a sort of glorified sanitary inspector," and who would have to supervise the work of the sanitary inspectors of the metropolis. Mr. Saunders seems to have read the Local Government Act very imperfectly if he has formed this conception of the *role* of a Medical Officer of Health to a County Council, and if he does not perceive that County Councils are intended to pay adequate regard to sanitation. Some members of the late Metropolitan Board of Works, we know, used frequently to defend the Board's remissness in sanitary matters by publicly declaring that the Board was not a Sanitary Authority; but the Board has passed away, and with it, we hope, much of its short-sightedness. Its successors, the County Council, want a skilled hygienist,—a man of initiative and resource,—to advise them on

many important matters as to which the late Board had either to call in specialists or to act on the opinion, second-hand as it were, of the officer of some other body; and the sum they have voted for this object is the least that could be offered, if the services of a man really adequate for so important a post are to be secured.

THE collection of miniatures at the Burlington Club is of the highest interest, but it is a mixed interest, by no means artistic purely, or even in the first instance; for if these were the miniature portraits of unknown persons, few would care much to visit the exhibition. The historical interest of seeing so many presumably faithful likenesses of personages well-known in social and political history, within so small a compass, can hardly, however, be exaggerated. The likenesses are probably more trustworthy on the whole than those afforded by easel portraits on the ordinary scale, as they were mostly made as memorials for friends of the person represented, and the first object was fidelity in regard both to features and costume; and the artists who pursued this branch of portrait-painting were people who were mostly content with this realistic view of their art, and were not led astray from actual truthfulness by the desire to produce striking effects. In an artistic point of view the interest of work of this class is of course much more open to question,—most miniatures are as hard as can be in style; those, however, of the best masters of the art show often great power of modelling and of expression on a small scale, and great finish in the painting of accessories. Petitot and Isabeau in France, and Samuel Cooper in England, might claim to rank among the eminent portrait-painters. The preface to the catalogue quotes a remark of Walpole's that if Cooper's miniatures were magnified to the size of Vandyck's portraits, they would appear as if painted for the larger scale: and one example of Cooper's in the Burlington collection, the portrait of Lady Catharine Howard (No. 2, Case XI.), seated in a blue dress and with her hand on a globe by her side, has really all the sumptuous and grandiose style of a Vandyck, and is exquisitely finished besides. The Club has secured a real curiosity in the ancient miniature credited to the third century (Case III., No. 45) representing a half length of a mother with her child in her arms. The catalogue preface (signed "J. L. P.") says this remarkable example was originally found by Ficoroni in the ruins of Tivoli; it eventually found its way into Walpole's collection, and was bought at a sale at Strawberry Hill by Mr. Wentworth Dilke, in 1842:—

"It consists of two layers of glass cemented together, and the circular border of the glass is entire, so that it does not appear to have been the bottom of a patera, as has been supposed, but to have been complete in itself as a miniature portrait. The lower piece of glass is throughout of a deep blue colour. The upper layer is of the same deep blue, except where we observe a circle of gold near the border and the figures of mother and child. These portions appear to consist of colourless glass. Thus the figures painted on the under surface of this upper layer of glass are seen as we look down on it, and the under layer has preserved the painting from injury, so that it is probably as fresh now as when it came (1,600 years ago) from the hand of the artist."

It was intended that the collection should be arranged chronologically, as we have often said such collections at the Burlington Club ought to be, but the objection of the owners to the breaking up of their collections militated against this: they are therefore grouped according to owners. Among some that we noted as of special interest are "Pamela, Lady Fitzgerald" (Case I., 37), by Maris; "Sir Philip Sidney" (III., 41), no artist's name, a beautifully-executed and most-characteristic head; "Head" ascribed to Holbein (III., 43), and we should say undoubtedly his; the whole collection in Case VIII., French portraits, including works by Isabeau and Parent, and a portrait of Isabeau herself, and a remarkable portrait of Napoléon in coronation robes; a miniature of the grand head of "Mrs. Siddons" (X., 6); "David

Garrick as Kitey" (XIX., 3); an unfinished portrait of "Cromwell," by S. Cooper (XXIII., 1); a profile portrait of Francis I. (Frame 25); one of Napoléon, by Isabeau (Frame 26), painted at Berlin, where Isabeau was summoned for the purpose, and sent to Josephine (whose own portrait appears several times in the collection); "Sir N. Poyntz" (XXIX., 6), attributed to Holbein, a most interesting profile half-length of a face of much character, and a beautifully-painted embroidered costume; and an exquisite little cameo of Napoléon by Morelli (XXXII., 71), artistically one of the most remarkable things in the collection; this was given by Madame Mère to Dr. O'Meara, whose vindication of Napoléon as against Sir Hudson Lowe has just been republished. These are merely a few items from a collection the historical interest of which, at all events, is almost endless.

THE collection of "Water-colour Drawings on the Thames" by Mr. F. G. Cole-ridge, now on view at the Fine Art Society's rooms in New Bond-street, consists of a series of rather too "pretty" sketches mostly in the neighbourhood of Sonning, with a few about Henley and Wargrave. They form tolerably truthful representations of scenes in that part of the river, but their artistic interest is not very high.

WE have frequently commented on the remissness of Metropolitan parishes in the matter of the provision of public baths and laundries, and we are therefore glad to see that the matter is being taken up by the London County Council, at whose meeting on Tuesday last the following resolution was agreed to, on the motion of Mr. Phillips:—

"That in the opinion of this Council it should be invested with powers to establish public baths and laundries in all parts of London, and that the matter be referred to the Sanitary Committee to consider and report."

Mr. Phillips very rightly said that the neglect of the Metropolitan parishes in this matter was far from creditable, although such opportunity for neglect was afforded by the permissive nature of the Act of 1846. Since that Act was passed, it appears that only twelve or thirteen of the fifty or more parishes of the metropolis have adopted its provisions. The parish of St. Pancras is honourably distinguished in this matter by the possession of two separate sets of baths and washhouses in different parts of the parish; but other equally populous parishes, such as Bethnal Green, Clerkenwell, Shore-ditch, and St. George-the-Martyr, Southwark, are without any such aids to health and cleanliness, notwithstanding what seems to be the established fact that under proper management such establishments pay their expenses, or very nearly so. Probably if the whole of these establishments were placed under one control the present expenses of management would be materially reduced, for at present, as was pointed out by Mr. Eccleston Gibb, each parish which has adopted the Act has to have its own set of "Commissioners of Baths," its own Clerk and other officers, its own corporate seal, and other paraphernalia of office, each separate parish adopting the Act thus having to bear separate "establishment" charges which ought to be materially reduced by concentration. The need of public washhouses in populous and poor neighbourhoods was forcibly illustrated by Mr. Phillips when he said that "if you want to find the very lowest depths of human misery, you must go into a one-room tenement on a washing-day."

**The Fall of a Building in Great Titchfield-street.**—The Carpenters' Company have generously forwarded ten guineas to the general committee, meeting at the Polytechnic Institution, Regent-street, for the relief of the widows and orphans of the men who lost their lives in the Great Titchfield-street disaster. Contributions have also been received from several architects. A list of subscribers will be published shortly. Mr. H. W. Richards is the hon. sec.





FRONT VIEW.



OCEAN FRONT.

*American Domestic Architecture.—House at Seabright, New Jersey, U.S.A.—Mr. Bruce Price, Architect.*

#### AMERICAN DOMESTIC ARCHITECTURE.

We give two views and three interior sketches of a house at Seabright, New Jersey, designed by Mr. Bruce Price, architect, of New York. A feature in the exterior design is the introduction of an open loggia in the ground story.

The lower portion of the walls is in Haverstraw brick set in red mortar, with dressings of Carlisle stone. The upper part of walls and the roof are covered with Akron tiles.

The interior is mostly finished in oak and red wood. The hall and dining-room have carved mantel-pieces of Carlisle stone.

#### CELTIC ORNAMENT ON THE CROSSES OF CORNWALL.

BY MR. ARTHUR G. LANGDON.

A PAPER on this subject was read on Wednesday, the 6th inst., at the rooms of the British Archaeological Association, being supplementary to a previous paper prepared in conjunction with Mr. J. R. Allen, and read last year, which was illustrated by about 100 pen-and-ink drawings, made by the author to scale. The first paper, on "The Early Christian Monuments of Cornwall," gave a general account of the crosses and inscribed stones,

and showed that there were about thirty inscribed stones, and some 250 crosses of different varieties, and concluded with lists giving the "geographical distribution of the stones," and "classification, arranged according to the form of monument and shape of cross upon it," from the rudest to the most ornate,—a very useful list not previously attempted.

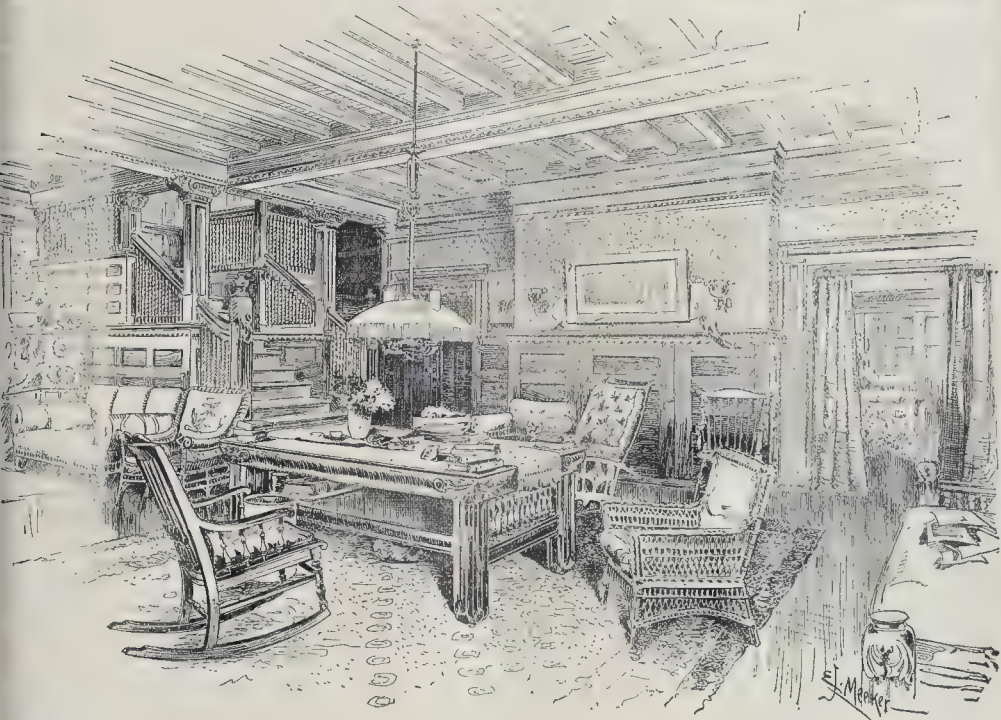
The present paper was accompanied by drawings of all crosses upon which Celtic ornament occurs, all drawn to scale, with the assistance of rubbings photographed.\*

\* A selection from Mr. Langdon's drawings of these crosses will be found in our lithograph illustrations of this week.





FIREPLACES IN PRINCIPAL SITTING-ROOMS.



HALL AND STAIRCASE.

*American Domestic Architecture.—House at Sealbright, New Jersey, U.S.A.*

In the previously published works containing engravings of these stones, the representations are most inaccurate, and the shapes of the letters on the inscribed stones very misleading. The author's drawings were compared with the engravings in Borlase, Tysons, and Blight, and various glaring errors pointed out in the latter; having thus shown the necessity for reliable drawings and information on the subject, Mr. Langdon said that, having now taken up the subject, he hoped in the course of time he would be able to produce a book on the crosses of his native county, treating the matter more

scientifically than his predecessors in the same line of inquiry.

Having given a list of the crosses with Celtic ornaments upon them, he described in detail all those which had inscriptions, viz., Lanherne and Tintagel in mixed minuscules and capitals; Cardynham and St. Cleer in minuscules only; adding, that of all the monuments in Cornwall the cross in Lanherne nunnery was the best-designed and most carefully executed example.

The uninscribed crosses were next taken, and full descriptions of those at Sancreed, St. Columb Major, and Phillack were given. He

then proceeded with some general remarks on interlaced work, and, quoting from Mr. Anderson ("Scotland in Early Christian Times"), said, "that this species of ornament is to be found in the works of art of most periods and of most nations." It was remarked that most of the ornament on the Cornish crosses is badly designed and rudely executed; this was accounted for by the intractable nature of the granite with which the workmen had to deal. In support of this view he mentioned that the only cross which exhibited a better quality of art, viz., the cross at Lanherne, unlike the rest of the Cornish



crosses, was made from a more easily-worked material.

The majority of the patterns, he said, were evidently debased copies of those beautiful forms found in Ireland and Scotland, where Celtic ornament was carried to its highest state of perfection. Two of the most typically Celtic forms of ornament were found in Cornwall, viz., interlaced work and key-patterns; but of the true Irish divergent spiral there were no examples, as the scroll-work which occurs on some of the stones appears to be more in common with the foliage in Northumbria.

The author gave, in conclusion, an analysis of the ornament on the crosses, arranged as follows:—(1) Plaits, (2) broken plaits, (3) irregular plaits, (4) irregular broken plaits, (5) debased forms of plait-work, (6) knots occurring in plait-work, (7) ring-patterns, (8) knots, (9) key-patterns, and (10) scrolls. With regard to the above, he remarked that, thanks to a most valuable paper by Mr. J. Romilly Allen on the "Analysis of Celtic Ornament," in the Proc. Soc. Ant. Scot., he was enabled to compare the work of Cornwall with that of other districts in Great Britain.

Such an analysis of the ornamental features of the early sculptured stones, if carried out for every county in England on a similar plan adopted by the author for Cornwall, might be the means of throwing much light on the age of these monuments, a subject upon which there was at present a great divergence of opinion.

#### THE FLORAL BADGES OF OLD ENGLAND.

ENGLISH heraldry is indebted to the vegetable kingdom for some of its most historic and interesting badges and bearings.

The *planta genista*, or broom-plant, as the emblem of a long and kingly line, is for ever interwoven in our national annals. It was first assumed by Geoffrey Plantagenet, Count of Anjou, the founder of the race and the father of Henry II. The motive for its adoption is involved in some obscurity, but religious sentiment is generally understood to have been the cause.

We learn from Lower that it was first worn as a token of humility and penance, in expiation of a great crime by an ancestor who went on a pilgrimage to Jerusalem with a sprig of the plant in his cap. The same authority tells us that the English family of Broome is descended from this princely stock, according to tradition.

Anderson, in his book on Surnames, records that the assumption of the broom plant was the result of a murder, and that the criminal set out to the Holy Sepulchre accompanied by two servants,—one to lead him by a halter to the place of correction, and the other to strip and whip him there with this tough and pliable rod, which was well suited for the purpose, and to be met with in Palestine.

Louis IX. of France, on his marriage with Margaret of Provence, instituted the Order of the Broom-flower, with the motto "Exultat Humiles."

At Westminster the robe of the effigy of Richard II. is diapered with *Planta Genistas*.

By the irony of fate, this emblem of humility was borne by the proudest house that ever occupied a throne. On the death of Richard II., the rival races of York and Lancaster came to the front, and from thence, "the rose, sweet and fair, is England's chosen tree,"—a flower, according to Armiologia (or the language of arms),—signifying mercy and justice, but which will always be associated with the most tragical and bloodthirsty chapter in our history.

As an illustration of the bitter party spirit that was created by the Wars of the Roses, we may mention a fanciful legend of the Shirley family, who were such firm adherents to the Lancastrian cause that it is said to this day that the white rose never flourishes on their ancestral estate at Ettington, in Warwickshire. The late Mr. Tom Burgess alludes to it in his work on that county, and the story has been told in verse by a celebrated descendant of the ancient house.

It is a disputed point as to when the rose was first used in the heraldry of England. Planché is of opinion that we owe it to Eleanor of Provence, the mother of our Edward I. It is also a question how the red rose came to be adopted by the Lancastrians and the white one by the Yorkists. As a national badge it first appears upon the great seal of Edward IV., who was known as "the Rose of Rouen," from

that being the place of his birth, and also on account of his own good looks.

The Yorkist rose is sometimes represented as surrounded with the rays of the sun, and then it is known in heraldic language as a "rose en soleil."

In Tewkesbury Abbey Church lies the last of the Lancastrians, the son of Henry VI. and Margaret of Anjou, with the rose of his race depicted on his tomb. We may just add that Margaret adopted the daisy as a device, and in allusion to her name, and thus the "wee modest crimson-tipped flower" of Burns becomes associated with the Wars of the Roses.

It was no unusual thing for men to change sides during this period, and to change the roses on their shields at the same time. We may instance the Lowers of Sussex as an example.

Cornish families took a prominent part in these conflicts, and this accounts for the many coats of arms from Cornwall being charged with roses.

When Henry VII. ascended the throne the rival flowers were united, and borne red and white combined, and known as the Tudor rose.

The Stuart Kings adopted a rose and thistle, crowned; and afterwards the white rose alone became the emblem of this most unfortunate family.

Thus for fully four centuries has the rose been used as the badge of England, and become inseparably connected with our national life. Even as the sign of a public-house "The Rose and Crown" holds its own.

The hawthorn bush, another badge of the Tudor dynasty, owes its origin to the Battle of Bosworth, when, according to common tradition, the Crown of England was found after the fight hidden under a hawthorn bush.

In the Somerset Chapel, Windsor, is a falcon with the head of a maiden holding a white rose, one of the badges adopted by Richard III.

Katharine of Arragon, the first wife of Henry VIII., used as a badge the pomegranate, burst open, in conjunction with a red and white rose.

Queen Elizabeth's motto, used in connexion with the rose, is *Rosa sine spina*, or a rose without a thorn.

The fleur-de-lys was one of the badges adopted by the Stuarts, but whether this well-known French device represents a flower or not is rather a moot point. Whole books have been written upon it, but the solution has never been found.

Scotland's barbed thistle is said to have been introduced by James III. as the national badge of Scotland in the latter half of the fifteenth century, in allusion to the Royal motto of "In defense"; but another tradition claims for it a much earlier date, going back to the Danes, who, trying to surprise a Scottish camp in the night, were frustrated by one of their men treading upon a thistle, and arousing the defenders by his involuntary cry of pain.

The shamrock of Ireland dates from the fifth century, as the emblem of St. Patrick, who used its three leaves conjoined in illustrating the doctrine of the Trinity. The Irish claim for the badge that it flourishes everywhere, while the rose and the thistle require warmth and sunshine.

The leek (Wales's national badge) is worn in commemoration of a conquest of the Saxons on St. David's Day (March 1st), in the sixth century, under King Cadwallader.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS:

LAYING OUT STREETS FOR CONVENIENCE OF TRAFFIC AND ARCHITECTURAL EFFECT.

THE eighth ordinary meeting of the Royal Institute of British Architects for the present session was held on Monday evening last, Mr. Alfred Waterhouse, R.A. (President), in the chair.

*The Examination in Architecture.*

Mr. W. H. White (Secretary) announced that at an Examination held during the week commencing Feb. 25, 1889, and at an Examination held during the week commencing the 18th inst., 51 candidates had passed, and were qualified to become candidates for the Associateship, viz.—Francis Baugh Andrews (Birmingham), Thomas Dinham Atkinson (Cambridge), John Reginald Best, David Bird (Sale, Cheshire), Arthur Body (Plymouth), James Barritt Broadbent (Man-

chester), Allen Ovenden Collard, Charles Herbert Cooper, Egbert Augustine Crooke (Crewe), Robert Edmund Crossland, Reginald Alwyn Crowley (Alton, Hants), Edward Guy Dawber (Moreton-in-Marsh), Langton Dennis, Frederick William Dorman (Northampton), Frank Minshall Elgood, Thomas Bradford Ellison, Sydney Macfield Hairie (Manchester), Banister Flight Fletcher, Percy Christian Gibbs, Henry Langton Goddard, B.A. Oxon (Leicester), Edgar Augustine Hawkins, Robert Henry (Horsforth, near Leeds), Thomas Rowland Hooper, Edward William Hudson, Herbert George Iberson, Arthur Spottiswood Jones, George Kenyon, Henry Francis Kerr (Edinburgh), Herbert John Philip Kimpton, Robert Falconer Macdonald, George Orrell (Chorley), Francis Fitzaldell Perse (Loughrea, Ireland), Herbert Read, Henry Ross (Accrington), Frederick Moore Simpson, Ravenscroft Elsey Smith, Bertram Norman Southall, John Clark Strassman, William Henry Stucké, Walter John Tapper, Frederick Henry Tulloch, Frank Thomas Verity, Samuel Edward Wall, Richard Henry Weymouth, Herbert Lingard Whitley, Edgar Thomas Ainger Wigram, B.A. Cantab., Arthur Nesbitt Williams, Edmund Walter Wimperis, Gilbert Wood (Portsmouth), Benjamin Woollard, and Lawrence Youngs.

The President said that it was very gratifying to have so long a list of gentlemen who had passed the Examination (applause).

Mr. J. J. Stevenson, F.S.A., then read a paper entitled, "The Planning of Streets for Convenience and Architectural Effect." Mr. Stevenson began by referring to the change in the aspect of cities and towns consequent upon the march of improvement,—which improvement, however, had not been gained without loss. New towns and new streets had not the charm of old ones. Whether that was inevitable was worthy of consideration. The irregularity of the streets and the individuality of the buildings were two of the chief attractions in old towns. Streets were now widened and straightened; all were much alike, their sides flat straight walls with holes in them, around which were more or less trimmings; uniformity was the rule. In Baron Haussmann's improvements in Paris the dominant idea was the straight line. Paris was easier to go about in, and cleaner; but its interest was largely gone. It was the same in Rome. In Florence and Cairo the picturesque was degenerating into the dreary commonplace. In Australia and America the new wealth produced costly and handsome buildings, but rarely any artistic street views. At home the old tradition of picturesque street architecture survived and showed new development, but the streets had lost their old charm. Some of the causes were irremediable. Of late years, however, there had been a marked improvement in British street architecture,—the houses often possessing an individuality of their own. It was useless any one advocating the revival of the old system of styles, which should rather be developed and fitted to modern use. For the sake of making streets straight, building plots, which were best rectangular, were left any shape. Old buildings, valuable for their beauty and historic associations, were pulled down, when a slight alteration of the line might have saved them. Nature abhorred the straight line, and wherever art had been highest it had been avoided. Streets should look well to those using them, not merely on the paper plan; experience proved that departures from the straight line best attained this, as the High-street, Oxford; Grey-street, Newcastle; the Grand Canal of Venice, and other examples mentioned by the author, proved. Having referred to the charm of the front of St. Mark's, Venice, arising from the centre being set back, which the restorers were destroying by rebuilding the whole front on a straight line, Mr. Stevenson dealt with the reasons urged for and against making a street straight. It had been the idea of Imperial Rome; but the Roman spirit had not been artistic. Grandeur and admirable organisation characterised Roman rule, but also a singular defect of artistic development. The author then passed to the consideration of modern street planning as exhibited in the latest improvements, especially referring to those at Charing-cross, Piccadilly-circus, and Hyde Park-corner, which he condemned as inartistic, and which did not conduce to the convenience of traffic. The plan suggested by the Council of the Royal Institute was better in every way than the one carried out at Hyde Park-corner. The convenience of foot-passengers ought to be



the first consideration. The defects of the three above-mentioned improvements were dealt with in detail, the principles which appear to have guided the designers being stated, together with reasons for their being deemed erroneous. The working of Building Acts was shown to be another cause of the dull uniformity of modern towns, the limits prescribed by them becoming the rule. Restrictions should be as few as possible, and be limited to sanitation, safety, and sound building, and not trench on the art of architecture, which should have room for free expression and development. Examples were adduced in support of this opinion. The prohibition in Building Acts of projections beyond the wall surface or building line was one of the main causes of the monotony of streets, and should be removed, although the amount of surface projecting, and the extent forward of the projection, must necessarily be limited. A limit of 4 ft. for the latter would give all the freedom an architect needed. The portico of Hanover Chapel, Regent-street, gave the street an element of ancient grandeur, as did the portico of the theatre in Grey-street, Newcastle. Some restriction was necessary as to the heights of buildings. The existing restriction in the right of ancient lights acted, however, in a haphazard manner, and was not in force in France or Scotland. The question of its abolition was referred to by the author, who considered that injustice might be stopped for the future by a simple proviso that, when not already acquired, no rights of ancient lights should subsequently arise. A tower or spire might be carried higher without harm,—an absolute limit was therefore unadvisable, and tended to dead monotony. A restriction was needed which, while keeping down the general height, would allow portions to rise in the air, giving breaks and variety in the sky-line. The present laws produced in many places endless rows of mean, low houses, void of architectural beauty or interest, while there being nothing to cause circulation of the air, it became stagnant; this mode of building, therefore, was not healthy. The provision of the Building Act referring to a space at the rear of each building was commented upon as so drawn as to produce absurd results, and Mr. Stevenson considered it was not needed that all new streets should be required to be constructed for carriage traffic. The freedom and convenience of traffic was a fundamental public right which ought to be secured when vacant land was built upon. In London it had been singularly neglected, the Strand and Oxford-street being the only two continuous routes from the City westwards. Streets which, though open to traffic, led nowhere and were out of the line of it, were useless for general traffic. General power to run continuous routes for traffic across different estates which lie in the necessary line was needed, not despotic power over isolated estates. Proper provision being made of continuous streets for necessary lines of traffic, it was not necessary to make all other streets open to carriage traffic. The disposition in reformers and officials to make people do exactly as they thought right had one drawback: they themselves were not infallible. No restrictions should continue, still less be imposed, which could not show clear necessity and reason. It was the good fortune of architecture in London that the district surveyors, being practising architects first and not mere officials to enforce a law, possessed a higher authority and standing, and also, from their own experience, a wider and more practical view of the requirements of the law, than the official pure and simple. After alluding to the probability of new regulations arising from the institution of the County Councils, and the possible dangers attendant thereon, the author concluded his paper with the opinion that to make towns more interesting and beautiful; to make them a collection of buildings, each with its own individuality, and not mere lines of uniform straight streets without character and without sky-line; and to give a new aim in laying out streets, looking not to the beauty of the plan, which could never be seen actually, but to the effect of the elevations of the buildings, was surely a lustre worth striving for.

The President, in inviting discussion, said that they had been listening to a most opportune paper, coming, as it did, exactly at the time when the questions it dealt with were likely to command much more attention than hitherto, owing to the formation of the County

Councils. One of the burning questions of the hour was with respect to street effect, and the talked of loss of St. Mary-le-Strand—a church very dear to many of them. He had hoped Mr. Stevenson would have alluded to that subject, but it seemed, somehow or another, to have escaped his attention. The Council of the Institute had the question under its consideration, and intended to take action in the matter. The church was not only very beautiful in itself, but it had the advantage which few metropolitan buildings had, of being exactly in the right place (applause).

Mr. J. Macvicar Anderson (hon. sec.) said he attended a deputation on the preceding Thursday, along with the representative members of the Reparation Committee of the Church of St. Mary-le-Strand, to the Strand members of the London County Council for the purpose of protesting against any idea of removing the church. The deputation was listened to attentively by Mr. Augustus Harris and Capt. Probyn, and succeeded in eliciting from them the assurance that they had given no pledge in favour of the removal of the church (applause). The deputation further placed before those gentlemen facts in regard to the width of the Strand at various points, and of Fleet-street and other streets, and in reference to the architectural character of the church, which somewhat opened their eyes. For instance, the width of the street opposite the church—and he had paced it at that and other points—was thirteen and eleven paces. Further to the west, opposite the Adelphi Theatre, he found the Strand was ten paces wide, while opposite Bedford-street, Covent-garden, it was only nine paces wide. Opposite Norfolk-street it was eight paces, and in Fleet-street, opposite Anderson's Hotel, it was nine paces wide, so that they had a width opposite the church of thirteen and eleven paces, as against nine and ten paces westwards and eight and nine eastwards, showing beyond all dispute that the argument as to the church being an obstruction to the traffic was absolutely groundless (applause). The result of the deputation, he believed, was satisfactory, and if backed, as it would immediately be, by a strong letter from the Institute to the London County Council protesting against the removal, he believed it would have still further effect. He took it that the Council of the Institute would have the full sanction of the members in any action they might take in that direction (applause).

Mr. C. Forster Hayward, F.S.A., was pleased to hear what Mr. Anderson had just said because certain newspapers, which seemed to take a Philistine view of things generally, had been very urgent indeed in taking up this question of the removal of the Church of St. Mary-le-Strand. Its position was unique, for, as the President had said, it was exactly where it ought to be. They were all anxious that the Institute should take a position immediately in support of what Mr. Anderson had said, and he was only too glad to hear that the Council were about to move in the matter. In laying out new lines of streets, advantage should be taken of such monuments and architectural features as were worthy to remain, to enhance the beauty of the streets and improve the surroundings; and they should not pull down, disfigure, or destroy the valuable work of their forefathers, with the idea of increasing the value of the adjoining property. In making new streets, they must pass through a certain quantity of property, and in doing so it was seldom they would not come upon something or other worthy of being saved. No doubt there were streets which might be run through bad property, without meeting with anything worth preserving, but in making new streets the principles of which Mr. Stevenson had spoken, of the curved or non-monotonous street and the monotonous or straight street, must be taken together in a town. They could not lay down a rule that a curved street was the best, when occasionally a straight street was preferable. No doubt the traffic in the Strand would be very much improved by a double course of street. He knew an instance in his own town (Colchester) where there was a very fine street, similar, in a small way, to the Strand. This street formerly had a church in the middle, with two lines of traffic passing it. The people, however, got rid of the church, the result being that they had regretted doing so ever since, for, instead of

improving and making the street look finer, there was a monotony and want of something in it which they wished to supply to take the place of the church they had been foolish enough to pull down. It would be the same thing if the Church of St. Mary-le-Strand was removed (applause). The principle Mr. Stevenson had advocated, of having occasional differing widths, was extremely desirable to take into account. The Strand, at the end of Wellington-street, was terribly congested with traffic, but if there had been a circus there, or only a semi-circus towards Waterloo Bridge, it would have relieved the traffic very much. Then in a new street—Shaftesbury Avenue—there was a combination of straight lines and curves, which ought to have been more thought out, while, if the street had been differently laid out at the end towards Holborn, they would have had the Church of St. George, Bloomsbury, at the end, which would have had a very desirable effect. Instead of that the street had been simply spoilt because of a public-house and a distillery. Mr. Hayward concluded by moving a hearty vote of thanks to Mr. Stevenson.

Mr. E. C. Robins, F.S.A., inquired whether the Institute would consider the desirability of forming a road on the north side of the church of St. Mary-le-Strand as part of their suggested scheme?

The President replied that that would form part of the scheme.

Mr. Anderson added that the widening of the Strand was not necessary at that point, because the Strand was narrower at other points; but as part of the general improvement of the Strand, the proper way to do so would be to throw back the houses on the north side, leaving the church where it is.

Mr. Ralph Nevill, F.S.A., said that Mr. Stevenson's point as to the advantage of the crookedness of streets should be enforced on the public, who were now of an opposite opinion. Nobody who had observed the great beauty of many of the London streets could fail to recognise that it was greatly owing to their irregularity. For instance, the view coming up Fleet-street, with St. Dunstan's Church and the Law Courts beyond, was, under certain lights, unsurpassed in any European capital. Another good effect was also to be had in Bond-street, while the crooked bit by the church in High-street, Kensington, was very charming, though it had been threatened as being a scandal and disgrace to London. In fact, there were many well-meaning people who thought they were doing a great public duty when they tried to make the picturesque curved streets into nice straight thoroughfares. It was, therefore, most important that the attention of the public should be directed to the fact that a body of men existed, men who were not only artists but men of business, and who thought that some of the irregularities in the lines of the streets were an advantage instead of a drawback. He could not quite follow Mr. Stevenson's remarks as to its not being necessary to have carriage traffic in all roads. It was very nice, no doubt, to have paved by-ways for short cuts, but they could not forget the inconvenience which arose when coals had to be taken in or just had to be removed. He was sorry to understand from what had been said about the Church of St. Mary-le-Strand that the Council of the Institute did not propose to go a little further. It would be very desirable that the Institute should have the opportunity of offering some advice on the subject of the laying out of streets to the new County Council, who would, no doubt, be very anxious to signalise their reign by carrying out works of permanent utility. The large majority of the Council were pledged to find some means of increasing the accommodation for workmen. Therefore, if the Institute could, as it ought, help them by suggesting means by which they could make great improvements in London, and at the same time meet the claim for providing increased accommodation for the working-classes, they would very much help and strengthen the County Council, who would probably be grateful for any such support (applause). It was very important to bear in mind the extreme undesirability of carrying out such great improvements by little bits, instead of having large schemes, so that the improvements might repay the public and become profitable investments (applause). There was a strong feeling on both political sides that any such schemes should receive more attention than they had done in the past, especially as they had seen the unifor-

\* The fact seems to be, that many people have an exaggerated idea as to the narrowness of the Strand roadway flanking St. Mary's Church, because they compare it with the very wide roadway immediately westward of the church.—Ed.



fortunate results arrived at in the case of the Piccadilly Circus and the Shaftesbury Avenue arrangements. The great necessity now was a road communicating with the north, starting from near the Law Courts, and this might be attained by pulling down one side of Dnry-lane, where the property was of a rubbishy description, and would eventually come down of its own accord. This would afford an eligible opportunity for carrying out a large scheme, dealing with workmen's dwellings, and of making at the same time a fine street which would relieve the traffic, and ought to be a very profitable speculation to those who undertook it. Mr. Nevill seconded the vote of thanks.

Mr. Hugh MacLachlan said that Mr. Stevenson had referred to the great disadvantages of straight lines in streets. These were carried out to an enormous extent in the United States, the play of light and shadow being altogether wanting. There had been several opportunities recently of laying out squares and circles in London, which had been altogether lost. Hyde Park-corner, the junction of Northumberland-avenue with Trafalgar-square, and Piccadilly-circus had been broken up into little archipelagoes, instead of one great plot, which would have been quite as useful for the traffic, and more architecturally striking. With regard to the laying-out of streets, what was wanted in large towns was an improvement in the pathways. The roadways were very fine and wide; in fact, sometimes too wide; but the pavements were hardly ever of sufficient width. A roadway for four lines of traffic was as much as ever was required,\* but a pavement of 16 ft. wide was decidedly necessary in some cases.

Mr. William Woodward remarked that fifteen years ago so warm a reception would not have been given to such a paper (cries of "Oh, oh"). Not only the British public, but the Institute, had been educated to take these matters into consideration. Mr. Stevenson had looked upon the subject with the eye of an artist, and at the same time had imported into his paper essentially practical considerations, his observations on some of the provisions of the Metropolitan Building Act being to his (the speaker's) mind most opportune and true. He disagreed with Mr. Stevenson on the matter of open thoroughfares. There should be no *cui de sac* to any London street, and the quadrangle suggested by Mr. Stevenson would not tend to the health of a large artisan population. With regard to turrets and spires, they would add very much to the picturesque appearance of the metropolis without doing any damage. Any person standing at Magdalen-bridge, and looking along the High-street of Oxford, must have been struck by the mingling of its Classic and Gothic architecture. The Institute, he believed, might take credit for suggesting some of the improvements which had taken place in London during late years, and if such gentlemen as Mr. Stevenson would only hammer away at those subjects they would be able in time to educate the British public to the standard which he hoped they would eventually attain. He thought the County Council would do well to consult the Institute on all matters affecting the general health and well-being of this splendid Metropolis (applause).

Mr. Edwin T. Hall drew attention to the fact that sometimes, owing to their position, straight streets might be an element of the greatest beauty. They might remember that the city of Turin was exceedingly beautiful, although it had rectangular streets from one side to the other. The same conditions would hardly apply to London, for the reason that it was unique, and that no general rule could apply to it. He could never understand the reason for the Metropolitan Building Act preventing any projections in front of the building line, excepting what were considered to be architectural. There was no limit in the Building Acts to the height of buildings, excepting when new streets were laid out. It should also be remembered that ancient lights constituted a property, and could not be got rid of except by compensation. As the County Council was now entering upon its work, the Institute might well make a series of recommendations to the Council, with a view to amending the Building Act. In fact, the present was the time when

the Institute might make its influence felt by giving practical suggestions which might prove to be of the greatest value.

Mr. Thomas Blashill, Superintending Architect of Metropolitan Buildings, said they must all agree that they had listened to a valuable paper, and in the main they would very much concur in what Mr. Stevenson had laid down. He, however, differed with him as to the dirtiness of ancient streets, which were picturesque; in fact, he had never seen such dirty streets as those of London (hear, hear). Mr. Stevenson also seemed to think that Paris was a dear city because so much had been expended upon its buildings, but that was not the case; the reason was that so large a number of people flocked to it in excess of its accommodation. Turin, which Mr. Hall had mentioned, he considered the most monotonous city he had ever visited (laughter). In spite of its prospect of distant mountains, and the novelty of being in a foreign place, its appearance was most monotonous, in consequence of the pernicious effect of its straight lines. With regard to the London improvements, every new street was curved, and it only rested with the architects to take advantage of their opportunities, which no doubt some of them had. When the projections proposed in a building came over a man's own land, the solution was comparatively simple, but when they came in front of the general line of building, it was only right that the neighbours and the local authorities should be consulted. A very large number of those applications had passed through his hands, and he could safely say that a considerable number of them had been sanctioned. The provision as to 44 in. window reveals in the Building Act might seem absurd, but in a narrow street there was a special danger of fire from opposite buildings if the wooden window-frames were brought flush with the face of the wall. In the old buildings, too, where the timber came right to the front, it was a solid piece of wood, which not only carried the window, but also the arch above. There was a good deal in what had been said about the possibility of having picturesque elevations by making the heights irregular, and the projections also irregular above the ground story, but he was afraid the clients were the great objectors. There were a great deal too many rules; indeed, he disliked rules and the enforcement of them if it could possibly be avoided. The important question of the accommodation for workmen was tied up with the construction of new streets. Mr. Nevill was the victim of a common fallacy when he spoke of pulling down a large sweep of buildings and making a profit out of it. If Mr. Nevill would take any district, and work out the value of property by the aid of some surveying knowledge, allowing also for trade compensation, he would find whether he could make any profit whatever out of it, or even avoid making a serious loss. The Building Act not doubt required amending very much, and he believed sooner or later, when the County Council had nothing to do, it would take the matter up (laughter and applause).

Mr. Charles Fowler remarked that, with regard to the heights of buildings, &c., before they called upon any authority to lay down rules, or criticised rules already in existence, they had better be sure they were all in accord as to what they wished to have. The last-proposed amendment of the Building Act was to restrict the height of buildings, and professional men were called before the Select Committee of the House of Commons to back-up the opinions expressed. Several architects and surveyors of large practice, however, supported the view that it was absurd to attempt to limit the height of any London building. Therefore, before they criticised the acts of the powers to whom authority was given, they had better be quite sure of what they desired to substitute. As to the crookedness of streets, any body of architects who spoke of laying out streets so as to make them crooked would be sure to be ridiculed by the public.

The President added that he was very pleased with what Mr. Blashill had said as to the ease with which they might get leave for projections over the streets. He could say that he had never found any difficulty about that, and he was rather surprised to find Mr. Stevenson making so much of the point. If architects tried for such things they were generally successful in getting them (applause).

The vote of thanks, on being put to the meeting, was very cordially received.

Mr. Stevenson, in his reply, said he had

certainly expected some opposition, seeing that the things he had been condemning were, so far as he was aware, the things that had been praised. He was, therefore, rather surprised to find that, instead of being opposed, he had been, on the contrary, blessed altogether. Mr. Hayward would like to have streets partly straight, and that was what he (the speaker) had said—that the streets should be made up of different straight pieces. Mr. Hall had referred to Turin as an example of what a fine thing straight streets were; and no doubt if one could get streets with colonnades on each side 24 ft. wide, each street ending with a background of snowy mountains, there might be some reason for having them straight. But where that was an impossibility it was, perhaps, an advantage to see the different buildings as they were turned round to the eye. There was a passage about the Church of St. Mary-le-Strand in his paper, which he had left out in the reading in order to save the time of the meeting, but which they would find in it when it appeared in the "Transactions."

The President announced that a Special General Meeting would be held on Monday, April 8, for admitting certain local societies of architects into alliance with the Institute, and for considering the report on a scheme of progressive Examinations proposed by the Education Committee.

The proceedings then terminated.

## Illustrations.

### THE CHÂTEAU OF AZAY-LE-RIDEAU.

THIS château, situated in the department of Indre-et-Loire, has a good deal of resemblance to the better-known château of Chenonceaux. Like the latter, it dates from the best epoch of the French Renaissance, and, like it, is picturesquely situated amid the windings of a river which, from almost every quarter, gives reflections of the château and its turrets.

The building, which is scheduled among the "Monuments Historiques" of France, replaced a former more ancient château which Gilles Berthelot, Treasurer-General of Finance and "Seigneur d'Azay-le-Rideau," caused to be demolished in 1520, that is to say in the first years of the reign of Francis I.

After Berthelot, the château changed owners many times; among them may be mentioned Henri de Beringhem, "premier ecuyer du Roi" under Louis XIII. and XIV., who added the stable buildings and the room called the "Chambre du Roi," in which Louis XIV. slept.

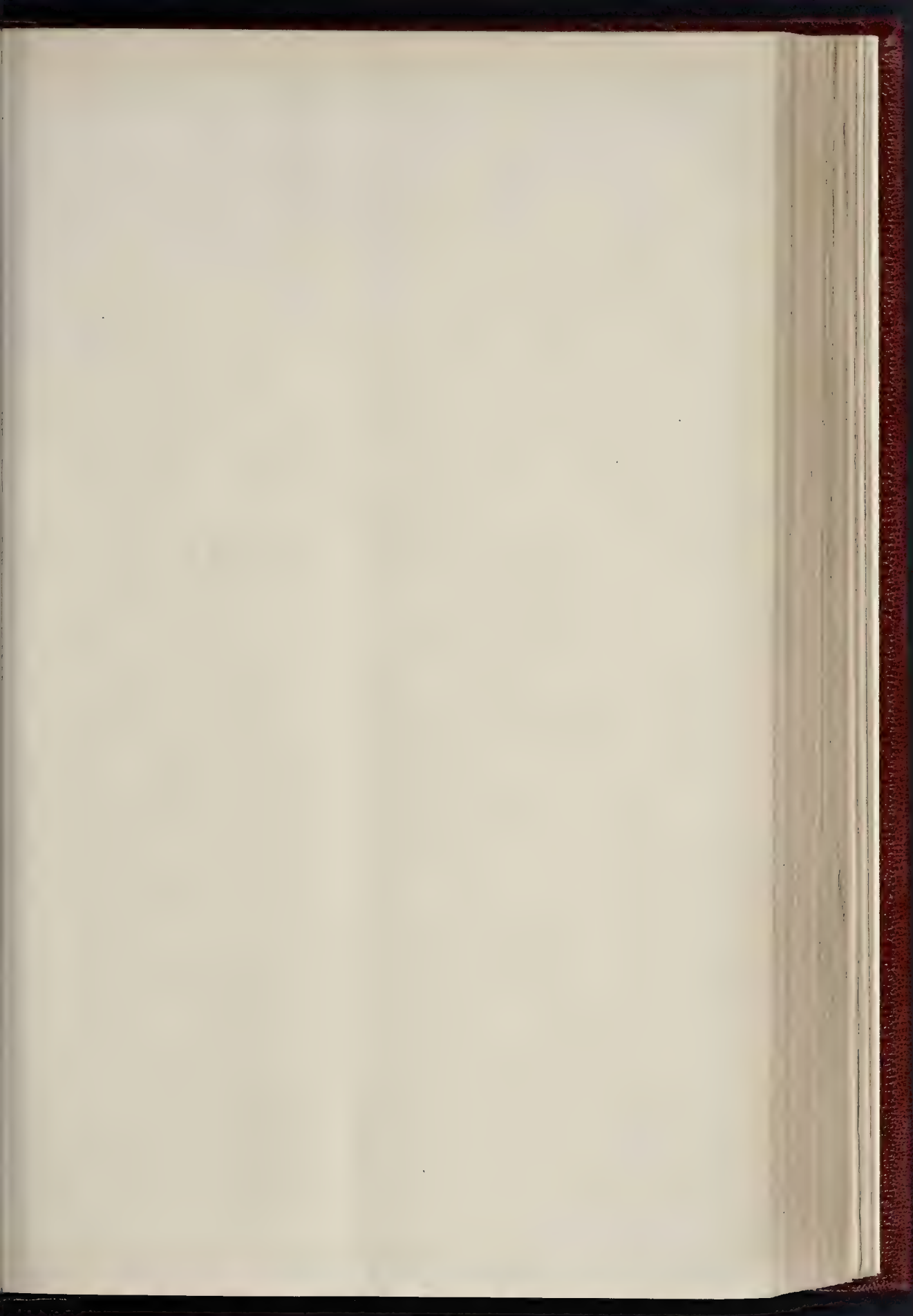
The château, built on an island formed by the Indre, presents a large main block flanked at the right by a return wing. The principal façade recalls, by the purity of its style and elegance of its details, the art of Jean Goujon. The most interesting part of the façade is the design of the portal, which is shown to a larger scale in one of our plates, amid the ornamental details of which the devices of Francis I. and Diana of Poitiers everywhere appear. This portal of three orders encloses a curious staircase. The two bas-reliefs on the first frieze represent the one an ermine, and the other a salamander in the midst of flames. The same subjects are repeated on the sills of the windows above the cornice. These bas-reliefs are accompanied by these two devices—NUTRISCO ET EXTINGUO and UNG SEUL DESIR. The columns with niches over them, now deprived of their statues, serve to unite the ground story with the upper stages of the design, where the pilasters and architraves are covered with arabesques of beautiful design.

Another entrance, also of great delicacy of detail, is made in the return wing; but it is generally by a smaller door to the right of the last-named, and giving access to the staircase of one of the towers, that visitors enter into the interior of the château, which has been very completely restored and contains many archaeological curiosities, as well as an important collection of paintings.

Among the principal rooms thrown open to the public are a small vaulted room situated above the entry; a very fine bed-chamber; a large salle-à-manger, a square apartment in the angle of the building and containing some fine furniture of the Renaissance period; a vaulted corridor decorated again with the Royal salamander; a large staircase, resembling in general design that of the Pavillon Sully at the Louvre, and a room which has a very fine chimney-

\* We do not concur in this view. In our opinion room for at least six lines of traffic is desirable in some streets,—two for light and fast traffic in opposite directions, and two for heavy and slow traffic; leaving space on each side of the street for vehicles to stop for loading and unloading goods, and for cabs and carriages to take up and set down passengers.—Ed.



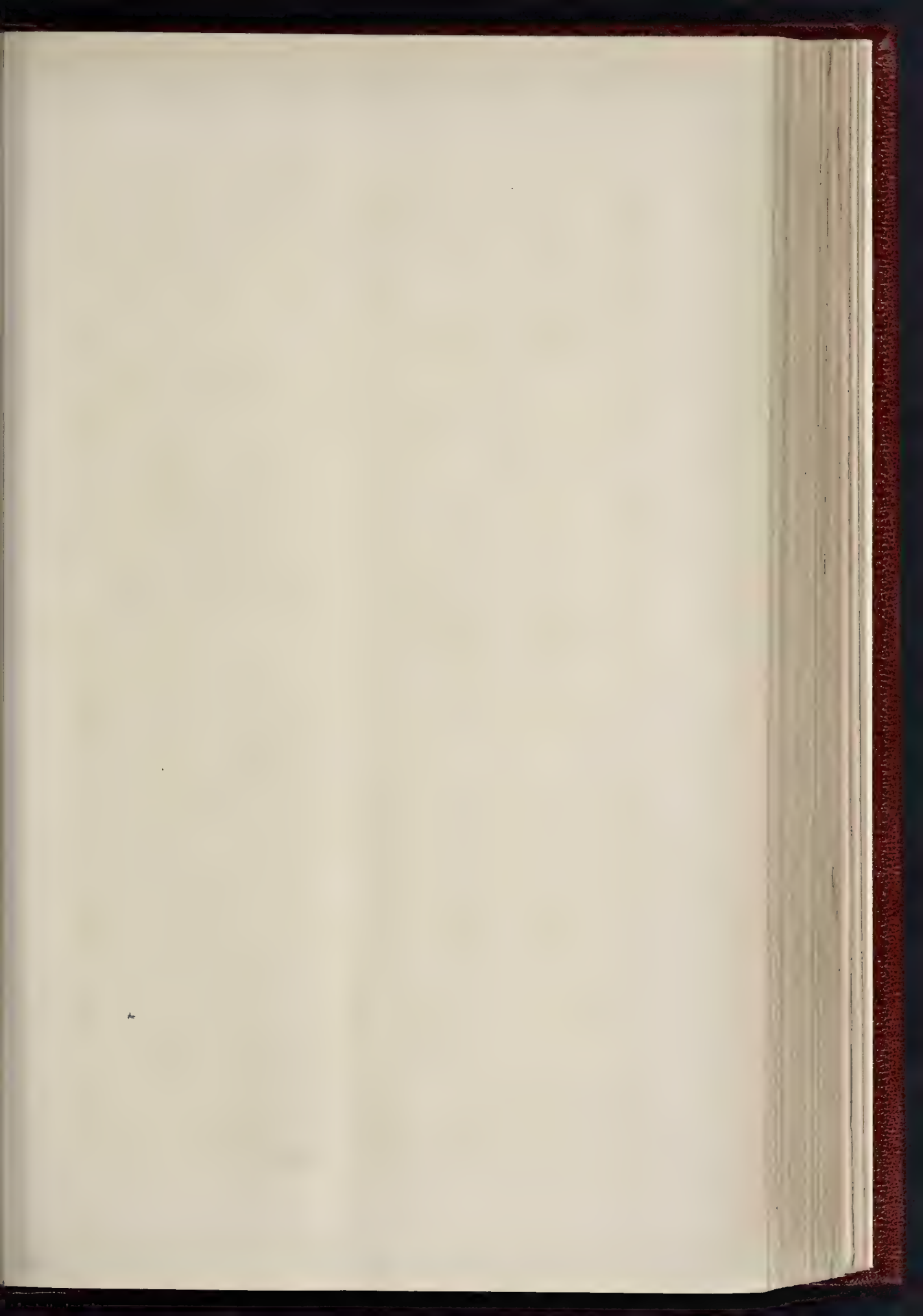




DESIGN FOR WALL.—By Mr. A. B. PITT, A.R.I.B.A.

(Drop pattern.)





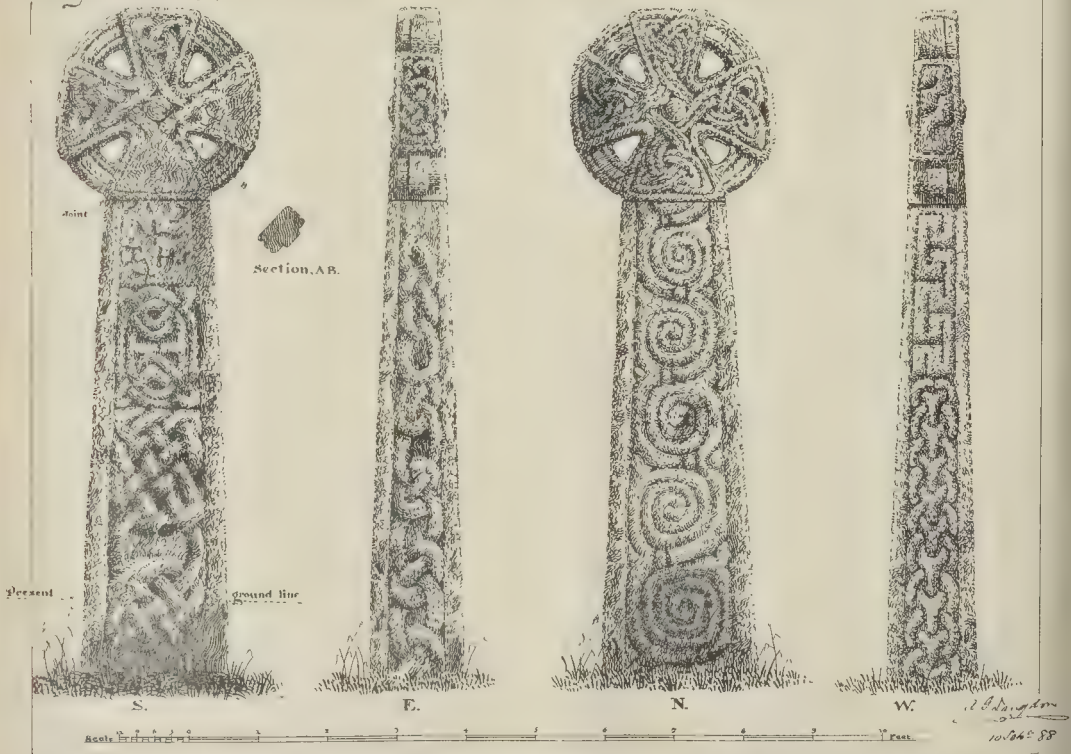
Four holes cross.  
S-Neot.

Scale 0 1 2 3 4 5 Feet.

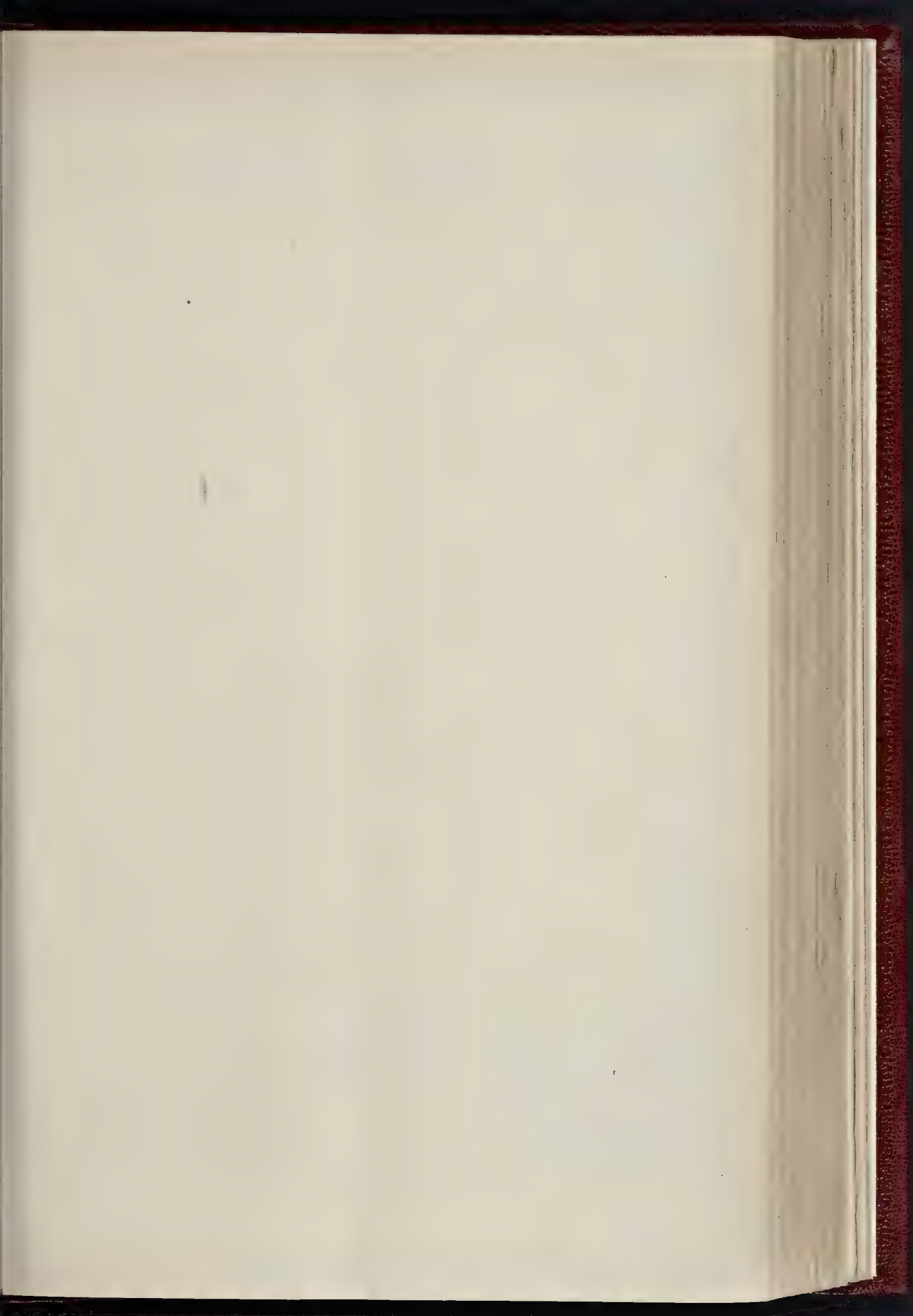
Note. The dotted upper portion is gone

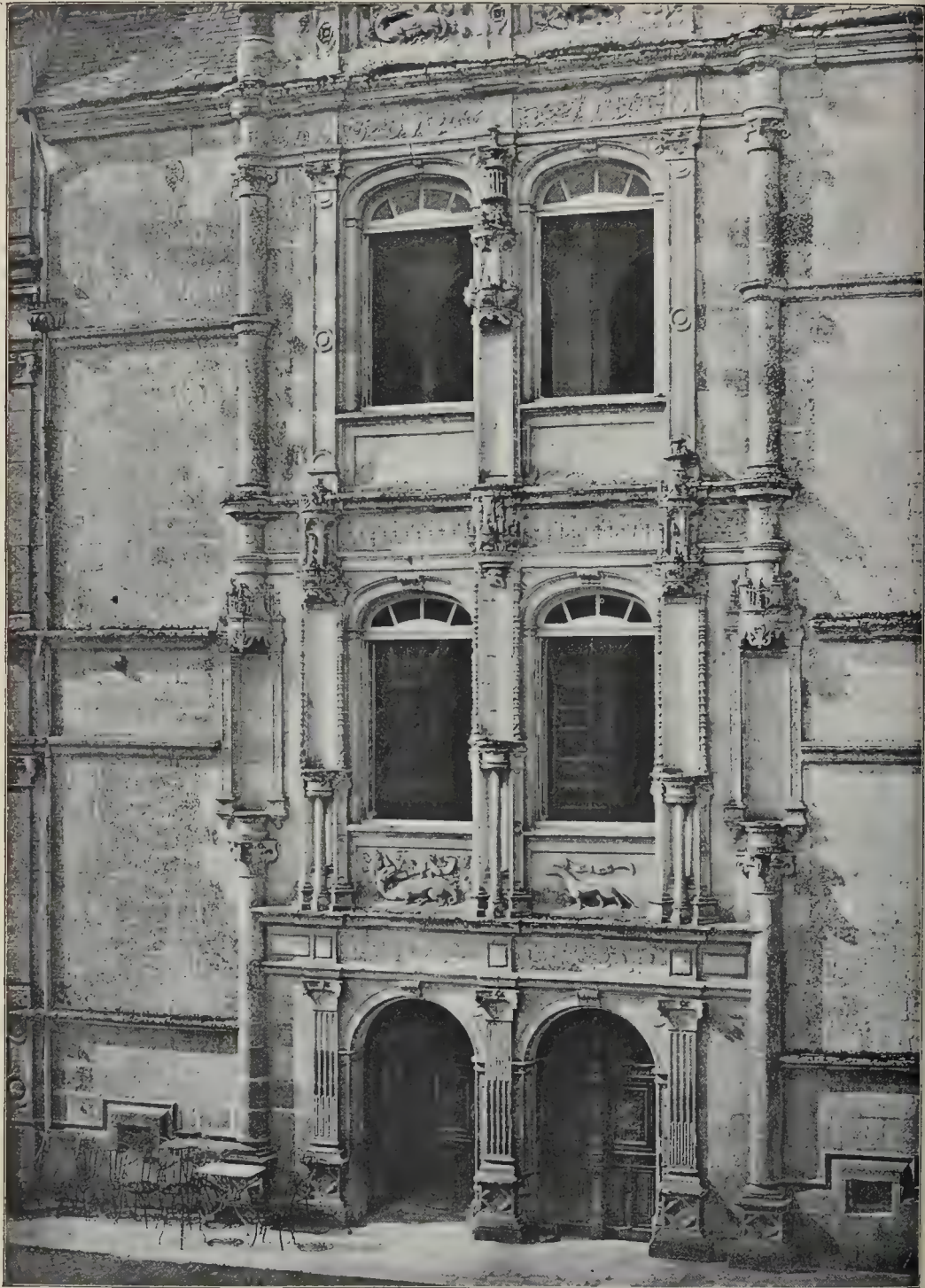


Cardynham Ch. Va.





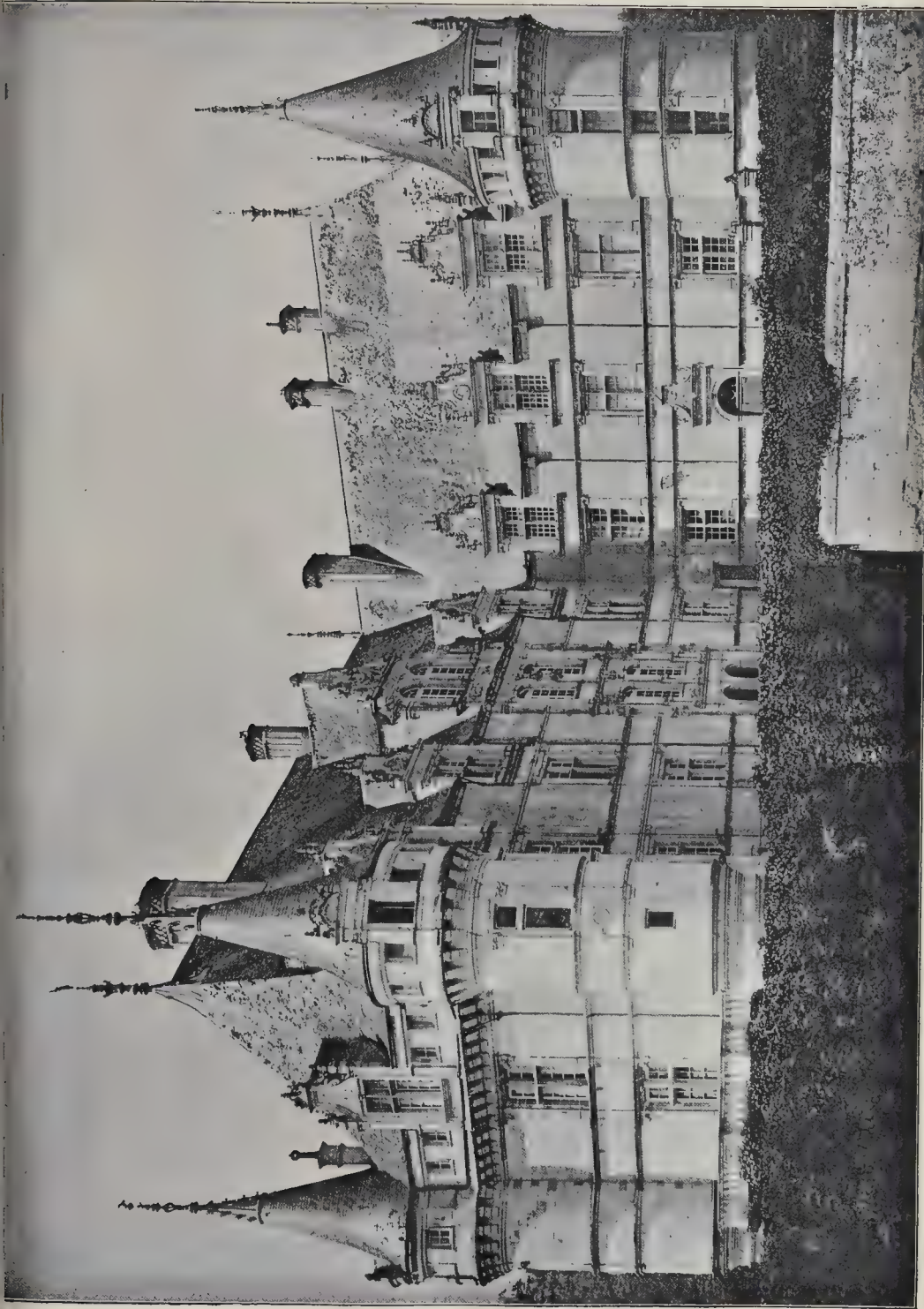




The Phototype Co., 30, Strand, London.

CHÂTEAU AZAY LE RIDEAU. DETAIL OF ENTRANCE AND WINDOWS OVER.





The Photoje Co., 30, Strand, London.

CHÂTEAU AZAY LE RIDEAU. GENERAL VIEW.





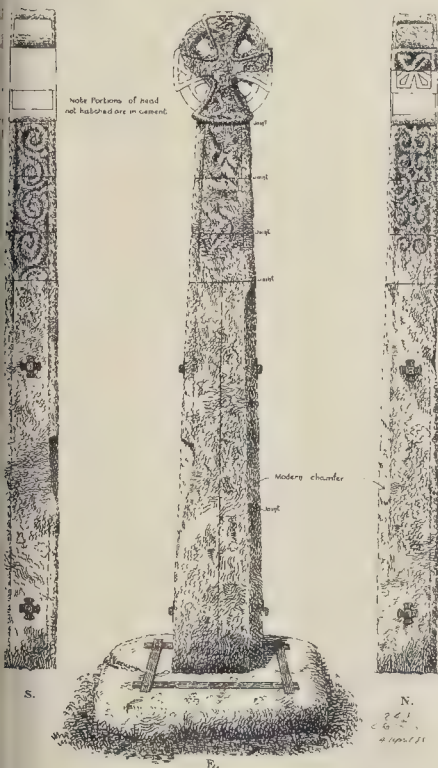
Lanherne.



Prideaux Place.  
Padstow.



S. Teath.



Quethiock, Ch. 7d.







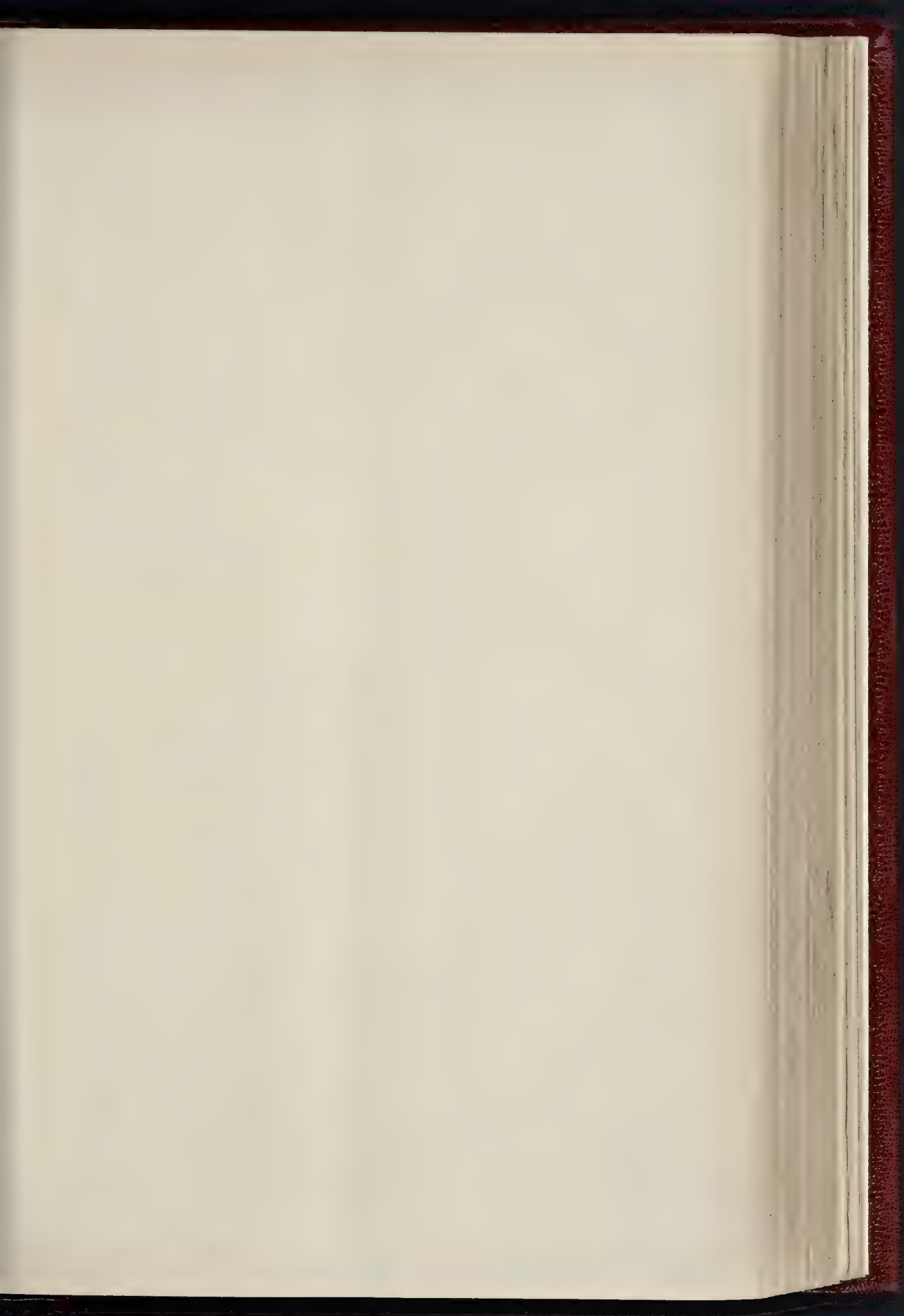


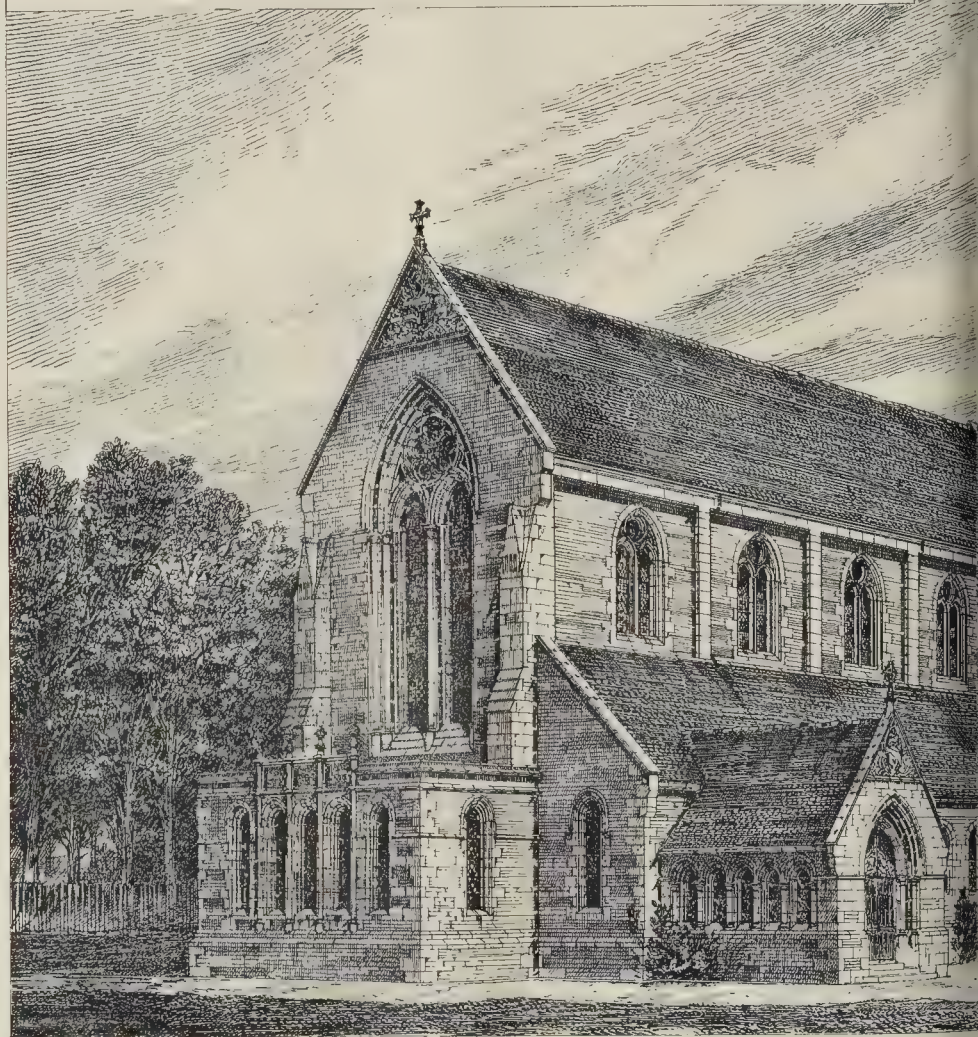
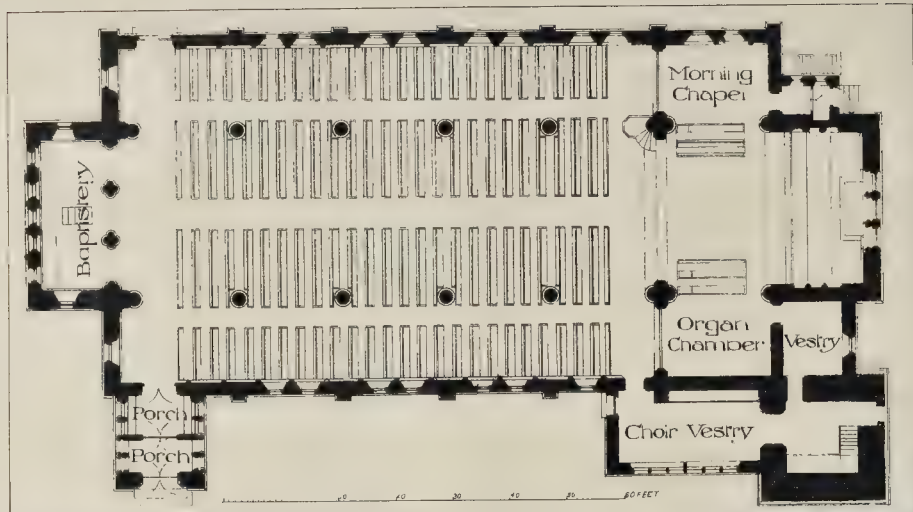
DESIGN FOR WALL.—By MR. A. B. PITE, A.R.I.B.A.

(Drop pattern on alternating blocks)









CHURCH OF ST. GEORGE, NEW YORK



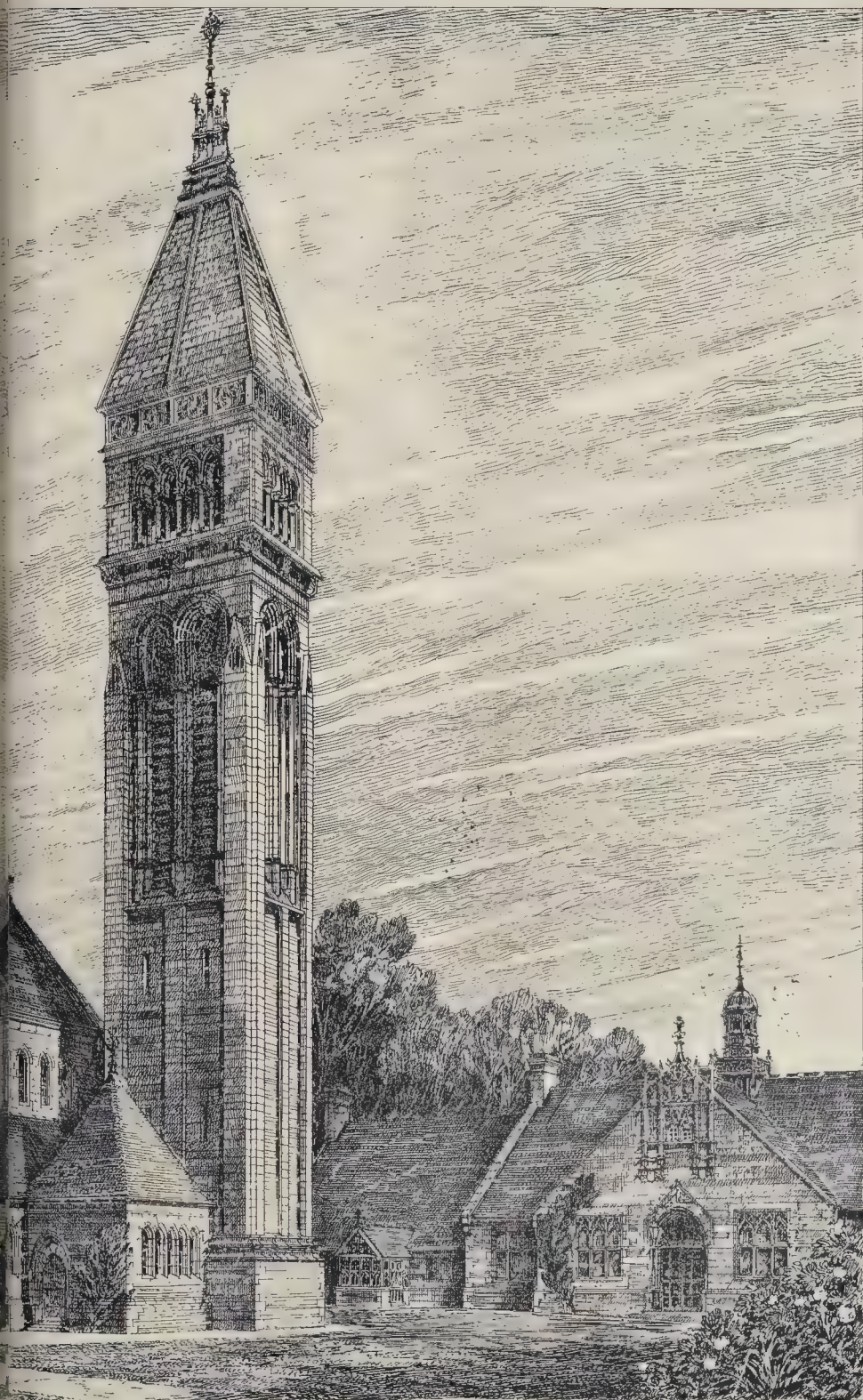
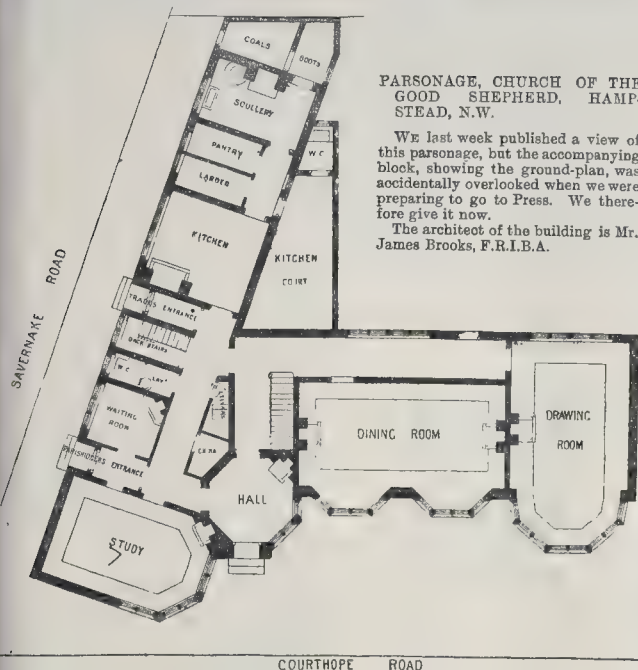


PHOTO LITHO SPRAGUE & CO 22 MARTIN LANE LONDON E.C.







PARSONAGE, CHURCH OF THE GOOD SHEPHERD, HAMPSTEAD, N.W.

We last week published a view of this parsonage, but the accompanying block, showing the ground-plan, was accidentally overlooked when we were preparing to go to Press. We therefore give it now.

The architect of the building is Mr. James Brooks, F.R.I.B.A.

#### THE DESIGN AND MANUFACTURE OF WALL-PAPERS.\*

In attempting to describe the art and practice of designing wall-papers, it is difficult to avoid entering on the very well-trodden and wide field of general decorative design. We had better, therefore, agree that a handbook or a course of lectures by some well-known and popular ornamentist be taken as read, and proceed to such particulars as shall enable us to better understand some of the excellent papers that are now being produced, so that, knowing what is best both in design and manufacture, we may stimulate the demand for papers of artistic excellence.

Perhaps it is scarcely necessary to maintain here that wall-papers, in selection and use, and consequently in manufacture and design, are within the province of the architect's direction.

In a generally figurative sense, if piers, beams, and rafters are the bones of our rooms, and brick, stone, and plaster the flesh, the wall-paper provides the complexion that gives charm and beauty to the home. Wall-papers are, in fact, the backgrounds not only of our pictures and looking-glasses, but of our whole social life; they surround us at day and night, at our meals, in our drawing-rooms, offices, and bedrooms. In our passages and halls they give comfort or chilliness to the whole house, while in the sick-room their designs,—more than their poisonous or non-poisonous constituents,—excite or calm the delirious visions of the patient. This, as most of us know, is no exaggeration.

Unhappily, we have become accustomed to the presence of a strong line of demarcation between the architect's ideas of artistic internal effect and the upholsterer's conceptions on the same subject. Nearly all architects must be painfully aware how bad furnishing mans good buildings: it is really beyond their province, and they feel helpless. But in wall-papers we are upon a borderland between the two foreign peoples, and if our selection of papers is judicious, we shall find curtains and carpets beginning to rhyme with our walls, joinery, and ceilings. I say "rhyme" rather than harmonise, for we are apt to lose sight of the powerful quality of contrasting effects. Love of harmony may become morbid, even in architects: for example, the insipid effect of the pale-green window-frames in red brickwork that we have seen, rather than the clear, bold contrast of the white frames. If wagons were painted in harmonious rather than in contrasting colours, and if military uniforms were in æsthetic tones of harmony, we should be deprived of distinct elements of beauty in our somewhat murky surroundings. I digress upon this point because in the internal arrangements of our homes it is a hopelessly expensive and unprofitable task to attempt to reduce walls, paintwork, ceilings, stuffs, furniture, pictures, and mirrors to harmony. Be prepared, in selecting your wall-papers, for healthy contrasts of colour and form in the final effect of the room when furnished. "Proceed carefully, and you will do as a wise and prudent man ought to do," is the advice in Wilars de Honecourt's Sketch-book, and this will enable you to avoid such exaggerations of contrast as the use of a wall-paper consisting of nothing but vertical stripes of blue or pink and white,—a curiosity of taste borrowed from the French. I found a paper of this sort the other day very oddly covering the walls of a small business room in one of the finest of Mr. Norman Shaw's London houses, though the other rooms were in all respects handsomely and consistently decorated. The evident idiosyncrasy of the tenant produced a too violent contrast, and the effect was almost ludicrous.

We can all remember the unsophistically pictorial and naturalistic wall-papers of our grandfathers' houses, which qualities certainly have the merit of making impressions upon children's minds. They dreamt that they dwelt in marble halls, and realised their dreams in their blocked wall-papers; and in their printed oak-grain gave us a faintly-surviving tradition of the days when real oak wainscoting dispensed both with decorator and wall-paper manufacturer. But other influences of a different artistic nature are apparent. Do not the landscapes,—generally mountainous,—the verdant valleys, luxurious pines and palms, and occasional ruins, and perhaps cloping lovers, betoken the influence of the romantic landscape painters, with

\* A paper by Mr. A. Beresford Pite, A.R.I.B.A., read before the Architectural Association on the 15th inst., as briefly mentioned by us last week.

ce. The rooms on the second floor contain number of historical portraits.

More fortunate than Chenonceaux,—which as put up for sale after the bankruptcy of its proprietor,—the château and manor of Azay-le-Rideau remain in the hands of a gentleman of old family, M. le Marquis de Biencourt, who is a lover of history and archaeology and has preserved the place with the greatest care. Thanks to him, the archaeologists and travellers who visit the district of the Loire, so rich in old châteaux, can find here, nearly intact, one of the finest examples of early French Renaissance architecture.

#### CHURCH OF ST. GEORGE, NEWCASTLE-ON-TYNE.

This church is now in course of erection at the north end of Osborne-road, and is, together with the site, organ, and a peal of eight bells, the gift of C. Mitchell, Esq., of Jesmond Towers, in the parish of West Jesmond. The total length, including baptistery, is 150 ft.; width, 40 ft. It consists of a nave, north and south aisles, chancel, baptistery, organ-chamber, clergy and choir vestries, and a morning chapel.

The whole of the seating, choir-stalls, organ-chairs, morning-chapel screens, and aisle sedes, are in wainscot oak, the seats being placed on a teak block floor. The altar and credos are elaborate in detail, and are executed in Pavonazzia marble of quite an exceptional quality. The floor of the chancel is to be laid in inlays of rouge, jasper, and Sienna marbles. The whole of the aisles, baptistery, &c., are to be of Rust's vitreous mosaic, embracing various emblems, worked out in rich schemes of colour.

The walls of chancel for a distance of 5 ft. from floor are to be lined with rich red marble, over which is to be a 4-ft. frieze of elaborately painted tiles, and above these figure-subjects are to be executed in mosaic.

The font-bowl is of Mexican onyx, placed on an arched base of alabaster. The font will be a cover of richly-wrought iron and copper work.

The east and west windows are to be filled with painted glass illustrating the "Nativity" and the "Crucifixion." The altar-rail, pulpits, gas-fittings, &c., are to be in combinations of brass and copper work of a specially ornate character.

The contractor for the building is Mr. Amos & Co.; for marble-work, Messrs. Emly & Sons;

and for carved oak-work, Mr. R. Hedley and Messrs. Robson & Sons, all of Newcastle-on-Tyne.

The metal-work is by Mr. A. Shirley, of Cable-street, London.

The architect is Mr. T. R. Spence.

#### CELTIC CROSSES IN CORNWALL.

THESE illustrations are from drawings by Mr. A. G. Langdon, of whose lecture on the subject, recently delivered before the British Archaeological Association, a *résumé* will be found in another column.

#### WALL-PAPERS.

THE two illustrations are of papers exhibited as examples of "drop-patterns" at the last meeting of the Architectural Association, in connexion with the paper which we print on this and succeeding pages.

In each case two widths of paper have been photographed in order that the "drop" in the hanging might be exemplified. The papers are produced by Messrs. Hayward & Son, from designs by Mr. A. Beresford Pite.

#### The Artists' Volunteers' Headquarters.

His Royal Highness the Prince of Wales formally opened the headquarters of this corps on the 25th inst. The façade of the new building is in the Renaissance style, with red terra-cotta dressings. The large medalion over the entrance was executed by Mr. Brock, A.R.A., who is a lieutenant in the corps. On the ground-floor is a large entrance, 10 ft. wide, with orderly, committee, officers' and commanding officer and adjutant's rooms, and a spacious drill-hall, 100 ft. long by 52 ft. wide, top-lighted, with a gallery at the south end, 52 ft. by 15 ft. In the basement are the armoury, rooms for quartermasters' stores, lavatories, and dressing-rooms for the men. On the first floor a large general room for the men, 52 ft. by 20 ft.; canteen, with lift to kitchen over, and sergeants' room. On the top floor are dressing and bath-rooms, &c., for officers and sergeants, and accommodation for headquarter staff. The total cost of the new building, including furniture, has been 6,500*l.*, of which the officers, non-commissioned officers, and men have subscribed 3,200*l.* The work has been carried out under the honorary architect, Colonel Edia, by Messrs. Charles Kynoch & Co., contractors, Clapham.



Claude at their head, and an early exponent in our grandfathers' co-temporary, Turner? This grandiose scenery is also to be found on print blinds and ceramics, but by the time of our early childhood it had dwindled into Red Riding Hood and "The House that Jack Built," lately so happily revived in æsthetic and decorative garb.

Our fathers' houses are even now recording another past epoch, that of the stern revolt from scenic taste to Gothic sterility of internal comfort. What a variety of stencilled horrors arose to supply the lack of all precedent, upon which alone the revival could flourish!—mostly of distemper in plain tints, "French grey" being a favourite, as it was thought to go well with varnished pitch pine, the chasteness of whose stop-chamfers required the absence of other surface decoration. Comfortless stone and tile mantels, and scraggy wrought-iron gas-fittings, complete the characteristic Gothic interior.

There were a few bold spirits who attempted wall-papers. Pugin the younger, if not his father, tried to adapt stencil patterns that would have done fairly well for the decoration of detached blocks of masonry. Other horrors in laundress's blue and gold, or in crimson flock and gold, and other things mostly heraldic in origin, followed, and were used for church chancels and the choicest Medieval houses.

Some decorative designs of E. Viollet-le-Duc's used in Pierrefonds, suggest wall-papers, but they are all violent and crude in white, crimson, and gold.

Some clever architects attempted patterns from encaustic tiles, and were gradually led into adopting the peculiar form of stiff-neck that infected all Medieval metal-work a few years ago. When the late Mr. B. J. Talbert, who had been a great sinner in this latter respect, discovered the sun-flower, a very marked change began to be felt. Mr. E. W. Godwin and Mr. Eastlake then showed us how to use bamboos and pomegranates, they having learnt from the Japanese and Italian fabrics, and we then found ourselves fairly launched upon the stream, some part of the flood of which is represented here to-night.

The progress of household decorative art has in no branch been more marked than in wall-paper design. A study of decoration, as distinct from the pictorial and realistic attempts of our grandfathers, and from the antiquarian pedantry of our immediate predecessors, has been most beneficial, but we are still far from having attained to the tableland of artistic rest, and must still climb.

We have only to a very small extent yet made use of any forms other than leaves, stalks, and flowers of conventional or natural character. The study of Japanese art has opened our eyes to free decorative effects, and released us from the sadly petrified bonds of architectural ornament as the only source of idea. But there is a tendency in another direction which may result in a bondage to the patterns of woven fabrics. I am aware of the fascination of the wonderful collection at the South Kensington Museum. By all means let us make use of it as a school of design and fount of beautiful colour, but remember that we want printed papers for nineteenth century life, costume, and atmosphere, and that our prints are smoothly pasted to walls, and do not hang in luxurious folds around duennas' waists or sweep the ground in their trains. Some of the finest patterns of our day are edited from this collection, distinguished by largeness, softness, and beauty of outline, and velvety colourings.

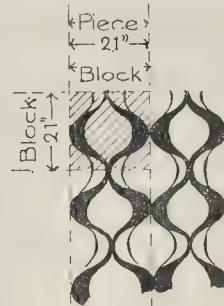
I am afraid that the charms of these fabrics have overweighted the artistic judgments of some of our ablest designers, and a failure to appreciate the more logical requirements of a smooth vertical wall-covering is the consequence. My meaning may be more apparent if I suggest a mental contrast between the broad effect of an Arab wall-pattern and that of an Italian Renaissance brocade done into a wall-paper.

The infinity of geometric design is at our disposal, besides the world of landscapes, marbles, oak-grain, stencils, and botany, upon which we have touched. The wide, wide world, ever widening in imaginative design, is a kaleidoscope for the decorative artist to turn and portray.

In practical design the wall-paper pattern is 21 in. wide, the size of a trimmed piece of paper, unless some exceptional width or foreign size, as that of French paper,—which is 18 in. wide,—is required. The most convenient length of pattern

is about 21 in. as well, though this is not arbitrary, as the piece is 12 yards long. If the pattern cannot be repeated, being of too large a scale, with a single block of 21 in. by 21 in., a second block may be designed to work alternately in length, the hanging of the pieces side by side securing the repetition in width.

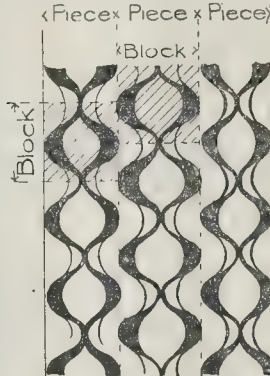
We will take then a small one we have only to draw it over the surface, taking care that the top and bottom edges join one another in repeating, and the sides as well. It is not necessary that the pattern should cover the whole block; it may only be upon a part, but this must be proportioned to the whole so that it repeats not only within the block but also with its own edges, which become neighbours when the paper is hung (fig. 1).



1  
A Plain Repeat Pattern

The single block of pattern is thus repeated throughout the length of the piece, vertically, and when hung horizontally around the wall.

The "drop pattern" is a device for obtaining an alternation of horizontal pattern, the centre of each block of the pattern being dropped in hanging the adjoining pieces so that the centres take a diagonal line across the wall (fig. 2). The



2  
A Drop Pattern  
N.B. Same Block as 1  
but hung as drop

alternate centres will, however, be level with one another if the pattern drops half its own depth. The designer is thus enabled to use half the width of each adjoining piece for radiations, or branches from the centre, having to provide on the block for radiations from the adjoining centres.

The design having been made of suitable size, it is handed over to the block-cutter to prepare the block from which the pattern is printed.

This craftsman,—for block-cutting is generally no part of the paper-stainer's establishment,—translates the drawing by reversing it, so that the print responds to the drawing, in much the same way as the wood-engraver of pictures. He cuts out of his block the "lights," leaving up the lines and masses of the "darks." A block-and-white drawing is thus reversed, the lines being left and the spaces out. However, as the paper will not probably be printed in black and white, no artistic consequence is attached to this change, and you will have, in colouring the design, the opportunity of printing light tones on dark, or dark tones on light.

A separate block will have to be cut for each colour in the pattern upon the ground, as with the stones in lithography. The processes of machine-printing, upon which I can only touch, are, however, entirely different, both in methods and results, as all the colours can be printed at once.

Long patterns are obtained by using two alternating blocks that work to each other's edges; and if four blocks,—that is, two in depth and of two pieces in width,—are used, a pattern 42 in. by 42 in. can be obtained.

Free "wall-over" patterns and flowing forms are never finished to the square line of the edge of the block, or probably a horizontal joint would be visible all round the room when papered; but advantage is taken of the formation of the design to break one block of pattern into its upper and lower neighbours. The corresponding treatment of the vertical edges of the pattern wholly rests upon the designer, if the paper is hung properly.

The block itself is interesting before the cutter commences work, for it is of vital importance that an absolutely level surface should be secured throughout its subsequent career in the varying climates of the factory, as well as in baths of water and oil colours, and under intermittent pressure. It is, therefore, composed of at least three thicknesses of wood, a hard surface of pear-wood,—our useful "square tree"—or of sycamore, with two grooved and reversed backings of deal, altogether about 2 in. thick. The printer adds pins in the corners to enable him to fix the blocks of the pattern with accuracy to the paper, and a strap handle at the back for lifting it in and out of the tray of colour.

Wooden blocks pure and simple, however, cannot be cut to produce very fine lines or dots in the pattern, and recourse is had to thin copper lines where necessary, and points for dots, which are all bent and hammered into the surface of the block by hand. In elaborate or delicate patterns this is a laborious and costly operation. A glance at the real block will show how patiently and artistically it is carried out. Some blocks, where there is a large quantity of copper-work, have a most beautiful effect, and I doubt not, in years, may, centuries, to come, when the nineteenth century copies to the New Zealanders the same relative position as the thirteenth century does to us, that some diligent brass-rubber will find delightful occupation upon the floors of wall-paper factories, as I have observed, in more places than one, that by-gone blocks become the pavement of the cellars.

The pattern-block being complete, we consider the paper next. Patriotism demands that it should be of English make, and tradition that it be 22 in. wide. The manufacturer supplies continuous rolls of this width, which is cut,—when honestly done,—into lengths of 12 yards, and a trifle over for starting and finishing the pattern. The pattern being 21 in. wide, a margin of, say,  $\frac{1}{2}$  in. on each side is left for trimming; the net size of a "piece" being 21 in. wide by 12 yards long, and contains 83 superficial feet. The paper is white or ordinary and best use; but there are other kinds known as "pulp," some of which we know as tinted lining papers. These are often of very serviceable and artistic colours, and save the trouble and expense of covering the paper with a coloured ground. A useful grain, and sometimes a glossy surface, are obtained in "pulp." The substance is, however, softer, more porous, and less durable than that of good white paper. For safe low tones of colour and economical prices these kinds of wall-papers are highly to be recommended.

The colours with which the papers are printed are simply ordinary tempera, consisting of the colouring pigment, a body of whitening, and carefully prepared size. Apart from the æsthetic mixing of the colours, skill and experience are required to ensure a permanent colouring, and



ground that will retain substances such as oil, to give the paper surface and polish, or at least shall form a safe body upon which to lay the oil size, and be the means of obtaining many other little effects which are the craft and mystery of the paper-stainer's art. Exceptional papers have exceptional treatment from the commencement, but we cannot stop to consider any but the fairly general methods of manufacture. Oil-colours are used with a richer effect of body-colour resulting, and some very noteworthy and ingenious tones have been obtained by using transparent washes—i.e., colour, water, and size, omitting the body of oiling.

For "flocking," a strong oil size, mixed sometimes with copal varnish, is required; but this is colourless. The boiling of the size and its composition receive special attention by each manufacturer, but for obvious reasons I cannot particularise methods. You may be solaced by the reflection that Messrs. Gunter, of Jubilee Lake and calves' feet jelly fame, for many years applied one of the best-known wall-paper manufacturers with size by the ton, that approached in expense the favourite comestible.

The pigments are ground by the maker's machinery, and should be tested for arsenic, though I am afraid if the public were to insist upon all other less notorious, but equally powerful, poisons being eliminated, the artist's palette would be seriously contracted. Arsenic poisoning, with pirates and smuggling, seems to have gone out of fashion for the present, but the suggestion of tragedy, even in wall-papers, is, perhaps, appreciated by the public, and arsenic is happily ostracised.

The bowl of colour being mixed, the piece of paper is spread upon a long table, and rapidly and skilfully covered by two or three pair of hands, large bristle brushes, deftly wielded, softening the brush-marks, and leaving a perfectly flat tint.

The piece is then hung up from the ceiling to dry, in about four loose folds, the temperature of the drying-rooms being kept up by stoves and pipes.

Talc grounds are at present very popular, some pleasing effects being obtained by colouring over and under the talc with opaque or transparent colours, and by rolling, and to some extent polishing the surface.

The talc,—which is synonymous with mica,—is ground to a fine dust and is powdered on to the colour when partially dried; a handful is thrown across the piece, which is then lifted from one end and smartly rapped underneath with a cane, until the talc has passed over the whole surface. This is performed either on the rounding-table or in a sort of bath. When the talc piece is dry, it is brushed and passed through a rolling-mill of considerable power, to thoroughly smooth and ingrain the particles.

A special preparation of size and oil-colour is the ground of the "satin-finish" surface; this, when dry, is powdered with fine French chalk, and polished with a machine-brush revolving with great rapidity upon the paper under considerable pressure. There are a few "refractory colours" that will not polish without a fine powder of the best mottled soap. All lines, dots, or diapers upon the grounds are printed from blocks before the main pattern is set down.

The embossing is a final process, and is done after all the others are completed. The paper is passed through a rolling-mill, the under roller being of gun-metal and the upper or matrix of paper, layers of paper, softened by water, being compressed by hydraulic power into a mass that becomes as hard as iron, and which almost polishes; upon this the metal roller, as a die, makes its print, and the piece of paper consequently receives a perfectly simple and clear impression.

I have interpolated this process out of its chronological order, as, like the grounding, it covers the whole surface of the paper. We therefore resume with the dried ground colour, with or without a "talc" surface or "satin finish," ready for the printer.

The printing-press is a remarkably Medieval-looking machine. The printer stands at the table with a lever between his feet, with a long arm overhead, and a bar to transmit pressure to the block; from the right the grounded paper is pulled on to the table and passes to the left after printing; on the right a little behind is the tray of colour. The block, which when new has a few days' soaking to prepare it, is dipped in a kind of sieve, having a blanket bottom, upon which a boy brushes the colour before

the block is dipped; the sieve rests upon an elastic bed of pulp, so that in pressing the block upon it a uniform colouring of the engraved surface is ensured. The boy dips the block and hands it to the printer, who carefully and rapidly adjusts it on the piece; the skill with which this important operation is conducted is worthy of a finished draughtsman, and the little pins being placed to print marks on the margin, a small block, or arm, is placed on the back of the block, and the printer, putting all his weight upon the lever, prints the pattern. On raising the block, certain little blobs of colour have to be moved or spread by a finger or camel-hair brush, and the pattern, if a single print of one colour upon the ground, is complete, and it is hung up and dried as before. If two interchanging blocks are required to make the pattern, the dipping and printing are just as before described. To relieve the printer's hands in lifting the blocks, an elastic cord is contrived, by which they hang from above.

Each colour in the pattern is separately printed and dried (there are special exceptions, however), and passes through the press under the block containing the portions for the current colour. The number of these printings involving labour and extra blocks becomes a basis by which the cost of the paper can be estimated.

Raised patterns or grounds are obtained by the use of flock, a finely-powdered wool that is caused to adhere to the surface of the paper. Flock-papers seem to be in increasing demand; they have a richness of effect, as a delicate play of light and shade is added to the colour. A boldly-flocked paper also affords an excellent ground to be decorated with gold or scumbled colour. If the paper is to have a pattern in flock upon plain ground, the printer prints the block with an oil-size of sufficient strength, applying great pressure, thoroughly working the size upon the ground. The piece as soon as printed is placed in a long tray having a canvas bottom, and handfuls of flock are thrown across it. It is then caned, as in the talcing process, but beaten from below a canvas tray. The tray catches the wool that does not adhere to the size, and as each fresh length is treated, a handful of fresh flock has to be added to maintain a supply of the finer particles. The flock is dyed to the required colour before use, as it cannot be printed upon. Flock of the natural colour is more bulky than when dyed, and forms accordingly a heavier surface. A paper that is but once flocked has scarcely any perceptible relief beyond the change of surface; it is therefore successively printed with size and flocked again and again—twice flocked, thrice flocked, six times flocked, as the case may be. The flocking is executed with such precision that it is hard to realise that the clean, sharp edges of the patterns have not been cut out, instead of being dusted on in six layers of wool.

The gliding of high-class papers is printed with the best gold-size, and the leaf laid by hand and brushed as in ordinary work. Metal dust is used for cheaper effects, and is dusted over the size.

Time forbids me from enlarging upon the many variations of processes and the resulting effects. There are many examples among first-class papers of much ingeniousness and skill. Though the machinery and methods are most primitive, we must not forget that the inventive faculties of wall-paper manufacturers are neither dull or non-existent, but they wisely concentrate their powers upon obtaining artistic effects in the papers rather than in the machinery. The manufacture is essentially a handicraft in every department of which the craftsman's skill and cunning are necessary to artistic success.

The introduction of steam machinery has not yet taken possession of the real territory of artistic wall-papers. In the machine, metal rollers replace the wooden blocks, a separate one for each colour, but all work upon the paper at once. The making-up of the machine is a long and troublesome operation, which does not "pay" unless a very large number of pieces are rolled off at a time. A thinner and commoner paper is used, and a very cheap article is the result, in which the different quality of the metal print from that of the wooden block is very apparent. However, there is no reason why the cheaper kinds of papers should be offensive in forms and patterns to the artistic sense, and we welcome the excellent designs in machine papers that have,

I think for the first time, been put forward this year by Messrs. Jeffrey.

Mr. Heaton uses stencils upon the printed papers, thus adding further handicraftsmanship, and a rich complexity or depth of pattern is obtained. A somewhat similar result is obtained in Messrs. Hayward's papers by boldly printing one pattern upon another. Small and delicate underprints are used by several makers with success. Blotch blocks are also used. A broad margin is cut to the pattern upon a fresh block and printed in lighter or darker tone of the pattern colour. The ground surface is thus reduced and solidity of effect gained.

Rather outside the limits of the subject are the many kinds of embossed imitation leather papers that have recently been published. Costly copper dies have to be made, and the paper is pressed in very heavy die-presses. The surface is hardened to take decoration and lacquer or oil colour. These raised and embossed designs embrace other substances than paper, which I must leave by drawing your attention to Mr. Walter Crane's "Golden Age," and to the die of another design lent by Messrs. Woollans. It is probable that such artistic manufactures will be in increasing demand as public taste becomes healthier; but we all hope that the clear lines and beautiful colours of fine wall-papers will never be driven off the field by any competitors, however beautiful in themselves.

Mr. William White, F.S.A., opened the discussion by proposing a vote of thanks to Mr. Pite for his very interesting lecture. In everybody, he believed, there was an innate love of colour, and although it was said that a very large number of people were colour-blind, the proportion was in reality very small as compared with what it was supposed to be. He had always been struck with the fact that decorative colouring was exactly akin to music, the melody being the outline, and the harmony being the colouring filling up that outline. Few, indeed, were insensible to the effect of the colour with which they were surrounded. That might be simply illustrated by observing the difference between entering a room which was simply whitewashed, or another room which was merely grey, or, again, a third room which had an agreeable colouring. Those who talked about the effect of colouring being a mere fancy were under a delusion themselves. Colouring had an effect even upon animals, and there was no doubt it did affect people in their daily life, showing the vast importance of having it properly developed for daily use (applause).

Mr. H. W. Pratt seconded the vote of thanks, and spoke of the great strides that had been made within the last few years in the direction of the design of wall-papers. Some of the most charming designs were now to be had for the asking, which, some years ago, could not by any means have been obtained. They ought, therefore, to congratulate themselves, as architects, on the fact that the manufacturers were now alive to the wants of the age, and were so ably seconding their endeavours to get better decoration introduced into their houses. He was delighted to see upon the walls such specimens of bold decoration. They had been too long accustomed, in looking through the manufacturers' books, to small designs and niggling patterns, but such advances had now been made that something like effective and bold designs were produced. He thought that architects were now coming to the conclusion that they had been mistaken in the past in supposing it was wrong to put a large pattern on the walls of a small apartment. That was a fallacy, for a bold pattern was not at all out of scale, if the colouring was properly proportioned with the design in a small room, whether on the walls or on the ceiling. Respecting friezes, he would like to see deeper ones produced, say from 2 ft. to 3 ft. in depth, and broad in treatment; this was a want which had not yet been met by manufacturers. Then again, on the question of colouring, formerly it would have been most difficult to get a client to accept a paper that had not a number of colours in it, while now they were content with one-print and two-print designs, which were frequently most effective. There was no doubt that there were designs and designs, and it was possible to be smitten with a pattern because of its colour, while the pattern itself was inherently bad. On the other hand, a good design might be spoiled by the colour, and that was a misfortune, because there were only a limited number of designers who could turn out really decent designs in



wall-papers. Some of the best designs had been produced from fabrics, but they, as architects, ought to demand that the manufacturer should give a better treatment of a more strictly architectural character. Flock-papers used to be condemned by sanitarians as unwholesome; but people were returning to them again. The manufacturers had wonderfully improved the designs for flock-papers. The use of a good flock-paper was perhaps about the best possible treatment for a ceiling. Hitherto designers had been afraid to attempt anything more than a small pattern for ceilings, but he would recommend the boldest patterns for that purpose, and they would be found much more effective than smaller designs. It was much to be regretted that, in spite of the general improvement in the wall-papers themselves, it was scarcely possible to find a man who could hang them properly. Indeed, paper-hangers as a class seemed to have greatly deteriorated in technical skill of late years. Architects should, if possible, only use block-printed papers, as the machine-papers were of a much inferior quality, and were certainly less effective. The best designs, too, were printed from the block, while only those that were to be sold in large quantities were printed by the machine. With regard to the imitation of materials, he was sorry to see Mr. Heaton coming out with papers in imitation of marble and mosaics. Surely, if marble was wanted, they had better go in for marble or mosaic itself, and not attempt to imitate it (applause).

Mr. Metford Warner (Jeffrey & Co.) said he had been very much interested with Mr. Pite's lecture, and as a manufacturer he might say Mr. Pite had given a fair explanation of the processes connected with the business. He should go away from the meeting certainly encouraged by the very kind way in which the art or craft of the paper-stainer had been spoken of, and he had been much struck with Mr. Pite's poetic expression as to wall-papers "forming the back-ground of our social life." It was a pity that so many designs for wall-papers were taken direct from the South Kensington Museum and fabrics generally. It seemed strange, with so many clever men, that they could not produce designs showing originality, and which, though based on lines or ideas derived from the past, should not be mere copies. Of course, there were the beautiful papers designed by Wm. Morris, Walter Crane, Lewis Day, and other strictly original designers; but it was a pity there should be so many merely "cribbed" from South Kensington. In fact, there was not a single piece of good work put in the galleries there that was not immediately copied, not merely by Englishmen, but also by Frenchmen and Germans (applause). With regard to machine-printed papers, it must be borne in mind that they were not so permanent as those printed by hand, for while the former merely received the colour as the paper momentarily came in contact with the printing-roller, the hand or block printed papers had the colour pressed into a ground of body-colour.

The Chairman (Mr. H. D. Appleton, President) remarked that Mr. Lewis Day would have been present that evening but for a country engagement which he could not set aside. He thought the thanks of the Association were due to the several manufacturers who had lent specimens of papers for exhibition that evening, and who had also many years exhibited at their *conversations* specimens of their beautiful wall-papers (applause). He would also like to explain that Mr. W. A. Pite, who was down to read a paper for that evening, entitled "Architecture in Oxfordshire," had been prevented doing so, and that his brother had kindly come forward in his place (applause).

The Chairman then put the vote of thanks, which was carried by acclamation.

Mr. Pite, in replying, mentioned his indebtedness to Messrs. Woolams, Morris, Heaton, Jeffrey, and Hayward, for the samples of wall-papers exhibited in the room. He might say that the "pulp" were useful when the architect had to paper new walls. As a matter of practice he found that lining papers were nearly always useful on such occasions. He could not help thinking that a printed lining-paper, which was cheap and economical, would be very useful; and he recommended "pulp" for that purpose, as being cheap and effective, and not cheap and nasty. Mr. Pite concluded by giving an interesting exhibition of sketching, showing how to design the common-square and drop patterns.

#### NEW WINDOW, STATIONERS' HALL.

THIS window, of which a sketch is subjoined, has been presented to Stationers' Hall by Mr. Joshua W. Butterworth, F.S.A., in celebration of his fiftieth year of association with the Company.



New Window, Stationers' Hall.

The window, which is dedicated to Shakespeare, may be thus briefly described:—On the central portion is displayed the figure of the poet. The authority for his features has been derived from the "Chandos Portrait," now in the Ellesmere collection. The signature of the poet at the foot of the figure is from a tracing of his own handwriting, attached to a deed in the possession of the Corporation. The motto, "He was not for an age, but for all time," it will be remembered, was composed by Ben Jonson, his friend and contemporary. Below are two medallions, which respectively represent the "Birthplace of Shakespeare," and the Parish Church of Stratford-upon-Avon. Between the medallions are inserted the arms of Shakespeare, and at the top of the window are represented the arms of the donor, who is responsible for the general composition of the window, which has been executed by Messrs. Mayer & Co.

**Presentation to a Borough Surveyor.**—A purse of seventy sovereigns and an address were presented, on Monday last, to Mr. G. R. Andrews, Town Surveyor of Bournemouth, on his departure, after eleven years' service in that town, to take the post of Borough Surveyor at Brighton.

**New Mission Church, Horselydown.**—The designs of Messrs. Newman & Newman, of Tooley-street, have been selected in a limited competition for the new Mission Church to be built in the parish of St. John's, Horselydown.

#### ARCHITECTURAL ASSOCIATION VISITS.

On Saturday last the members of the Association visited what was formerly the country village of Hornsey, but is now fast becoming a thickly-populated suburb of the metropolis. During the last five years especially, the population of the parish of Hornsey has enormously increased and the parish church of St. Mary has consequently become too small for present day requirements. To meet these requirements a new church is now in course of erection from the designs of Mr. James Brooks, which was illustrated in the *Builder* of May 12, 1888, and is now sufficiently advanced towards realisation to justify the expectation that this church will, when completed, be one of the finest in the North of London. The portion of the design which is already carried out comprises the whole of the nave and chancel with the aisles, transepts, and vestries, the tower, spire, and western porches being not yet commenced. Mr. Brooks, the architect, met the members of the Association, and, after showing them the contract drawings, the whole of which were hung up for the inspection of the visitors, conducted them over the building, explaining its chief features, and especially calling attention to the excellence and thoroughness of the work of the builders, Messrs. Rudall, Son, & Grantham. The visitors not only enjoyed the beauties of design they found in the building but were also much struck by the smallness of its cost, notwithstanding the wealth of detail and solidity of construction displayed. The walls internally and externally are entirely faced with Ancaster stone with an inner core of Portland cement concrete, while the roofs, which are wholly of pitch-pine, are Medieval in their scantlings.

It is to be hoped that funds will shortly permit of the completion of Mr. Brooks's design, with its fine western tower and spire and flanking porches, with parish room and library over them, in which latter records of the history of the parish may find a fitting place. Of this there is much that is interesting from the long connexion of the bishops of London with the locality as lords of the manor of Hornsey, or as it was formerly called until the time of Elizabeth, Haringey, a name still retained in Haringey-park, near Crouch-end.

The parish was also, in Medieval times, a place of pilgrimage, owing to the fame of the curative powers of "Our Lady of Muswell." The fate of the present church has not yet been decided, though it is to be hoped that the ivy-clad perpendicular tower, which bears the arms of Savage, who was Bishop of London from 1497 to 1500 A.D., and his more eminent successor Bishop Warham, may be spared, even though the more modern church erected in 1832 be pulled down. This latter has but small interest beyond being the burial-place of Samuel Rogers, the banker-poet, who was buried there in 1855.

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

At a meeting of this Association, held on the 21st inst., Mr. John Wallace read a paper on "Neglected Branches of Design." He referred to the absence of beauty in most of our industrial productions, even in those closely related to architecture such as necessary domestic fittings, grates, gasfittings, rain-water goods, wrought-iron work, furniture, and upholstery. Regret was expressed at the neglect of high-class decorative painting, and that in Scotland especially the class usually designated "artists" *par excellence* should carry their repugnance to conventional art to the verge of hostility. Brief reference was made to a largely neglected field of design in the dwellings of our working men, and even of the middle class. That was a branch of industry hardly influenced by the artistically educated members of the architectural profession, and there was small chance of improvement so long as that industry remained in the hands of jerry builders and unprincipled speculators. Hopes were expressed of the beneficial influence the forthcoming visit of the Art Congress to Edinburgh would have in strengthening the movement in favour of art as applied to industry.

On Saturday afternoon the members of the Edinburgh Architectural Association, along with a large contingent from the Glasgow Architectural Association, paid a visit to Mid-Caldor House, and also to the Old Parish Church, which, through the kindness of Lord Torphichen,



men and the Rev. Mr. Gardiner, were respectively thrown open for viewing. The party as conducted over the house by Mr. J. Harrison, who sketched the history of the Handlands family, so long connected with the house and the locality. The various apartments were examined, chief of which being that in which history relates John Knox to have dispensed the Sacrament of the Lord's Supper openly for the first time, in conformity with the practice of the Reformed Church in Scotland. Leaving the house, the party was next conducted over the Old Parish Church adjoining by Mr. Hippolyte J. Blanc. He explained that though the church now presented an edifice comprising choir and transepts, yet the only part of the original was the choir, the transepts having been added about thirty years ago. In alluding to the subject of their visit, Mr. Blanc referred to the characteristic features of Scotch ecclesiastical architecture of the period, and illustrated it by well-known examples. From studying the details of the edifice it might be concluded, Mr. Blanc showed, that the church was a foundation of about the middle of the fifteenth century; but documentary evidence showed that in 1542 Peter Handlands, then pastor of Calder Comitis, having laid the foundations of the "quair and vestrie of the Parochie Kirk of Calder," took an obligation from his nephew and grand-nephew to carry on and complete the fabric according to certain specified dimensions and style; and further, to build a nave at the west end with a steeple between it and the choir, and a "closter" on the north side of the choir, the roof of the choir to be of stone, groined in the same manner as that of Sanct Antonhis Yle, in Sanct Gelis Kirk. Whether from lack of funds or some other cause, that was carried out of the scheme was the choir, and even that part never had the roof completed in the manner specified. Mr. Blanc described the plan originally built as being a simple parallelogram, about 70 ft. long by 23 ft. wide, having a polygonal termination at the east end, abutting upon the east end is the vestry, which seems to have been provided for by the founder to enclose the family vault which is underneath. Externally the south front is divided into two side bays with heavy buttresses, which latter are also repeated on the angles of the apse, though not on the north side. The lighting is by means of large four-light windows, each occupying nearly the whole surface of each bay on the south side only, the mullions in each case arching out into the pear-shaped loop tracery so characteristic of Scotch ecclesiastical architecture of this period.

#### CASE UNDER THE METROPOLITAN BUILDING ACTS:

##### OPENINGS FOR LIFTS IN FIREPROOF FLOORS.

MESSES. SANDON BROTHERS, 79, Mark-lane, E.C., are summoned before Mr. Vaughan, at Bow-street Police-court, on March 13, by Mr. C. F. Hayward, District Surveyor of St. Giles's, Bloomsbury, for that they, being engaged in the erection of Tavistock Residential Chambers at the corner of Hart-street and Museum-street, Bloomsbury, "did erect separate sets of chambers not wholly divided horizontally by fireproof floors," also "did omit to continue the fireproof floors through spaces left for small lifts in sculleries of each floor." Mr. Hayward conducted his own case, and the defendants are represented by Mr. Morton, barrister, instructed by Mr. T. A. Jones, solicitor, of 79, Mark-lane. Mr. Hayward contended that the openings formed the floors to allow of the passage of the lifts were contravention of the Act, part I., sec. 27, sub. b. 2, which shortly says:—"That separate sets of chambers, tenanted by different persons, shall, contained in a building exceeding 3,600 super. ft. in area, be divided vertically up and horizontally by party-walls or fireproof floors." His objection was on the ground that there was a risk of fire communicated from floor to floor up the lift. Mr. Hayward was cross-examined by Mr. Morton showing that though the area of the whole buildings was 4,700 ft., they were divided vertically by party-walls, and that the area of each building was under 3,600 ft. Mr. Vaughan, having inspected the plans, said thought there was only one building, but indicated to Mr. Hayward that he was not satisfied that the rooms adjoined, and decided to adjourn the hearing of the case for a week, so as to give him an opportunity of inspecting the premises, and gave instruction that Mr. Hayward and Mr. W. Seckin, a Witherington, the defendant's architect, should meet him at the view. Mr. Vaughan having duly inspected the premises,

the case came on for hearing again on the 20th inst., when Mr. Hayward used arguments in support of his contention.

Mr. Vaughan, without calling for any evidence on behalf of the defendants, said that, having carefully inspected the premises, he was of opinion that, if there were any risk from fire, it was, from the position of the lifts (which were placed at the extreme ends of the buildings), reduced to an absolute minimum, and that, as the lifts were not either "chambers or rooms" within the meaning of the Act, the summons must be dismissed.

#### SOME ESSEX CHURCHES.

SIR,—Mr. Corder's brief reference to Aveley Church, in your issue of 23rd inst. [p. 225], serves to remind us of the fact how little Essex churches are known or appreciated, although, it is true, this county cannot boast of any very grand or important ecclesiastical buildings. Still, many of its remote village churches are not only of great antiquity, but of considerable ecclesiastical interest. More especially is this the case in the valley of the Thames, a district to which, as Mr. Corder remarks, stone could be easily transported. In the more central parts of the country this material was less easily procured, as the massive brick towers of Ingatstone, Fryerning, Billericay, the two Theydons, &c., testify.

The church at Aveley is of much greater age than is indicated by the sketch given in the issue referred to above, the southern arcade of the nave being of Early Norman date, with massive square piers, while the northern arcade is of later style, with pointed arches of perhaps the second half of the thirteenth century, to which period much of the chancel probably belongs. There are some very fair brasses preserved in the church, one dating from 1370, but externally the building is of little interest. Traces of Norman work are very common in the village churches of the district, a notable example is at Rainham, where the Norman interior, with its two arcades, *circa* 1135, remains practically unaltered, while the tower is mostly of the same date, but cased and buttressed at some more recent period. Then there are Norman doorways still remaining at Stifford (of a rude and early type), Orsett, South Ockendon (a fine example of the later Norman style), North Ockendon, &c., while at Little Thurock the church, recently restored, is of Norman foundation, and retains its original chancel arch; West Thurock church, too, displays considerable mixture of styles, a large part dating from the thirteenth century, and as the churchyard of this parish is partly bounded by the sea-wall, it affords us tolerably good proof of the fact that the work of embanking the Thames must have been completed, in this locality at least, prior to the period mentioned.

I hope Mr. Corder will give us some more of his "Wayside Notes." I, for one, shall look forward with interest to the next instalment.

London, March 25.

R. B.

#### NORMAN BRACKET IN EYNSFORD CHURCH.

SIR,—While last week at Eynsford Church (in Kent, and but a few miles from London), I met with a very remarkable and interesting feature, for the presence of which I can, I think, offer a fairly reasonable suggestion.

The object in question is a stone bracket of Norman date, projecting from the south wall of the chancel, some few feet west of the chord of the apse, and at about 7 ft. from the floor. Through this bracket is drilled vertically a round hole of about 1 in. in diameter, having its upper edge worn away in small channels to the north, apparently by a string or cord. Now, it seems to me that we may have here the perhaps unique example of a bracket through which hung down the cord used for the Lenten veil, and the following quotations go far, I think, to support this view.

From the preceding Saturday also until the Wednesday before Easter Day, a veil shall hang in the presbytery between the choir and the altar, which should be let down throughout Lent on week-days, when it is the ferial office, except whilst the Gospel is being read."—Register of St. Osmund of Salisbury, Rolls Series, p. 171.

Our bracket is some distance to the west of the apse, and between the piscina and choir proper.

"... where, as we know from the winch remaining, the Lenten veil hung."—Canon Jones, "On the Original Position of the High Altar at Salisbury Cathedral," Wiltshire Archaeological and Natural History Magazine, vol. xvii., 1877.

The last notice of the Eynsford bracket with which I am acquainted is the following, from the first volume of the Transactions of the St. Paul's Ecclesiological Society:—"In the south coign of the entrance to the apse there are two stones with Norman carving. One forms a projecting bracket, perforated with a large round hole, such as might be used to hold a candle, or many other things." Had the bracket been for the support of a candle it would not, I think, have been perforated, but the hole would have been sunk only sufficiently to form

a socket. The root of the question seems to me to lie in the fact of the channels worn in the edge, to see which it is necessary to attain some slight elevation, which probably the writer of the above (a very kind and able man) did not attempt.

Certainly the bracket may have been for the passage of the cord for the light hanging before the Host, or connected directly with the suspension of the Host, though for the latter purpose it is probably too far west. I think, however, that such evidence as we have is in favour of a connexion with the veil.

Clovelly, Bexley Heath.

HENRY LITTLEHALES.

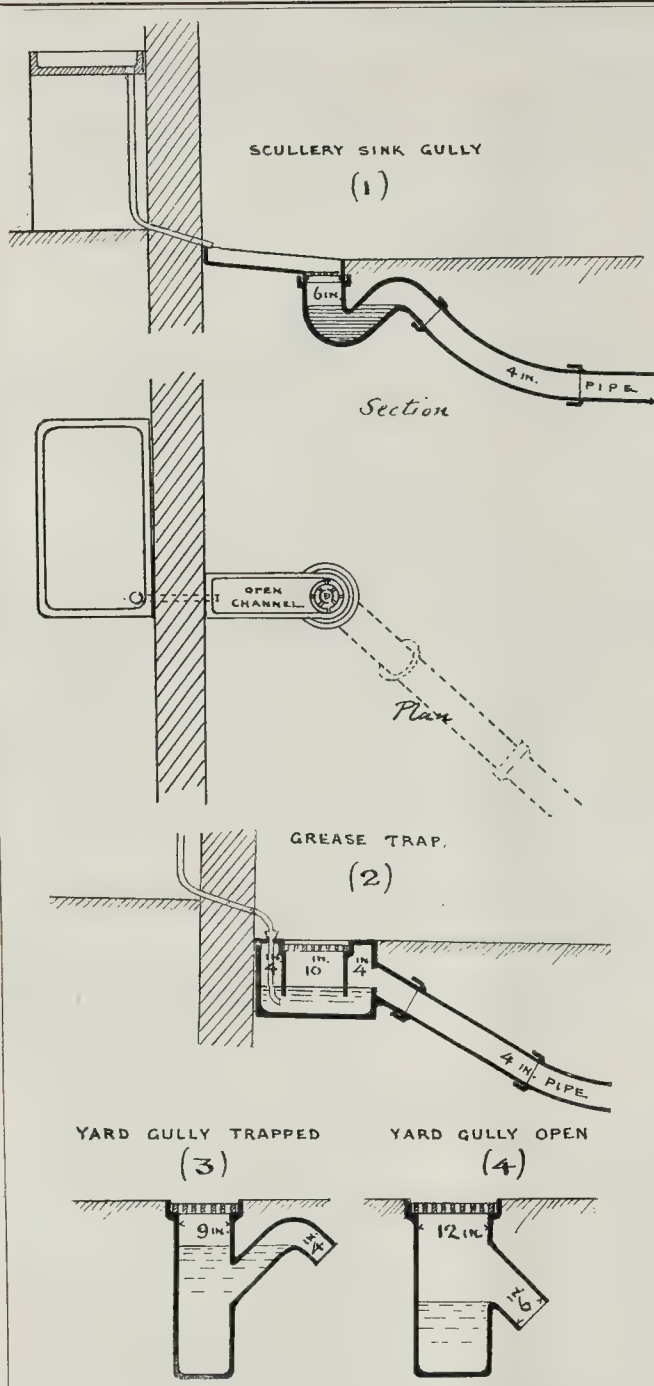
#### The Student's Column.

##### TOWN DRAINAGE.

##### XIII.—SEWAGE INLETS TO DRAINS.

ALL drains should terminate outside a house or any building inhabited either regularly or occasionally, except the one prolongation of the drain which conveys the air-current from the inlet to the outlet,—from, that is to say, the inlet in front of the house to the ventilating-pipe at the back; or reversely, if so determined in a particular case, from the inlet at the back of the house to the ventilating-pipe at the front. No other portion of a drain should terminate inside a house, notwithstanding that a trap be placed at its end with the intention of preventing foul air passing it. Many such traps and terminations still exist, but they must all be altered sooner or later, and there must be one outlet only, of sufficient size, at the head of the drain. Two ventilating-pipes, or air-outlet pipes, do not act so well as one, unless they are both of the same height. If there is more than one the air has a tendency to descend the shorter one and ascend the higher one, but it is a tendency only, and not effective in itself, while its action interferes with the course of the air from the proper inlet near the ground level, to the proper outlet as high as can be procured. There being then only one ventilating-pipe to each house-drain, its size should be almost, if not quite, as large as the drain itself; at least the ventilation is facilitated by making it so, and, seeing how slight the forces are with which we have to deal in this matter, it behoves us to afford every facility for so important a part of the work, and not to check the natural course of the air through the drains by offering to it the obstruction of a small pipe. For the same reason there should be as few bends as can be in the ventilating pipe, and none abrupt; and, moreover, care should be taken not to place anything upon the open end of the pipe which would obstruct the free outlet of air.

Every other branch of the drain terminates outside the wall, where a gully is placed at the surface of the ground, into which the waste water is discharged through a separate pipe. The gully is covered with an iron grating, and, in the case of the gully which receives the discharge of a scullery-sink, the discharge should be above rather than below the grating, a short open channel conveying it from the wall to the gully. A lead pipe, of at least 1 in. diameter (better larger), conveys the refuse of the sink through the wall. This, though unconnected with the drain, should have a bent trap immediately under the sink, as the sides of the pipe become foul and will emit a smell into the house unless thus trapped. Solid matter will accumulate in the bottom of this trap, but it can be removed occasionally through a hole in the pipe underneath, the hole being closed by a plug screwed in, but so as not to project inside the pipe. Proper traps of this kind are made ready to be joined above and below to the lead pipe. The gully outside is of earthenware, and for a scullery-sink should be of such a form as not to retain sediment. Its outlet should form a water-trap, so that air from the drain may not pass out through it. The branch of the drain leading to it should be as short as it can be made, for the same reason that the intercepting trap should be as near the sewer as possible, viz. that the air in that length must remain almost without movement, and it is only by slow diffusion that this stagnant air becomes mixed with the air current of the main portion of the drain, and so carried away to the outlet. These gullies are made 6 in. and 9 in. diameter, and some larger. They are also made square at the top—6 in. and 9 in. square inside—but round ones are better where it is required to turn the outlet in a direction oblique to the line of wall, and especially with branches so short as some of these



shown on the sketch-plans of the small houses in the article No. XI, and in some other situations yet to be referred to. The outlet of a scullery-sink gully is 4 in. diameter, and when the 4 in. branch to it has been laid nearly up to the gully, a bend pipe is turned upwards to receive the outlet. The depth of the drain sometimes requires that a straight pipe be inserted between the bend and the gully, or more than one, but the laying of the drain and

branch should be managed so as not to require these.

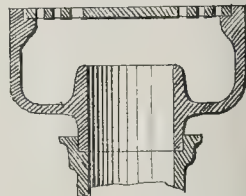
The surface of an open space of ground at the back of a house is formed with a slight inclination downwards to the gully which carries off the rain-water. This lowest point of the surface may sometimes be at the place where the scullery sink-gully is required to be placed, but this brings all the surface water towards the house. The gully for carrying off the rain-water

falling upon the open space is better placed farther away, either in the centre, if the area be large, or at the far side for small areas. This gully should be of different form to that which is proper for a scullery-sink gully, which receives no heavy kind of dirt, while the yard-gully receives sand and other heavy dirt which concretes upon the bottom of the drain, and is difficult to move along with the sewage; moreover, its delivery into sewers is objectionable. This gully should, therefore, be deeper and larger than other gullies. It resembles a street gully in catching heavy dirt. Where the ventilating-pipe is placed at the head of the drain at the back of the house this yard-gully should form also a trap to turn the current of air in the drain in the appointed direction (fig. 3). The outlet of this gully should be 4 in. diameter. When the position of the ventilating-pipe is reversed, and placed at the front of the house, the yard-gully should not be trapped, but formed to admit air freely to the drain (fig. 4). Its outlet should be 6 in. diameter, or of the full size of the main portion of the drain, and the aggregate area of the openings between the bars of the gratings should be 40 square inches.

With regard to the form of gully for a scullery sink, it should first be determined whether it is necessary to form with it a grease-trap. This is necessary in the case of large houses, but not in small ones, where fat is not so much wasted. Fig. 1 shows a common form of gully for these, which is sufficient, but if the gully is to catch and retain the fat discharged with the hot waste water from a scullery or kitchen sink of a large house, it is necessary to provide a middle space, as in fig. 2, in which the water is maintained in a quiet state to enable the fat to rise to its surface, and to contain such a body of water as to allow the hot water discharged from the sink to be sufficiently cooled to enable this separation to take place. Any large quantity of grease discharged freshly into a drain is objectionable; if it remain long enough in the gully to become broken up and altered in character, it is less so; but, on the whole, it is better to retain it in the gully and remove it from time to time.

The rain-water pipes from the roof should not be connected with the drain, but should deliver the water on the surface of the ground, or directly into a gully-trap. If they are connected with the drain they prevent the proper action of the ventilating-pipe erected for the special purpose of ventilation, whether it be a special pipe or the soil-pipe of a water-closet, besides having a tendency to bring up and discharge foul air near the upper windows. Where the open area of ground at the back of a house is small the rain-water gutters of the roof should be laid so as to deliver the water as near the head of the drain as can be conveniently; but if this be not so the water may run over the surface to the yard-gully in the lowest position, if it be a paved area.

\* In reference to the construction of air inlets in a roadway, mentioned in a former article, our attention has been drawn to the form of inlet patented by Mr. Cregheen, Surveyor to the Bromley Local Board, of the section shown



in the cut, which can be fixed level with the roadway, dirt or stones falling in being caught in the pan round the pipe-head\*. It is fitted with a hinged lid and a lock, for cleaning.

**Lifts.**—The new buildings for the Liverpool Royal Infirmary, which are being erected from the designs of Mr. Alfred Waterhouse, R.A., are to be fitted with three hydraulic lifts, viz., a direct-acting hydraulic passenger-lift for conveying patients in their beds, a dinner-lift, and a goods-lift for the administrative block. Mr. Waterhouse has placed the execution of the contract in the hands of Messrs. R. Waygood & Co., of London.

\* Made by Messrs. Stone & Co., Deptford.



## Books.

**Lockwood's Builders' and Contractors' Price-Book for 1889.** Edited by FRANCIS T. W. MILLER, A.R.I.B.A. (London: Crosby Lockwood & Son.)

THIS useful work quite keeps up its reputation for careful preparation and comprehensiveness. As usual in manuals of this class, the prices are liberal, and will bear considerable discount for average work. The short essays on construction are, in the main, well done and trustworthy. It is impossible to keep them quite free of controversial matter, and there are those who think the praises of concrete building too loud, and that much might be written *per contra*. One should not, perhaps, look for literary style in books of this description, still a little care would avoid such ambiguities as the following:—"The value of drains and sewers should be ascertained by their solid contents."

In one or two points the information has not been brought down to date, e.g., the late Mr. William's name occurs as the architect to the now defunct Metropolitan Board of Works, in some cases it is not quite accurate, e.g. (apropos of the Douling stone), Ilminster is not in Wiltshire but in Somerset, and the Douling stone is not found near Ilminster, but near Shepton Mallet, also in Somerset.

A more important matter is the omission to state the prime cost upon which the list of copper articles is based. The editor remarks that the price varies. It does, indeed!

**The Proposed Railway Classifications, with Comparative Tables of Maximum Rates and Charges.** By M. B. COTSWORTH. London: Waterlow & Sons. Price 2s. 6d.

THIS is precisely what was required to complete the work on this subject by Dr. Hunter, noticed in our issue of the 9th inst.,—in fact, it might almost be regarded as an appendix thereto. Here we have the proposed classification alphabetically arranged, and compared with that of the Railway Clearing House, all elevations being apparent at a glance. This is followed by a series of elaborate tables, by which the charge proposed by each company, under any class, and for any distance, can be readily ascertained. The fact that such a table has been compiled,—and that within a week or two of the publication of the classifications and schedules,—speaks volumes for the value of the new Act in this particular respect. It has hitherto, under the old Acts,—been simply impossible.

Probably with a view of saving time, the rates have been lithographed; but the figures are clear and bold, and the work is well executed. Of course, the present proposals are liable to alteration; but, when finally settled, a set of tables on similar lines will be of still greater service.

**The Patents, Designs, and Trade-Marks Acts, 1885 to 1888; consolidated.** With an index. By LEWIS EDMUNDS, Barrister-at-Law. London: Stevens & Sons; 1889.

THIS is a reprint in large type, and with a sufficiently durable binding, of the original text of the Act of 1883, the repealed portions printed in italics, and the additions and alterations added in large type, and the text of the amending Acts of 1885, 1886, and 1888, has been added in the appropriate places, so that, as the editor says in his preface, "the principal Act as written into it all the amendments now in force," and the reader has the existing law on the subject collected in a convenient and compact form. A very copious and detailed index is added, and the book will be a very useful consulting volume for those who have practical occasion to make themselves acquainted with legislation on patents and trade-marks.

**New Theatre at Coventry.**—The New Royal Opera House, at Coventry, was opened on Monday last. We gave a brief description of the building in the *Builder* for September 22 (p. 220). The internal decorations, which have been carried out by Messrs. Goodall & Co., of Liverpool, from the designs of the architects, appear to have given much satisfaction. The interior ceiling is dome-shaped, and divided into compartments and panels, with richly decorated and moulded ribs, each panel being filled with modelled designs. The architects are Messrs. Essex & Nicol, of Newhall-street, Birmingham, and Mr. Gray Hill, of Coventry, as the contractor for the buildings.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

4,525, Endless Band-saw. F. Parker.

Between the two large pulleys of an ordinary machine, on which the endless band-saw or knife runs, the inventor places a third pulley, coned or tapered on the edge, revolving on its own shaft and forced against and between the two large pulleys by means of a screw, a spring, or a weight. This third centre pulley reduces friction in the bearings of the two larger ones.

4,526, Pneumatic Apparatus for Dressing Stone. J. Mann.

Instead of the ordinary reciprocating movement only being used, a rotary motion is by this invention imparted to the cutter by mechanical means. The spindle and tool-holder reciprocates and revolves, but if it should be desired to cause the tool to reciprocate without revolving, a feather or catch is withdrawn, and leaves the spindle unrotated.

4,782, Window-fasteners. W. K. Booth.

According to this invention, a lever or hase, somewhat similar to the ordinary fastener, is employed, each lever being centred either upon the frame of one of the sashes, or upon the fixed window or door frame, and sweeping over a portion of the other sash. At its free end the lever carries a screw, the outer end of which is formed with a suitable thumb-nut or milled head. The bracket against which the screw abuts is formed with a suitable slot, into which the lever enters when swung into position for fastening, and it may have a recess into which the end of the screw shall enter when it is rotated in the direction for fastening the sash. The action is that when the window or door is closed, the lever is swung into position over the sash, and the screw immediately tightened down, when the sash or door is drawn close to its companion sash or to its frame, thus excluding draughts and preventing rattling.

5,881, Manufacture of Cement. A. McCra.

This invention has for its object the hastening of the cooling or maturing process, the cement being passed through apparatus specially designed, and also to produce an improved cement by admixture with the ordinary materials of a proportion of carbonate of lime, either while the cement is passing through the cooling-machine or before or after such passage. The cooling apparatus consists of a cylinder or trunk within which is a series of shelves, each shelf having in it a series of holes inclined downwards from the circumference of the cylinder towards the centre. Through the centre of the cylinder passes a pipe which is perforated, and through which passes a constant current of air.

1,123, Improvements in Fire-grates. W. H. Prestwich.

In order to fully radiate the heat, a number of louvers are, according to this invention, placed at the back of the stove, which louvers may be opened or closed at will. A ratchet motion controls the opening and closing. A permanent opening is formed up over the back of the stove to carry off the smoke and products of combustion.

## NEW APPLICATIONS FOR PATENTS.

March 11.—4,220, W. Smith, Sewer and House Drain-traps.

March 12.—4,269, R. Wyatt, Silent-action Ball-valve.—4,283, F. Hayward, Wedge-block to keep Pan-tiles rigid on Roofs.—4,285, G. Marsden, Ornamental Tiles, Bricks, &c.—4,286, J. Winkell, Jun., Kiln for Burning Limestone.—4,326, J. Fryer, Extracting Cowl or Ventilator.—4,346, W. Popplewell, Saw-sets.—4,347, J. Homan, Fire-proof Structures and Bricks for same.

March 13.—4,378, F. Abbey, Fireplace and Chimney.—4,392, T. Cooper, Fireproof Floor or Roof Construction.—4,395, B. Busse, Ventilating Buildings.

March 14.—4,432, W. Ingle, Hanging Sliding Window-sashes.—4,434, A. Guerra and D. Stefano, Door-fasteners.—4,436, W. Pridoux, Window-fasteners.—4,437, W. Pridoux, Screws.—4,438, T. Houghton, Chimney-pot, &c.

March 15.—4,522, T. Page, Glazing-bars for Roofs, &c.—4,524, C. Shewbrooks, Weather-proof Combination Tile, &c.

March 16.—4,538, F. Lane, Sawing Machinery.—4,543, W. Dunn, Fire-grates.—4,550, W. Hes, Decorative Compositions.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

1,281, A. Hewson and S. Bradley, Window-sash and Casement Fastener.—1,952, J. Merryweather, Paving.—2,134, H. Enoch, Water-waste Preventers for Water-closets, &c.—2,865, J. Kerr, Stencil-holder for Painters and Decorators.—2,520, W. Davidson, Eaves Gutter Hooks, &c.—2,523, J. Taylor, Binding Bricks for Hollow Walls, &c.—2,530, C. Hickton, Cupboard Door Fastener.—2,602, A. and J. Gilbert, Chimney-pots.—2,798, J. Stansfield, Machines for Mixing Concrete.—2,817, W. Laycock, Opening, Closing, and Securing Window-sashes, &c.—2,827, W. Williams, Wood Paving.—2,885, T. Harries and J. Douglas, Machine for Grinding and Polishing Marble, &c.—3,017, F.

Baker and I. Cohen, Cupboard and Door Fastenings.—3,063, J. Thompson and J. Kirby, Cup-and-ball Gas-joints.—3,295, J. and W. Catterall, Fire-grates.—3,563, H. Lord, Water-closets.—3,580, P. Barry, Electric Bell or Gong.—3,668, T. Salter, Flushing Apparatus, &c.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

6,422, J. Freebury, Decorations in Stone and Marble.—6,690, H. Buignet, Testing Cements, &c.—6,759, P. Lucas, Step-ladders.—6,965, J. Brindley, Gully-traps.—7,132, G. Lock, Air Inlet for Ventilating Drains, &c.—7,190, J. Cropper, Flushing Water-closets.—7,288, J. Phillips, Gullies and Agency Doors for Theatres, &c.—13,839, W. Dickson and R. Barr, Stoves, &c.—17,752, W. Miller, Floor Ventilator.—2,049, H. Young, Machine for Cutting Stone, &c.—2,547, E. Lisle, Chimney-cowl.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

[Contractions used in this list.—"g.r." for "ground-rent"; "ys." for "years"; "st." for "street"; "rd." for "road"; "sq." for "square"; "pl." for "place"; "ter." for "terrace"; "yd." for "yard," &c.]

MARCH 18.—By GLOVER & HARRISON.

Camden Town—37, Lynton-st., 51 ys., g.r. £360  
By E. Wood  
Peckham—4 and 5, Hazel-ter., 73 ys., g.r. £11. 8s. 410  
5, Langdale-rd., 66 ys., g.r. £5. 5s. 316  
Bermondsey—340 to 350 even, Southwark Park-rd., 54 ys., g.r. £25. 600  
Norwood—14 to 32 even, Cambridge-st., freehold. 2,010  
Bloomsbury—19, North Keppel-mews, 123 ys., g.r. £8. 12s. 330  
Clapton—25, Thirlaw-st., 64 ys., g.r. £3. 6s. 395  
Fulham—22, Fulham Park-gardens, 89 ys., g.r. £7 210  
Waterloo-road—24, Oakley-st., 24 ys., g.r. £10 285

MARCH 19.—By PROTHRO & MORRIS.

Manor Park—3 to 9, Elizabeth-ter., 98 ys., g.r. £4 600  
By C. G. COLLS & Co.  
Baywater—An improved ground-rent of £22, term 43 ys. 410  
By HENRY & LATCHWOOD.  
Clapham—82, Manor-st., freehold 465  
1, Caroline-pl., 70 ys., g.r. £1. 400  
Chelsea—111, Sydney-st., 20 ys., g.r. £12 630  
Stockwell—37 and 38, Wellington-rd., 56 ys., g.r. £10 400

By G. BRIDGLEY.

Notting Hill—72 and 78, Silchester-rd., 75 years, g.r. £12. 2s. 405  
Rusholme—Two copyhold cottages 150

By CHARLES & TUBBS.

Old Kent-road—27 to 49 odd, King Arthur-st., 68 ys., g.r. £48. 3s. 1,665

By MR. TYDENMAN.

Fonder's End—1 to 4, Dunning-ter., 95 ys., g.r. £17 800  
MARCH 20.—By G. PLACE & SONS.  
Holloway—40 to 48 even, Wellington-rd., 58 ys., g.r. £30 1,450  
8, Hollingsworth-st., 55 ys., g.r. £2 305  
Canonbury—36, Northampton-st., 28 ys., g.r. £24. 275

By FARRBROTHER, ELLIS, & CO.

Baling—Broadway, a plot of land, 5s. 0r. 36 p., freehold 3,000  
Warwick-rd., Kerrison Lodge, freehold. 600  
Two plots of freehold land, 2a, 2r. 14p. 1,300  
The Park, ground-rents of £16. 6s. reversion 55 ys. 380  
The Park, ground-rents of £13. 13s. 10d., reversion 60 ys. 330  
The Park, ground-rents of £46. 10s., reversion 62 ys. 1,075  
The Park, ground-rents of £23, reversion 68 ys. 70

MARCH 21.—By DYER, SON, & HILTON.

Lee—16, Dorville-rd., 66 ys., g.r. £10. 770

By WALKER & RUNTS.

Gray's-inn-road, "Elm-street"—A plot of freehold land, area 20,760 ft. 5,700  
The letting on lease for 80 yrs. of 20 plots of land, g.r. 367 ft., at £1,071 per annum.

Hampstead, Heath-street—The letting on lease for 80 yrs. of 4 plots of land, area 3,360 ft., at £37 per annum.

By FLEWETT & SONS.

Regent's-park—60, Robert-st., 34 ys., g.r. £7. 437

By NEWBORN & HARDING.

Barnebury—56, Ellington-st., 63 ys., g.r. £8 415  
Islington—35, William-st., 67 ys., g.r. £5. 210  
"The Islington Club," freehold 1,000  
Camden-road—188, Brecknock-rd., 61 ys., g.r. £12 860  
Kingsland-road—No. 213, term 54 ys., g.r. £24. 650  
Horseay—1 and 4, Church-lane, 93 ys., g.r. £18. 1,025

By E. & S. SMITH.

Clerkenwell—35, 37, and 39, Warner-st., freehold. 1,325  
41, Warner-st., freehold beer-house 620

King's-cross—43 and 45, Wicklow-st., 68 ys., g.r. 425

Pentonville—23, Baker-st., 19 ys., g.r. £16 105

By F. J. BISLEY.

Bermondsey—12, Keaton's-rd., 51 ys., g.r. £5. 270  
56 and 58, Keaton's-rd., 57 ys., g.r. £8 545  
33, Trauton-rd., 57 ys., g.r. £3. 17s. 305  
Rotherhithe—9, Rotherhithe-pl., freehold. 95  
7, Rebecca-ter., 71 ys., g.r. £4 270  
57, Hawkstone-rd., 61 ys., g.r. £3. 10s. 330  
23, Irwell-pl., freehold 105  
39, 41, and 43, Rindon-st., freehold 200  
91, Clarence-st., freehold 200  
17, Love-lane, freehold 255  
3 and 4, Love-lane, freehold 400  
Deptford—36, Windmill-ls., 73 ys., g.r. £4 230



## MEETINGS.

**SATURDAY, MARCH 30.**  
*Royal Institution.*—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." VI. 8 p.m.

**MONDAY, APRIL 1.**  
*Surveyors' Institution.*—Mr. G. Beken on "The Rating of Ground-Rents." 8 p.m.  
*Society of Engineers.*—Mr. G. M. Lawford on "Fire-proof Floors." 7.30 p.m.  
*Clerks of Works Association (Carpenters' Hall).*—Annual Meeting. 8 p.m.  
*Royal Institution.*—General Monthly Meeting. 6 p.m.  
*Society of Arts (Casualty Lectures).*—Mr. C. V. Boys, F.R.S., on "Instruments for the Measurement of Radiant Heat." II. 8 p.m.

**TUESDAY, APRIL 2.**  
*Builders' Clerks' Benevolent Institution.*—Annual Dinner, Holborn Restaurant. 6 p.m.  
*Institution of Civil Engineers.*—(1) Further Discussion on Dr. C. E. Emery's Paper on "The District Distribution of Steam in the United States." (2, time permitting), Sir Nathaniel Barnaby on "Armour for Ships." 8 p.m.  
*Society of Arts (Foreign and Colonial Section).*—Mr. F. K. Smythies on "The Argentine Republic." 8 p.m.  
*Society of Biblical Archaeology.*—8 p.m.  
*Sanitary Institute (Lectures for Sanitary Inspectors).*—Mr. S. F. Murphy, on "Infectious Diseases and Methods of Disinfection." 8 p.m.  
 \* (Glasgow Architectural Association.—Mr. J. A. Campbell on "Neo-Greek Architecture." 8 p.m.)

**WEDNESDAY, APRIL 3.**  
*British Archaeological Association.*—A paper prepared by the late Mr. J. Brent, F.S.A., will be read on "The Burial Customs of the Nations of Antiquity." 8 p.m.  
*Civil and Mechanical Engineers' Society.*—Mr. J. Bateman on "The Roadstones of Somerset and Wilt." 7 p.m.  
*Builders' Foremen and Clerks of Works' Institution.*—Ordinary Meeting. 8.30 p.m.

**THURSDAY, APRIL 4.**  
*Royal Institution.*—Professor J. H. Middleton, M.A., on "Houses and their Decoration from the Classical to the Medieval Period." III. 8 p.m.  
*Royal Archaeological Institute.*—(1) Rev. Precentor Venables on "A Silver Chalice and Paten, and Gold Ring lately found in the Tomb of Bishop Sutton at Lincoln." (2) Mr. J. Bain on "Fougeres and its Lords, a reminiscence of Feudal Brittany." 4 p.m.  
*Society of Antiquaries.*—8.30 p.m.  
*Edinburgh Architectural Association.*—Dr. Joseph Anderson on "Celtic Art and Architecture in Scotland." 8 p.m.

**FRIDAY, APRIL 5.**  
*Architectural Association.*—Mr. Lacy W. Ridge on "Ruins and its Architecture." 7.30 p.m.  
*Sanitary Institute (Lectures for Sanitary Inspectors).*—Mr. J. F. J. Sykes, B.Sc., on "General Powers and Duties of Inspectors of Nuisances: Method of Inspection." 9 p.m.  
*Institution of Civil Engineers (Students' Meeting).*—Mr. R. J. Duxley, B.Sc., on "Moulding and Casting Cylinders for Marine Engines." 7.30 p.m.

**SATURDAY, APRIL 6.**  
*Association of Public Sanitary Inspectors.*—Mr. C. MacMahon on "The Selected Candidate."  
*Royal Institution.*—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." VII. 8 p.m.

## Miscellaneous.

**Roath Park, Cardiff.**—The Corporation of Cardiff recently offered a premium of 75l. for the best design for laying out 130 acres of land, which the Marquis of Bute has presented to the town of Cardiff for a public park. The Parks Committee have awarded the premium to the plans sent in by Messrs. William Barron & Son, Landscape Gardeners, Borrowash, near Derby. The site of the proposed park is a valley nearly two miles in length, with a considerable stream running through it, which will be utilised by Messrs. Barron & Son in the formation of a lake about thirty acres in extent, besides numerous smaller lakelets and waterfalls. Ample provision has been made for outdoor games, such as cricket, football, lawn-tennis, bowls, archery, &c., and an open-air swimming-bath and gymnasium are also provided. Designs are also furnished for a large refreshment pavilion, lodges, greenhouses, band stands, rustic shelters, &c. The approximate estimate of cost is 11,551l. 15s. 9d. This sum does not include fencing, the formation of the large lake, nor the roads surrounding the park, which items will be let in a separate contract.

**The New Factory and Offices for Messrs. Francis & Co.** engineers and revolving shutter and brass shop-front manufacturers, were opened last Monday, on which occasion a large party of friends and customers dined at Wood's Hotel, Farnival's Inn. The building occupies a prominent position on the east side of Gray's Inn-road, near the site of their old factory, burnt down some five years ago. The building occupies a ground-space of 6,200 ft., and is four floors high. It is executed in red Suffolk brickwork with Portland stone dressings, the window openings being fitted with Eiseley's iron casements. Mr. B. E. Nightingale, of Albert Embankment, carried out the works, from the designs and under the superintendence of Mr. Walter Graves, A.R.I.B.A., Mr. Buckle acting as clerk of works.

**New Method of Hollow Building.**—A Scandinavian architect, Herr J. Grude, writes as follows in a Danish contemporary on a method of hollow brick wall building in vogue in Denmark:—"In order to save materials, and prevent the penetration of moisture to the inner surface of walls, it is generally known that the custom has prevailed of making the walls hollow, the inner and outer brick wall being separated by a few inches, and connected at certain intervals by bonding stones. However, this mode of building does not entirely obviate the difficulty referred to, the bonding stones often acting as moisture conductors, although in a much smaller degree than the solid brick wall. To overcome this drawback, and isolate the outer and inner wall completely, Danish builders some years ago hit upon the idea of using steel wire frames for connecting the walls, and which has proved most effective. The mode of building is as follows: The brick walls of the building having been well isolated from the stone foundations by means of a layer of asphalt or felt, the inner, as well as the outer, wall is built up of half-bricks, with a space between of from 4 to 6 in. The thickness of the wall will thus be from 13 to 15 in. Then, at every third layer of bricks with a horizontal distance of four bricks, or 3 ft., a row of steel wire cube-shaped clamps are inserted, which, however, must not be closer to either wall than 1 to 1½ in. The clamps are pressed into the soft mortar by the overlying bricks, and thereby become fixed between the walls. In this manner an unbroken stratum of air is left between the two walls, and, as the steel wires do not act as moisture conductors, the inner wall is for all practical purposes isolated. For the making of the clamps galvanised steel wire, from 3 to 4 mm. in thickness, is used, the wire being formed into a cube by being twisted around wooden pegs at each corner, the latter being drawn out subsequently."

**The English Iron Trade.**—Although in the past week the English iron market has not, on the whole, been displaying the same amount of activity noticed recently, its tendency is still upwards. Pig-iron generally is quieter, makers being mostly well sold forward. They are, in consequence, stiffer in their prices, and some further advances are noted this week. Scotch makers, in a few instances, are quoting higher; Cleveland pig has been put up a trifle; Lancashire, Derbyshire, and Lincolnshire irons are from 6d. to 1s. dearer; while Bessemer descriptions, in which trade continues very brisk, is quoted about 1s. a ton more, with a further upward move within sight. Old materials are partaking of the rise in pig-iron. Manufactured iron is in very pressing demand in Scotland and the North of England, and prices may be given as 2s. 6d. a ton in advance of those quoted last week. There is an increasing weight of business coming forward in Lancashire. The inquiry for tin-plates is fairly good, and the market is tolerably firm. There is even more pressure in steel than in finished iron, and works can scarcely meet the call there is for the material. Steel boiler-plates have been advanced another 2s. 6d. a ton in Scotland. Shipbuilders are now doing about a maximum of work, but there are fewer fresh inquiries. Engineers continue very busy, but ironfounders are slack.—*Iron.*

**St. George's Church, Lisbon.**—This church, which has been rebuilt after its complete destruction by fire three years ago, was consecrated on Sunday, the 17th inst., by the Bishop of Gibraltar, the Diocesan. The building, which is cruciform, and in the Romanesque style, has a semicircular apsidal chancel, lighted by three lancet windows, and covered by a wagon roof. The nave and transepts have high-pitched open woodwork roofs, and are lighted by thirty-three windows, sixteen of which have double lights and graceful stone tracery. A peculiar feature of the western front is a projecting baptistery, faced by three stories of pillared arches. On each side of it stands an open cloistered porch, and the corbelled arcading above the baptistery is pierced by a massive wheel window contributed in 1887 as a memorial of the Queen's Jubilee. The stained windows and the many variegated marbles with which the interior is enriched, and almost all the fittings other than the benches, were contributed by individual members of the congregation. The total cost has been within a fraction of 10,000l. Messrs. Medland & Powell were the architects.—*Times.*

**British Archaeological Association.**—At the meeting held on Wednesday, the 26th inst., Mr. Allan Wyon, F.S.A., in the chair, it was announced that the annual congress would be held at Lincoln at the end of July, and that the Earl of Winchelsea and Nottingham had been elected President of the meeting. Various exhibitions were made, among which may be noted an interesting example of Roman Caistor ware belonging to Mr. Loftus Brock, F.S.A., who described its features. The first paper was by Miss Russell, of Galashiels, on the Early History of Cumbria and the etymology of the name of Glasgow, the latter being Glas = church, and gow = friend. Reference was made to some other place-names—such as Glastonbury—which have the same signification, and the "friend" was St. Mungo. It was shown that the ancient diocese of Glasgow was equal in extent to the kingdom of Cumbria, which extended to the boundary bank, the Catrail, or "battle fence" in Welsh, which was the boundary between Cumbria and Bernicia. Celtic names occur along the line of coast rather than among the hills, and it was suggested from many evidences that the Lowland Scots were of Cymric type. The second paper was by Mr. H. Syer Cuming, F.S.A. (Scott.), on "The Devil's Finger- and Toe-nails." This was an interesting chapter on folk-lore, in which many curious legends and beliefs were discussed. The well-known and common fossil, so-called, supposed to be either the shed finger- or toe-nails of the arch enemy of mankind, are popularly believed to shield their fortunate possessors from all harm.

**An Automatic Window-lock.**—This window-fastener which is called "Evans's Patent," presents some novelty and ingenuity. It is fixed on the side bar of the upper sash just above the meeting-rail, and not in the usual position on the centre of the meeting-rail, and is therefore more out of the way of being got at from without. When fixed it locks the window, a projecting brass bolt lying on the meeting-rail of the lower sash, so that neither sash can be moved. When it is required to open the window, a flush brass lever on the upper part of the bolt is pulled out, which pulls in the holding-bolt; but as the lower sash is lifted the meeting-rail strikes the projecting lever and sends the bolt back to its original position. When the sash is lowered the bolt, which is bevelled on the upper side and has a small roller on its outer extremity, is struck back by the meeting rail in passing, but immediately returns by the agency of a spring to its former position, holding the sash down. The same operation takes place if the lower sash be left stationary and the upper one lowered. The main point in the invention is that, on opening the window after releasing the bolt, the latter automatically sets itself in position for operating whenever the sash is closed, so that the window cannot be carelessly left unfastened. The invention has of course the inherent weakness of all mechanism which depends on the action of a spring, but so long as the spring retains its power the action is complete, and very simple and effectual for its purpose.

**The "Crystal" Glass Insurance Company, Limited.**—The first general meeting of the above-named company was held at the registered offices, 31, Bedford-street, Strand, London, W.C., on Friday, the 22nd inst. The Chairman, Mr. Stanley G. Bird, said that the Secretary had prepared a rough statement of the financial position of the company, which he thought the members would consider satisfactory, bearing in mind that the company had only been at work a little over two months. A considerable number of policies had been issued already, and he hoped the agents would continue to exert themselves. Mr. Herbert H. Bartlett (Perry & Co.) and Mr. Joseph Randall (Kirk & Randall) having spoken, the proceedings terminated, after some formal business had been transacted.

**St. Stephen's, Vienna.**—In a paragraph on January 26 of this year we referred to the state of the Church of St. Stephen at Vienna, and the necessity for repairs which had arisen, it was said, in consequence of the employment of inferior cement in certain portions of the building. From a special report of Dr. Michaelis of Berlin on the subject, it appears that the cement used in St. Stephen's was the best English Portland cement manufactured at that time, but that the cement was used neat, without sand: and Dr. Michaelis attributes to this the failure in the portions where cement was used.



**Evening Classes for Plumbers' Apprentices.**—A sub-committee of plumbers, appointed by the Plumbers' Company, met on the 20th inst. at the Anchor Institute, Notting-hill, to inspect the arrangements made there for holding evening classes for plumbers' apprentices, and also to consider arrangements for a general meeting of the plumbers of the Western District of London, with a view to facilitate the working of the registration system in that locality. Messrs. John Smeaton, W. H. Webb (master plumbers), and R. J. Lyne, J. Browning, and W. Smith (members of the United Operative Plumbers' Association) were present.

### PRICES CURRENT OF MATERIALS.

| TIMBER.                                | £. | s. | d. | 2. | s. | d. |
|----------------------------------------|----|----|----|----|----|----|
| Greenheart, B.G. .... ton              | 6  | 10 | 0  | 9  | 10 | 0  |
| Yak, E.L. .... foot cube               | 10 | 0  | 0  | 13 | 0  | 0  |
| Loguio, U.S. .... foot cube            | 0  | 2  | 0  | 0  | 0  | 0  |
| ash, Canada, .... load                 | 3  | 10 | 0  | 3  | 0  | 0  |
| Birch, .... load                       | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm, .... load                         | 2  | 0  | 0  | 5  | 0  | 0  |
| Fir, Danisco, &c. .... load            | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak, .... load                         | 2  | 10 | 0  | 4  | 10 | 0  |
| Pine, Canada red, .... load            | 3  | 5  | 0  | 4  | 0  | 0  |
| Pine, Canada yellow, .... load         | 3  | 10 | 0  | 5  | 10 | 0  |
| Oak, Danisco, .... fathom              | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg, .... load              | 5  | 10 | 0  | 6  | 10 | 0  |
| Wainscot, Riga, &c. .... log           | 2  | 15 | 0  | 4  | 5  | 0  |
| Oak, Odessa, crown, .... load          | 0  | 0  | 0  | 0  | 0  | 0  |
| Boards, Finland, 2nd and 1st, std. 100 | 9  | 10 | 0  | 11 | 0  | 0  |
| Riga, .... load                        | 7  | 10 | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow, .... load  | 11 | 10 | 0  | 15 | 0  | 0  |
| Pine, 2nd, .... load                   | 10 | 0  | 0  | 11 | 0  | 0  |
| St. Petersburg, .... load              | 8  | 10 | 0  | 10 | 0  | 0  |
| Swedish, .... load                     | 9  | 0  | 0  | 16 | 0  | 0  |
| White Sea, .... load                   | 9  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st, .... load           | 16 | 0  | 0  | 28 | 0  | 0  |
| Pine, 2nd, .... load                   | 11 | 0  | 0  | 10 | 0  | 0  |
| Pine, 3rd, &c. .... load               | 8  | 0  | 0  | 10 | 0  | 0  |
| Spruce, 1st, .... load                 | 9  | 10 | 0  | 11 | 0  | 0  |
| Pine, 2nd and 2nd, .... load           | 7  | 10 | 0  | 9  | 10 | 0  |
| New Brunswick, &c. .... load           | 8  | 15 | 0  | 9  | 10 | 0  |
| Mattens, all kinds, .... load          | 6  | 10 | 0  | 20 | 0  | 0  |

### TIMBER (continued).

|                                                    | £. | s. | d. | 2. | s. | d. |
|----------------------------------------------------|----|----|----|----|----|----|
| Flooring Boards, sq., 1 in., prepared, First, .... | 0  | 11 | 0  | 0  | 14 | 6  |
| Second, ....                                       | 0  | 8  | 0  | 0  | 10 | 9  |
| Other qualities, ....                              | 0  | 5  | 0  | 0  | 7  | 9  |
| Cedar, Cuba, .... foot                             | 0  | 0  | 44 | 0  | 0  | 44 |
| Honduras, &c. ....                                 | 0  | 0  | 4  | 0  | 0  | 44 |
| Mahogany, Cuba, ....                               | 0  | 0  | 44 | 0  | 0  | 44 |
| St. Domingo, cargo average, ....                   | 0  | 0  | 44 | 0  | 0  | 44 |
| Mexican, ....                                      | 0  | 0  | 44 | 0  | 0  | 44 |
| Tobacco, ....                                      | 0  | 0  | 54 | 0  | 0  | 44 |
| Honduras, ....                                     | 0  | 0  | 84 | 0  | 0  | 44 |
| Rose, Turkey, .... ton                             | 4  | 0  | 0  | 12 | 0  | 0  |
| Rose, Rio, ....                                    | 15 | 0  | 0  | 23 | 0  | 0  |
| Bahia, ....                                        | 14 | 0  | 0  | 18 | 0  | 0  |
| Satin, St. Domingo, .... foot                      | 0  | 0  | 6  | 0  | 1  | 3  |
| Porto Rico, ....                                   | 0  | 0  | 9  | 0  | 1  | 3  |
| Walnut, Italian, ....                              | 0  | 0  | 44 | 0  | 0  | 44 |

### METALS.

|                                  |    |    |   |    |    |   |
|----------------------------------|----|----|---|----|----|---|
| Iron—Bar, Welsh, in London, ton  | 5  | 5  | 0 | 5  | 10 | 0 |
| " " at works in Wales, ..        | 4  | 15 | 0 | 5  | 0  | 0 |
| " " Staffordshire, in London, .. | 5  | 10 | 0 | 6  | 10 | 0 |
| COPPER—                          |    |    |   |    |    |   |
| British, cake and ingot, ton     | 45 | 0  | 0 | 46 | 0  | 0 |
| Best selected, ..                | 47 | 0  | 0 | 49 | 0  | 0 |
| Australian, ..                   | 0  | 0  | 0 | 0  | 0  | 0 |
| Chili, bars, ..                  | 41 | 0  | 0 | 42 | 0  | 0 |
| YELLOW METAL—                    |    |    |   |    |    |   |
| LEAD—Pig, Spanish, ..            | 0  | 0  | 0 | 0  | 0  | 0 |
| English Ingots, ..               | 0  | 0  | 0 | 0  | 0  | 0 |
| Sheet, English, ..               | 13 | 10 | 0 | 14 | 0  | 0 |
| SILVER—                          |    |    |   |    |    |   |
| Silesian, special, ..            | 17 | 2  | 6 | 17 | 5  | 0 |
| Ordinary brands, ..              | 17 | 0  | 0 | 17 | 2  | 6 |
| TIN—                             |    |    |   |    |    |   |
| Straits, ..                      | 94 | 0  | 0 | 0  | 0  | 0 |
| Australian, ..                   | 95 | 5  | 0 | 0  | 0  | 0 |
| English Ingots, ..               | 26 | 5  | 0 | 0  | 0  | 0 |
| ZINC—English sheet, ..           | 21 | 0  | 0 | 22 | 0  | 0 |

### OILS.

|                            |    |    |   |    |    |   |
|----------------------------|----|----|---|----|----|---|
| Linseed, .. ton            | 18 | 5  | 0 | 18 | 10 | 0 |
| Cocount, Coochin, ..       | 27 | 0  | 0 | 23 | 0  | 0 |
| Ceylon, ..                 | 25 | 10 | 0 | 25 | 15 | 0 |
| Palm, Lagon, ..            | 24 | 0  | 0 | 0  | 0  | 0 |
| Rapeseed, English pale, .. | 28 | 10 | 0 | 0  | 0  | 0 |
| " " brown, ..              | 27 | 0  | 0 | 0  | 0  | 0 |
| Cottiseed, refined, ..     | 26 | 5  | 0 | 0  | 0  | 0 |
| Tallow and Oleine, ..      | 19 | 0  | 0 | 45 | 0  | 0 |
| Lubricating, U.S., ..      | 5  | 0  | 0 | 6  | 0  | 0 |
| Tax—Stockholm, refined, .. | 7  | 0  | 0 | 12 | 0  | 0 |
| Archangel, ..              | 1  | 15 | 0 | 2  | 6  | 0 |
| Archangel, ..              | 0  | 14 | 0 | 0  | 14 | 6 |

### CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

#### CONTRACTS.

| Nature of Work, or Materials.                | By whom Required.                | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------------|----------------------------------|-----------------------------------|--------------------------|-------|
| Removal of Road Sweepings & Road Watering    | Hackney Bd. of Works             | J. Lovegrove                      | April 2nd                | ii.   |
| Painting, Tarpaving, Metalling, &c.          | Lewisham Bd. of Wks.             | Official                          | do.                      | ii.   |
| Additions and Alterations to Town Hall       | Leyton Local Board               | W. Dawson                         | do.                      | xiii. |
| Painting Work                                | Whitechapel Union                | Official                          | do.                      | ii.   |
| Sweeping Machines                            | Mile End Old Town                | do.                               | April 3rd                | ii.   |
| Boundary Wall                                | Vestry                           | do.                               | do.                      | ii.   |
| St. Mary (Islington)                         | Guardians                        | W. Smith                          | April 4th                | ii.   |
| Dartford Union                               | G. H. Tait                       | Official                          | April 5th                | ii.   |
| Extension of Buildings, Roofing, Paving, &c. | Midland Railway Co.              | do.                               | do.                      | xii.  |
| Supply of Materials                          | Wood Green Local Bd.             | do.                               | do.                      | xii.  |
| Working Down and Re-building part of Bridge  | Hackney Union                    | W. Barpet                         | April 8th                | ii.   |
| Lock of Bu. Ames, Homerton                   | Manchester Corporation           | G. H. Hill                        | April 9th                | ii.   |
| Alloys, Sluices, &c.                         | Croydon Corporation              | Official                          | do.                      | xii.  |
| White Pine                                   | Great Western Railway            | do.                               | do.                      | xii.  |
| Adding, Additions to Offices, &c.            | Gloucester Rail. Carr.           | Midland & Son                     | do.                      | xii.  |
| Alterations and other Works, Ravenscourt     | Hammer Smith Public              | E. F. Roberts                     | do.                      | ii.   |
| Extending Railway                            | L. & N. W. Ry. Co.               | Official                          | April 10th               | xiii. |
| Painting Faving                              | Central London School            | do.                               | do.                      | ii.   |
| Instructing Sewers, &c. &c.                  | Barking Town Loc. Bd.            | C. J. Dawson                      | April 11th               | xiii. |
| Working Apparatus and Heating Dining Hall    | St. Saviour's Union              | Jarvis & Son                      | do.                      | xiii. |
| Water and Drainage Work                      | St. George the Martyr, Southwark | Official                          | April 19th               | xii.  |
| rought-Iron Fencing                          | West Ham Council                 | Lewis Angell                      | April 23rd               | xii.  |
| gussing Works, Levensden Asylum              | Met. Asylums Board               | Official                          | April 30th               | ii.   |
| Rebasing and Pulling Down Building Mat.      | School Bd. for London            | do.                               | Not stated.              | ii.   |
| Self-detached Villa, Acconington             | Langham & Entwisle               | J. Maden & Son                    | do.                      | xiii. |

#### PUBLIC APPOINTMENTS.

| Nature of Appointment.               | By whom Advertised.    | Salary. | Applications to be in. | Page.  |
|--------------------------------------|------------------------|---------|------------------------|--------|
| Assistant Inspector of Nuisances     | Wandsworth Bd. of Wks. | 35s.    | April 9th              | xviii. |
| Inspector and Inspector of Nuisances | Finchley Local Board   | 250s.   | April 15th             | xix.   |

#### TENDERS.

(Communications for insertion under this heading must reach us not later than 12 Noon on Thursday.)

|                                                                                                                                                                               |            |             |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|--|--|
| BRILLAGIO (Survey).—For the erection of a bungalow, Mr. J. H. Mackay. Mr. Walter Graves, architect, Winchester House, E.C.                                                    | £1,015 0 0 |             |  |  |
| J. R. Hunt                                                                                                                                                                    | 850 0 0    |             |  |  |
| J. Massbridge                                                                                                                                                                 | 785 0 0    |             |  |  |
| Cheswood Bros.                                                                                                                                                                | 785 0 0    |             |  |  |
| A. Foster                                                                                                                                                                     | 785 0 0    |             |  |  |
| Accepted subject to conditions.                                                                                                                                               |            |             |  |  |
| CROYDON.—For the erection of shops at Thornton ath, for Mr. F. Austin. Mr. W. H. Woodroffe, architect. Quantities supplied:—                                                  | £223 0 0   |             |  |  |
| Evans, R. D.                                                                                                                                                                  | 753 0 0    |             |  |  |
| Hart Bros.                                                                                                                                                                    | 698 0 0    |             |  |  |
| Stone & Humphreys                                                                                                                                                             | 698 0 0    |             |  |  |
| Smith, W.                                                                                                                                                                     | 637 0 0    |             |  |  |
| Bartley                                                                                                                                                                       | 609 0 0    |             |  |  |
| G. Parker                                                                                                                                                                     | 609 0 0    |             |  |  |
| J. O. Richardson                                                                                                                                                              | 609 0 0    |             |  |  |
| DEPTFORD.—For work to be executed at the Foreign Cattle Market, for the Worshipful the Cattle Markets Sub-Committee of the Honourable the Corporation of the City of London:— |            |             |  |  |
| B. E. Nightingale (accepted)                                                                                                                                                  | £1,523     | Doors. £250 |  |  |
| EPSON.—For the erection of six cottages, for Mr. J. Wyeth. Mr. J. R. Harding, architect, Epson:—                                                                              | £1,553 0 0 |             |  |  |
| Beasley                                                                                                                                                                       | 1,630 0 0  |             |  |  |
| Strudwick, Epson                                                                                                                                                              | 1,434 0 0  |             |  |  |
| A. Hards, Ewell                                                                                                                                                               | 1,422 0 0  |             |  |  |
| Jesl, Epson                                                                                                                                                                   | 1,275 0 0  |             |  |  |
| Adams, Sutton                                                                                                                                                                 | 1,240 0 0  |             |  |  |
| Hughes, Ashstead                                                                                                                                                              | 1,238 10 0 |             |  |  |
| Chivington, Epson                                                                                                                                                             | 1,185 0 0  |             |  |  |
| Potter, Sutton                                                                                                                                                                | 1,180 0 0  |             |  |  |
| Skilton, Leatherhead                                                                                                                                                          | 1,180 0 0  |             |  |  |
| FINCHLEY.—For additions to Linden Villa, Friern Park, North Finchley. Mr. Thos. Durrant, architect:—                                                                          |            |             |  |  |
| Stevenson                                                                                                                                                                     | £350 0 0   |             |  |  |
| Higgs                                                                                                                                                                         | 273 17 6   |             |  |  |
| Grover & Son (accepted)                                                                                                                                                       | 249 0 0    |             |  |  |

|                                                                                                                                                 |            |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|--|--|
| FOLKESTONE.—For the erection of a shop and premises in the Sandgate-road, Folkestone, for Mr. F. Austin. Messrs. Cowell & Bromley, architects:— |            |  |  |  |
| Falkner, London                                                                                                                                 | £2,970 0 0 |  |  |  |
| W. Marsland, London                                                                                                                             | 8,521 6 0  |  |  |  |
| J. Marsland, London                                                                                                                             | 8,521 6 0  |  |  |  |
| Smith, London                                                                                                                                   | 7,999 0 0  |  |  |  |
| Castle                                                                                                                                          | 7,999 0 0  |  |  |  |
| Denne, Walmer                                                                                                                                   | 7,407 0 0  |  |  |  |
| J. O. Richardson, London                                                                                                                        | 7,355 0 0  |  |  |  |
| Parker, London                                                                                                                                  | 7,259 0 0  |  |  |  |
| Baker, London                                                                                                                                   | 7,253 0 0  |  |  |  |
| Brooks, London                                                                                                                                  | 7,250 0 0  |  |  |  |
| Adeney, Dover                                                                                                                                   | 7,181 0 0  |  |  |  |
| Prebble                                                                                                                                         | 7,149 0 0  |  |  |  |
| Mercur                                                                                                                                          | 7,137 10 0 |  |  |  |
| Webster                                                                                                                                         | 7,100 0 0  |  |  |  |
| Reason                                                                                                                                          | 6,983 0 0  |  |  |  |
| Potts                                                                                                                                           | 6,978 0 0  |  |  |  |
| Hayward & Paramor                                                                                                                               | 6,742 0 0  |  |  |  |
| Tunbridge                                                                                                                                       | 6,727 0 0  |  |  |  |
| Wallace & Sons, Maidstone                                                                                                                       | 6,673 0 0  |  |  |  |
| Martin, Ramsgate                                                                                                                                | 6,613 10 0 |  |  |  |
| Moody                                                                                                                                           | 6,568 0 0  |  |  |  |

|                                                                                                                                                                 |          |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--|--|--|
| FOREST GATE (Essex).—For proposed house, Godwin-road, Forest Gate, Essex, for Mr. Chas. J. Barr, Mr. W. R. Pitt, surveyor, Stratford. Quantities not supplied:— |          |  |  |  |
| Borrows                                                                                                                                                         | £495 0 0 |  |  |  |
| Brand                                                                                                                                                           | 376 0 0  |  |  |  |
| Key                                                                                                                                                             | 376 0 0  |  |  |  |
| Bowles                                                                                                                                                          | 359 12 6 |  |  |  |
| North (accepted)                                                                                                                                                | 316 0 0  |  |  |  |

|                                                                                                                                                                            |            |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|--|--|
| KINGSTON-ON-THAMES.—For making roads and sewers on the Bank Grove Estate, for the Lands Trading Company, Limited, Mr. H. A. Alexander, Surveyor, 72, Cannon-street, E.C.:— |            |  |  |  |
| W. & J. Woodham                                                                                                                                                            | £1,233 0 0 |  |  |  |
| Woodham & Fry                                                                                                                                                              | 1,129 0 0  |  |  |  |
| W. Cunliffe                                                                                                                                                                | 1,107 0 0  |  |  |  |
| S. Kavanagh                                                                                                                                                                | 1,097 0 0  |  |  |  |

|                                                                                            |          |  |  |  |
|--------------------------------------------------------------------------------------------|----------|--|--|--|
| LEE (Kent).—For alterations and repairs at "Ormsby," Dorville-road, for Mr. A. C. Palmer:— |          |  |  |  |
| W. H. Pritchard, London                                                                    | £135 0 0 |  |  |  |
| W. Bailey, Greenwich                                                                       | 116 4 6  |  |  |  |
| J. G. Fuller, 116, Lee-road (accepted)                                                     | 113 12 6 |  |  |  |

|                                                                                                                                                                                                         |             |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--|--|--|
| LONDON.—For the erection of a new branch in Covent Garden and Henrietta-street, for the London and County Banking Company, Limited, Mr. Alfred Williams, architect. Quantities by Mr. James Schofield:— |             |  |  |  |
| Alden & Plater                                                                                                                                                                                          | £13,267 0 0 |  |  |  |
| Mowlem & Burt                                                                                                                                                                                           | 12,190 0 0  |  |  |  |
| Holloway Bros.                                                                                                                                                                                          | 12,060 0 0  |  |  |  |
| Alfred Bush                                                                                                                                                                                             | 11,877 0 0  |  |  |  |
| William Howard                                                                                                                                                                                          | 11,338 0 0  |  |  |  |
| Smith & Co.                                                                                                                                                                                             | 11,533 0 0  |  |  |  |
| Rider & Son                                                                                                                                                                                             | 11,450 0 0  |  |  |  |
| Perry & Co.                                                                                                                                                                                             | 11,394 0 0  |  |  |  |
| William Shepherd                                                                                                                                                                                        | 11,278 0 0  |  |  |  |
| Peto Bros.                                                                                                                                                                                              | 11,269 0 0  |  |  |  |
| John T. Chappell                                                                                                                                                                                        | 10,888 0 0  |  |  |  |
| W. M. Dabb                                                                                                                                                                                              | 10,799 0 0  |  |  |  |
| James Morter (accepted)                                                                                                                                                                                 | 10,473 0 0  |  |  |  |

|                                                                                                                                                    |             |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--|--|--|
| LONDON.—For erecting residential chambers and shops at 8 and 9, Shaftesbury-avenue, for Mr. F. Statham Hobson. Mr. E. Whiteman Rising, architect:— |             |  |  |  |
| Higgs & Hill                                                                                                                                       | £13,110 0 0 |  |  |  |
| Herman & Co.                                                                                                                                       | 13,074 0 0  |  |  |  |
| Patman & Fotheringham                                                                                                                              | 12,729 0 0  |  |  |  |
| B. E. Nightingale                                                                                                                                  | 12,631 0 0  |  |  |  |
| Mowlem & Co.                                                                                                                                       | 12,616 0 0  |  |  |  |
| Grover & Son                                                                                                                                       | 12,566 0 0  |  |  |  |
| Kirk & Randall                                                                                                                                     | 12,325 0 0  |  |  |  |
| Brass & Son                                                                                                                                        | 11,957 0 0  |  |  |  |
| Mark Farrer &                                                                                                                                      | 11,406 0 0  |  |  |  |

|                                                                                            |            |  |  |  |
|--------------------------------------------------------------------------------------------|------------|--|--|--|
| LONDON.—For the erection of new business premises at Streatham, Mr. R. Cruwys, architect:— |            |  |  |  |
| Mason                                                                                      | £4,895 0 0 |  |  |  |
| Boyer                                                                                      | 4,980 0 0  |  |  |  |
| Carson & Son                                                                               | 4,825 0 0  |  |  |  |
| Marsland                                                                                   | 4,800 0 0  |  |  |  |
| Holliday & Greenwood                                                                       | 4,777 0 0  |  |  |  |
| Dowds                                                                                      | 4,733 0 0  |  |  |  |
| Nightingale                                                                                | 4,730 0 0  |  |  |  |
| Smith & Son                                                                                | 4,720 0 0  |  |  |  |
| Cadman                                                                                     | 4,695 0 0  |  |  |  |
| Colls & Son                                                                                | 4,675 0 0  |  |  |  |
| Kynoch                                                                                     | 4,643 0 0  |  |  |  |
| Higgs                                                                                      | 4,550 0 0  |  |  |  |
| Rodwell                                                                                    | 4,536 0 0  |  |  |  |

|                                                                                                                                                                                                |            |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|--|--|
| LONDON.—For the erection of proposed schools in Kite-road, Nunhead, Surrey, for the Rev. H. Grubb and trustees. Mr. E. Hoole, architect, 104, Great Russell-street, W.C. Quantities supplied:— |            |  |  |  |
| Woodward                                                                                                                                                                                       | £2,179 0 0 |  |  |  |
| Lathley                                                                                                                                                                                        | 2,093 0 0  |  |  |  |
| Williams                                                                                                                                                                                       | 1,967 0 0  |  |  |  |
| Higgs                                                                                                                                                                                          | 1,950 0 0  |  |  |  |
| Higgs & Hill                                                                                                                                                                                   | 1,950 0 0  |  |  |  |
| Macfarlane                                                                                                                                                                                     | 1,775 0 0  |  |  |  |
| Crappier                                                                                                                                                                                       | 1,770 0 0  |  |  |  |
| Eldridge                                                                                                                                                                                       | 1,757 0 0  |  |  |  |
| Ward, Clark & Co.                                                                                                                                                                              | 1,730 0 0  |  |  |  |
| Parker                                                                                                                                                                                         | 1,700 0 0  |  |  |  |
| Bowyer                                                                                                                                                                                         | 1,642 0 0  |  |  |  |
| Holloway                                                                                                                                                                                       | 1,575 0 0  |  |  |  |
| J. O. Richardson, Albert Works                                                                                                                                                                 | 1,552 0 0  |  |  |  |
| Peckham (accepted)                                                                                                                                                                             | 1,552 0 0  |  |  |  |

|                                                                                                                                                          |        |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|
| LONDON.—For erecting carcass only of new premises<br>Gray's Inn-road, for Mr. Frederick Sage. Mr. Walter<br>Graves, architect, Winchester House, E.C. :— |        |   |
| Colls & Son .....                                                                                                                                        | £1,380 | 0 |
| J. Morter .....                                                                                                                                          | 1,603  | 0 |
| Grover & Son .....                                                                                                                                       | 1,784  | 0 |
| Lawrance & Son .....                                                                                                                                     | 1,779  | 0 |
| Patman & Fotheringham .....                                                                                                                              | 1,778  | 0 |
| C. Brass & Son .....                                                                                                                                     | 1,769  | 0 |
| Pink, Fryer, & Co. ....                                                                                                                                  | 1,747  | 0 |
| E. Nigter, & Co. ....                                                                                                                                    | 1,746  | 0 |
| Stimpson & Co. ....                                                                                                                                      | 1,680  | 0 |
| J. R. Hunt (accepted) .....                                                                                                                              | 1,646  | 0 |



LONDON.—For additions, alterations, and fittings in forming premises for the Drapery Exchange, No. 187, Cheapside, and No. 45, Gutter-lane, E.C., for the London and Provincial Drapery Exchange Company. Mr. Walter Graves, architect, Winchester House, E.C.—

|                               |        |    |   |
|-------------------------------|--------|----|---|
| J. R. Hunt.....               | £1,895 | 0  | 0 |
| F. Sage & Co.....             | 1,570  | 0  | 0 |
| J. Mansbridge (accepted)..... | 1,448  | 5  | 0 |
| Drew & Cadman.....            | 1,438  | 10 | 0 |

LONDON.—For the completion of Nos. 94, 96, 98, and 100, Broad-street, W., for the superintendence of Mr. William E. F.S.I., 10, Union-court, Old Broad-street, E.C.—

|                                                          |      |       |     |     |
|----------------------------------------------------------|------|-------|-----|-----|
| Arts & Son.....                                          | 94   | 96    | 98  | 100 |
| Barnett.....                                             | £485 | 2,495 | 480 | 480 |
| Flaxman.....                                             | 480  | 480   | 480 | 480 |
| Weeks.....                                               | 478  | 478   | 478 | 478 |
| Mason.....                                               | 442  | 442   | 442 | 442 |
| Fillbrook.....                                           | 439  | 445   | 445 | 430 |
| Saint.....                                               | 438  | 438   | 438 | 438 |
| Cor.....                                                 | 400  | 400   | 400 | 400 |
| Bursell 15, Dyanham-road, West Hampstead (accepted)..... | 391  | 391   | 391 | 391 |

LONDON.—For new premises at Brixton, for the Brixton Co-operative Industrial Society, Limited. Mr. Young, architect:—

|                                 |        |   |   |
|---------------------------------|--------|---|---|
| Walker, Streatham.....          | £1,330 | 0 | 0 |
| Bristow, Norwood.....           | 1,260  | 0 | 0 |
| Candler, Streatham.....         | 1,220  | 0 | 0 |
| Triggs, Clapham (accepted)..... | 1,148  | 0 | 0 |
| Hollingsworth, Peckham.....     | 1,128  | 0 | 0 |

LONDON.—For general repairs to six houses in Malham-road, Forest-hill, for Mrs. Thompson. Mr. A. H. Thompson, architect:—

|                                 |      |   |   |
|---------------------------------|------|---|---|
| Mitchell, Ritham.....           | £325 | 0 | 0 |
| Bowyer, Norwood.....            | 289  | 0 | 0 |
| Triggs, Clapham (accepted)..... | 264  | 0 | 0 |

LONDON.—For alterations and new shop-front at 301, Edgware-road, for Mr. Jameson. Mr. G. Chuter, architect:—

|                               |      |    |   |
|-------------------------------|------|----|---|
| Shiers.....                   | £235 | 0  | 0 |
| Wetherill, Lee, & Marten..... | 324  | 0  | 0 |
| Thomerson & Son.....          | 312  | 0  | 0 |
| Level.....                    | 298  | 10 | 0 |

LONDON.—For building new laundry and works in connexion with machinery at the Licensed Victuallers' Schools, Kennington-lane, S.E. Mr. Geo. Treacher, architect:—

|                         |      |    |   |
|-------------------------|------|----|---|
| Wythe.....              | £225 | 0  | 0 |
| Crabtree.....           | 510  | 5  | 0 |
| Burnman.....            | 510  | 0  | 0 |
| Walker.....             | 491  | 0  | 0 |
| W. Smith.....           | 423  | 0  | 0 |
| B. Cook (accepted)..... | 450  | 10 | 0 |

LONDON.—For erecting two additional stories to 95, Farringdon-street, E.C., for Messrs. Barclay & Sons, Limited. Mr. E. W. Mountford, architect, 22, Buckingham-street, Strand, W.C.—

|                        |        |   |   |
|------------------------|--------|---|---|
| Maxwell.....           | £1,295 | 0 | 0 |
| Keyes, Head, & Co..... | 1,259  | 0 | 0 |
| Johnson.....           | 1,650  | 0 | 0 |
| King & Son.....        | 1,090  | 0 | 0 |

LONDON.—For painting and decorations at 13, Berkeley-square, for Capt. H. C. Denison:—

|                                   |      |   |   |
|-----------------------------------|------|---|---|
| C. Hindley & Sons (accepted)..... | £270 | 0 | 0 |
|-----------------------------------|------|---|---|

LONDON.—For first section of works at the "Mitre and Dove," Westminster. Mr. Thos. Durrans, architect:—

|                                |        |   |   |
|--------------------------------|--------|---|---|
| Bywaters.....                  | £3,234 | 0 | 0 |
| Ward, Clarke, & Co.....        | 3,097  | 0 | 0 |
| Higgs (accepted, by draw)..... | 3,097  | 0 | 0 |

LONDON.—For alterations, &c., to the "Athenaeum," Vale of Health, Hampstead, N.W., for Mr. Charles Peters. Mr. Albert E. Fridmore, architect, 2, Broad-street-buildings, E.C.—

|                                                             |  |  |  |
|-------------------------------------------------------------|--|--|--|
| W. F. Dabbs, Stamford Hill, accepted at Schedule of Prices. |  |  |  |
|-------------------------------------------------------------|--|--|--|

[No competition.]

LONDON.—For works in rear of "Vale of Health Tavern," Hampstead, N.W., for Mr. Charles Peters. Mr. Albert E. Fridmore, architect, 2, Broad-street-buildings, E.C.—

|                                                             |  |  |  |
|-------------------------------------------------------------|--|--|--|
| W. F. Dabbs, Stamford Hill, accepted at Schedule of Prices. |  |  |  |
|-------------------------------------------------------------|--|--|--|

[No competition.]

LONDON.—For the erection of seven shops and workmen's dwellings in Dawes-road, Waltham-green. Messrs. Beazley & Burrows, architects:—

|                             |         |      |     |
|-----------------------------|---------|------|-----|
| Higgs & Hill.....           | £19,864 | £730 | £20 |
| Stanley Bird.....           | 10,579  | 645  | 39  |
| Boyce.....                  | 10,269  | 600  | 74  |
| Grover.....                 | 9,593   | 528  | 40  |
| J. & J. Greenwood.....      | 9,579   | 512  | 40  |
| Collis & Sons.....          | 9,863   | 630  | 40  |
| B. E. Nightingale.....      | 9,643   | 530  | 39  |
| Perry & Co.....             | 9,627   | 498  | 43  |
| Smith, Son, & Fletcher..... | 9,523   | 540  | 130 |
| Simpson & Son.....          | 9,464   | 500  | 40  |
| Wall Street.....            | 9,370   | 498  | 56  |

LONDON.—For the erection of ten houses, at Menotti-street and Chesham-street, Bethnal-green. Messrs. T. & W. Stone, architects:—

|                      |        |   |   |
|----------------------|--------|---|---|
| Jarvis & Sons.....   | £3,680 | 0 | 0 |
| G. W. Beale.....     | 3,650  | 0 | 0 |
| Knight & Sons.....   | 3,477  | 0 | 0 |
| Thomerson & Son..... | 3,450  | 0 | 0 |
| Edwards.....         | 3,363  | 0 | 0 |
| Higgs.....           | 3,200  | 0 | 0 |
| Edman Bros.....      | 3,140  | 0 | 0 |
| Ball & Brown.....    | 2,773  | 0 | 0 |

LONDON.—For the completion of No. 45, Salisbury-road, Kilburn, N.W., under the superintendence of Mr. William E. F.S.I., 10, Union-court, Old Broad-street, E.C.—

|                                           |      |    |   |
|-------------------------------------------|------|----|---|
| Clark, 15, Harrington-grove, Hornsey..... | £138 | 15 | 0 |
|-------------------------------------------|------|----|---|

NEW MARKET.—For the erection of new training establishment at Newmarket, for Mr. M. Dawson. Mr. Jno. F. Atman, architect, Newmarket:—

|                                    |        |   |   |
|------------------------------------|--------|---|---|
| Kerridge & Shaw.....               | £4,484 | 0 | 0 |
| Simpson & Son.....                 | 4,453  | 0 | 0 |
| Linnell, Newmarket (accepted)..... | 4,340  | 0 | 0 |
| Hunt & Blyth (withdrawn).....      | 3,850  | 0 | 0 |

NEWPORT (Mon.).—For new business premises, 31, 32, and 33, Commercial-street, Newport, Mon., for Mr. J. Liscoombe. Messrs. W. & G. Henshaw, architects, Newport. Quantities by the architect:—

|                                                       |        |   |   |
|-------------------------------------------------------|--------|---|---|
| Charles Read, Newport.....                            | £4,200 | 0 | 0 |
| C. Lock, Newport.....                                 | 3,775  | 0 | 0 |
| Moulton & Browncombe, Newport.....                    | 3,765  | 0 | 0 |
| Henry "Artist, Pontnewydd.....                        | 3,730  | 0 | 0 |
| W. Jones & Son, Newport.....                          | 3,725  | 0 | 0 |
| Charles Miles, Newport.....                           | 3,680  | 0 | 0 |
| W. Price, Newport.....                                | 3,618  | 0 | 0 |
| J. Linton, Newport.....                               | 3,609  | 0 | 0 |
| W. Blackburn, Newport.....                            | 3,587  | 0 | 0 |
| J. Jenkins, Newport.....                              | 3,531  | 0 | 0 |
| T. Fresser, Newport.....                              | 3,500  | 0 | 0 |
| Alfred Hazel, Newport.....                            | 3,495  | 0 | 0 |
| The Executors of W. Gradwell, Harrow and Newport..... | 3,440  | 0 | 0 |
| George Wilkins, Newport (accepted).....               | 3,431  | 0 | 0 |

STRATFORD.—For alterations, &c., at No. 202, The Grove, Stratford, E., for Mr. H. Sanders. Mr. H. Theobald, architect, Leyton House, Goodall-road, Leytonstone, E.—

|                                          |      |   |   |
|------------------------------------------|------|---|---|
| A. Reed, Stratford.....                  | £279 | 0 | 0 |
| Lister & Co., Snow-hill.....             | 540  | 0 | 0 |
| Bishop & Webb, Stratford (accepted)..... | 487  | 0 | 0 |
| Wilson & Co., Stratford.....             | 471  | 0 | 0 |

WATFORD (Herts.).—For the construction of new roads, sewers, &c., on the Rose and Crown estate, for Mr. F. Fisher. Mr. Charles P. Ayres, surveyor, 52, High-street, Watford:—

|                                       |        |    |   |
|---------------------------------------|--------|----|---|
| Fratt, Watford.....                   | £1,494 | 0  | 0 |
| Dove, Watford.....                    | 1,455  | 0  | 0 |
| Turner, Watford.....                  | 1,398  | 0  | 0 |
| Hazelgrove, Luton.....                | 1,397  | 0  | 0 |
| Judge & Eames, Watford.....           | 1,396  | 0  | 0 |
| Waterman, Watford.....                | 1,295  | 0  | 0 |
| Pitkin, Watford.....                  | 1,145  | 0  | 0 |
| Capper, St. Albans.....               | 965    | 10 | 0 |
| Brooks, Hanton Bridge (accepted)..... | 962    | 2  | 6 |

WINCANTON (Somerset).—For new farm-house, garden-walls, fencing, &c., part new farm-buildings, and repairs to old portion, at Redgrove Farm, for Mr. H. T. Scammell, 105, South Hill Park, Hampstead Heath, N.W. Mr. Stewart, architect:—

|                                 |        |    |   |
|---------------------------------|--------|----|---|
| Read, Buckhorn Merton.....      | £1,564 | 10 | 0 |
| Benfield, Chertem.....          | 1,579  | 13 | 0 |
| Dean, Shaftesbury.....          | 1,465  | 0  | 0 |
| Samuel Curtis, Stalbridge.....  | 1,417  | 0  | 0 |
| Richard Curtis, Stalbridge..... | 1,385  | 0  | 0 |

Accepted.

## TO CORRESPONDENTS.

S. R. (The fact of a man advertising in that form ought to put any sensible people on their guard against him).—C. J. S. (Thank you).—We cannot see anything worth notice in the patent, which is a very crude kind of thing. C. N. (Question still unimpeachable. How can a quantity-surveyor have "exceeded his instructions as far as expenses?" His business is to find out what the quantities are. On a quantity-surveyor's books and giving addresses. Who has taken out his own quantities? If you cannot state quantities clearly, it is useless asking for replies. R. B.—P. R. W. (shall have attention. R. B. should send amount. G. H. (to do it without disturbing the boards or ceiling is impossible, and it is not worth while to put the question). All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses. Note. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications beyond news items, which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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### Architectural Remains at Athens.



HE excavations on the Acropolis of Athens are now drawing to a close. The whole area within the walls has been carefully excavated down to the level of the natural rock, and the things found are

being gradually arranged in the two museums. The part last gone over was the precinct of Artemis Brauronia, near the Propylæa. In this vicinity was found an interesting archaic relief representing three women hand-in-hand, with a child behind, and a man in front playing a flute. This relief is similar in style to some of the early archaic figures found two years ago. It retains slight traces of colour. Some large marble gorgon-heads have also been recently found.

The back of the Pelagic wall behind the south wing of the Propylæa has now been exposed, and shows us a wall of about 19 ft. thick, built of large, rough blocks of Acropolis rock, with smaller stones fitted in between (fig. 1).

On the lower terrace, to the west of the Parthenon, the foundations of a large building have been brought to light. It appears to have been an oblong hall about 135 ft. long by 45 ft. wide, and part of the south wall of the Acropolis forms one of its long sides. On its north side are traces of another wall, several feet distant, which seem to indicate the existence of a stoa in front. The foundations are built of large, square, dressed blocks of poros stone, somewhat similar to those forming the substructure of the Parthenon. Dr. Dörpfeld, as we have already noted in a former number, thinks this building is the Chalcotheke. The position of this has always been doubtful, and its site has been variously fixed from time to time, but the building just discovered is more nearly adapted to the requirements of a large store-house, such as it was, than any of the others hitherto identified with it.

On this site several large poros capitals have been unearthed, similar to those found in the north wall at an earlier period of the work; also two or three smaller ones of about the same date as the large ones.

We have now on the Acropolis an important series of Early Doric caps of poros stone, coated with gesso, and, in conjunction

with those of the Propylæa and Parthenon, they form an interesting study of the development of this order up to the time of Pericles, when it attained its greatest perfection.

We give on p. 254 (fig. 2) sections of some of these caps. Nos. 1, 2, and 3 are the earliest; they belong to a temple which stood, probably, on the site of the Parthenon previous to the Persian War. They are of a simple character, avoiding the elaborate ornamentation of the annulets and the cutting back of the stops to the flutings found in the very early examples at Pestum and in Sicily. They are, however, like the plainer forms found there, and like those of the Hereum at Olympia. Nos. 1 and 2, which have an incised splay dividing the abacus from the echinus, are almost identical with those of the temple at Assos. They probably date from the beginning of the reign of Peisistratos,—that is, from the early half of the sixth century B.C. There is considerable variety in these caps; while they are all of about the same diameter, they differ to some extent in the shape of the echinus, the arrangement of the annulets, and the section of the flutings, of which there are twenty to the circumference. Similar variations were found at Assos, so that this seems to have been a characteristic of the earlier age, and shows a freedom from absolute repetition which is interesting. The large poros stone pediment sculptures now in the museum probably belong to the same structure as these capitals.

We also find a few pieces of a Doric pillar with spiral flutings (fig. 3). This is interesting, as being the only instance which we know of the use of this form in Greek times. There are no complete drums, but enough remains to show that it has been a tapered pillar with a diameter of 2 ft. 6 in. near the base, and with eighteen flutes in the circumference. A piece of the top drum under the capital exists, and has four incised rings cut in it. The cap was presumably like those just mentioned, and from the general similarity of character, and slightly smaller diameter, we may assume it as likely to have been one of the pillars in the Pronaos of this early structure.

There are also rather fragmentary remains of other architectural members, some of which undoubtedly belong to this temple, but, as they are at present unarranged and heaped up indiscriminately, it is impossible to examine them in detail. No. 4 (fig. 1), of which a large number have been found, agrees in proportion with the entablature remains in the north wall of the Acropolis, where some of

these capitals are still embedded. They are possibly part of the temple which stood, in Persian times, between the Erectheum and the Parthenon, the foundations of which have been discovered during the recent excavations. No. 5 is a smaller variety of a similar type; it may have been the capital of the pillars in the interior of this temple, if there were any, which is doubtful, or might have belonged to the stoa of the Chalcotheke, near which the fragments of this size were found. These caps (Nos. 4 and 5, fig. 1) are of a later form than those first mentioned, the echinus is much longer and flatter, and has less projection relatively in proportion to its depth. They resemble more nearly the capitals of the Zeus temple at Olympia, and the Athene temple at Egina, and their general characteristics lead us to suppose that they are of quite the end of the sixth century, or just before the Persian War.

Along with these capitals we give sections of those of the Propylæa and Parthenon, for the sake of comparison.

Other architectural fragments of poros stone have been discovered during the excavations to the south of the Parthenon, and are now collected in the new museum. They belong to a much smaller structure than those first mentioned, but to about the same period. They are interesting, as showing the simpler character of the mouldings of that time, and also because they still retain considerable traces of colouring in good preservation.

There are a smaller series of pediment reliefs in the museum of about the size to suit this temple, and they also show a good deal of colour. The architect employed during the recent excavations has taken in hand to arrange these fragments, and to reconstruct them as far as possible; so it would be premature at present to do more than refer to them generally.

Many other interesting points for study have been brought to the front as the result of the recent finds: an important one is the large collection of remains of pedestals for votive offerings, of some of which sketches are given (figs. 4, 5, and 6). These pedestals are curiously thin and slender in proportion to the size of the bronzes or sculptured figures they were intended to support. They generally take the form of thin circular shafts, although occasionally we find them octagonal or square as well. The base is usually a plain square stone, but the capitals vary considerably in design. They have mostly a dedicatory inscription on them, and we find this variously placed, sometimes horizontally on the abacus

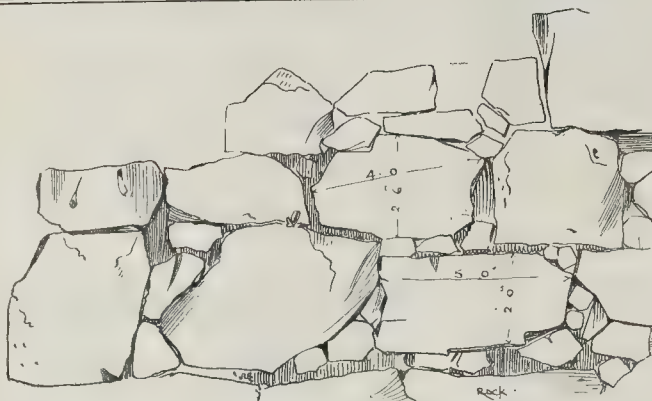
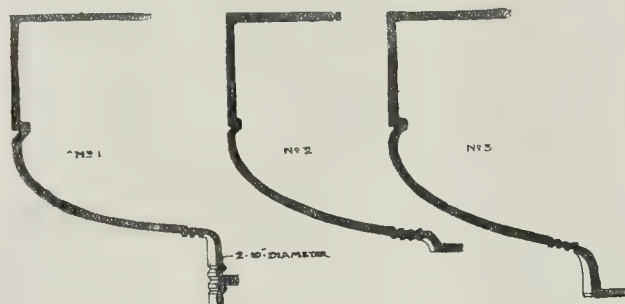


Fig. 1.—Pelagic Wall, West end of Acropolis.



EARLY DORIC CAPITALS ON THE ACROPOLIS



Fig. 2.—Sections of Doric Capitals.

of the caps, at others vertically on the columns, and, where these are fluted, running up the channel of the flutes. Most of the capitals bear more or less traces of coloured ornament of great variety and interest.

There are a number of capitals of Ionic character (fig. 7), ranging from the plain-shaped block without echinus or projection, and with the lines of the volutes simply painted on, to the more elaborate form with ornamented abacus, carefully hollowed volute, and projecting echinus. A curious fact in connexion with these is that the shafts belonging to them, of which several fragments remain, have Doric flutings.

Another interesting series is that of the

gutters, marble and terra-cotta, which show considerable variety both in form and manner of treatment, from the simple upright face with projecting moulded spouts and coloured or incised ornament to the delicate undulating curve with more elaborate colouring, and lion's-head gargoyles also coloured. We find also tile ends, where there were no gutters, which projected over the cornice several inches, and had painted frets or other ornament on under-side and edge, and painted acroteria finishing each row of cover tiles over.

We can now study carefully in the museums the question of the use of colour by the Greeks on their architecture and sculpture in

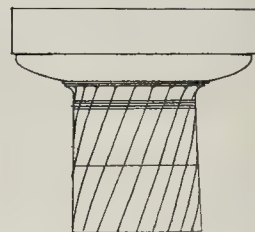


Fig. 3.—Doric Capital with Spiral Fluting.

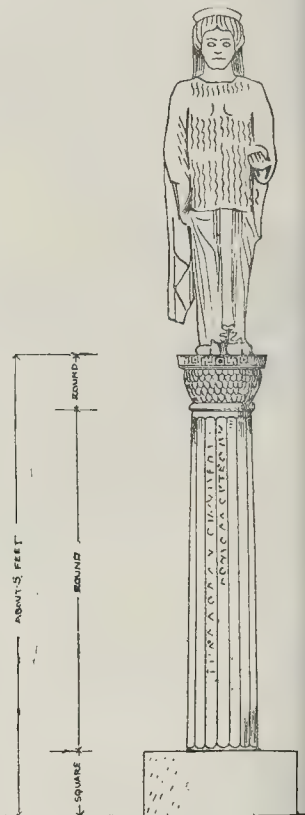


Fig. 4.—Archaic Pedestal with Figure.

archaic times. Considerable traces remain on most of the numerous statues found recently, generally in the form of borders to the robes, or stars scattered over the surface of the garments. Sometimes part of the robe is coloured where only a small portion shows, as is also the hair and the diadem form of head-dress which we see on most of them, and the lips, eyes, eyebrows, &c., are slightly emphasised in this way. The variety of treatment in the borders is considerable, the ornament is generally a kind of fret or meander, but on hardly two robes do we find it alike, either in form or arrangement. The principal colours used are a deep vermillion red, a strong blue and a bright olive green, with occasionally a brown or a yellow, the latter having perhaps been originally gold.

Additional light has been thrown on many points in the history of vase-painting through the fragments, mostly very much broken, which were found in the layers of rubbish of different periods. These are at present being arranged in cases in the museum.

On the Acropolis the remains of the temples, &c., are being gathered as much as possible round their sites; but, unfortunately, this is





Fig. 5.—Square Pedestal Cap.

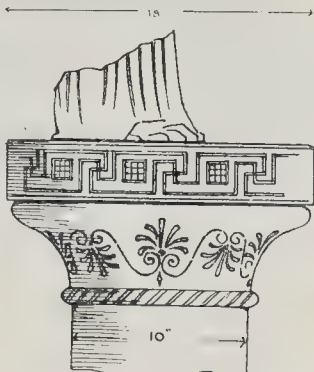


Fig. 6.—Circular Pedestal Cap.

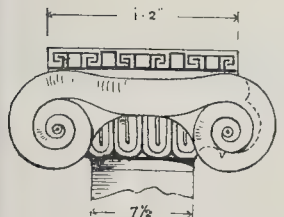
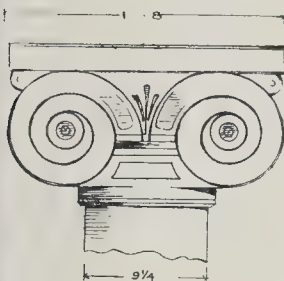


Fig. 7.—Ionic Capitals.

ing done in a rather too systematic manner, and the result at present is that towards the east and south of the Parthenon the place looks very much like a builder's yard, with large blocks arranged in order, row behind row, and neat paths running between them. On the north side of the Parthenon, the blocks still lie in picturesque confusion, much as they originally fell.

The remnant of the Turkish minaret in the basement of the Parthenon is to come down, and with it will disappear the last vestige of the Athens *in situ* on the Acropolis. Much diversity of opinion exists as to the advisability of having destroyed all record of intermediate history, but, whatever one may think, a work has been done, and whether we have gained or lost by it, each one can determine for himself.

The main entrance to the Acropolis is again the "Beulé" gate. The Turkish gatehouse to the right, above the Odeum, is fast disappearing, and an iron railing of a not very pleasing character is being put up between the Niké bastion and the south end of the main outwork. The Niké bastion itself is in danger of giving way, and shows a considerable bulge outwards, which has lately been rearing. This will be strengthened by a few buttresses, which may not improve its appearance, but which is, under the circumstances, an undoubted necessity.

It is proposed to restore the south wing of the Propylæa. The stones of the end pier of the cornice to the south wall were all

found in good condition, embedded in the Frankish tower which stood here, and which was such a prominent feature in the view of the Acropolis till within fourteen years ago. The restoration will only go as far as replacing these stones in their original positions.

The Greek Archaeological Society now intends to direct its attention to excavating along the foot of the Acropolis rock on the north side, and it is probable that their labours will be rewarded by important topographical discoveries. The Germans are at present digging at the south side, on the upper part of the Theatre of Dionysus, in the hopes of finding traces of an earlier theatre, but as yet they have not discovered very much. They have found a few remnants of walls, and have also come across a large square shaft, probably a well, of about 6 ft. square and very considerable depth, and this is being cleared out in the hope of finding something of interest embedded in the deposits at the bottom.

Dr. Dörpfeld, the director of the German Archaeological Institute in Athens, who has done so much for recent archaeological archaeology in Greece, has nearly concluded his series of Saturday afternoon lectures to the German students. These lectures, which have been going on weekly during the winter, have embraced all the classic buildings and sites in Athens and its neighbourhood, and have been of the greatest service to all archaeological students, in helping them to understand graphically and clearly the history and topography of ancient Athens and its remains, and

of bringing before them the latest theories and discoveries.

Besides the excavations at the Acropolis, nothing of great importance has been done in Greece during the winter. The great work of the future will be the excavation of Delphi. For the last two years it had been understood that the French School would take this up, but recently the arrangements which were in progress seem to have fallen through, and it is believed that eventually the work will be done by the Greek Archaeological Society.

The German Institute has now been transferred to its permanent quarters in the new building erected for it by Dr. Schliemann in a central part of Athens.

The American School have finished their excavations of last year at Dionysos, behind Pentelicus, which they identified as the site of the ancient Ikaria, and where they discovered the foundations of a temple of Apollo, and also many important inscriptions and interesting reliefs. They have also investigated the site of old Stamata, in the same district, which has yielded a few inscriptions, and are now directing their attention to sites in Boeotia. At Anthedon, within the last few weeks, they have laid bare the foundations of a very large building, but what it was they are not yet in a position to say. A very fine set of bronze tools was found here. They are now working on the site of Thisbe. The British School are again busy in Cyprus, and are getting together a series of full-size details of Greek architectural mouldings of the best periods. An appeal was made in connexion with this work in the columns of the *Builder*, in January last. When completed this will form a valuable addition to our collection of works on the architecture of the Greeks.

Architects may not generally be aware of the advantages afforded to the student by the establishing of this school, which is now in its third session. It offers a centre in Athens to all students of Greek literature and art, and has attached to it a library which, although yet in its infancy, will develop into a valuable collection in course of time, if it meets with the encouragement it deserves. At present the architectural section is woefully deficient, and architects who appreciate the objects aimed at, and who can aid in no other way, may give substantial help by contributing books on architectural subjects which are essential to students working and travelling in Greece. Such books as "Stuart and Revett," "Vitruvius," "Fergusson," "Texier and Pullan's Byzantine Architecture," are invaluable, and there are many others one could name equally so. Then, again, there are a class of books which bear more or less indirectly on Greek art, such as Perrot and Chipiez's "Egypt," "Assyria," &c.; Jackson's "Dalmatia," Middleton's "Rome," and so on, which certainly ought to have a place on the shelves.

When we mention that students of the Royal Academy and of the Institute of British Architects have a right of admission to the privileges of the school, and have also an opportunity of residing in the school buildings, it seems reasonable that architects should give what help they can to an institution which may exercise not a little influence for good on the work of another generation. Last year, out of a total of six students, three were architects, which shows that architectural students have not been slow to take advantage of the opportunity opened up; and it now remains for the architects themselves to encourage students, and assist in the endeavours of the managers of the school to make it a centre of substantial influence on the future of architectural art in England.

**Michigan.**—The first house in Gladstone City, Michigan, U.S.A., was begun fifteen months ago. At present this new town contains 2,000 inhabitants, and consists of a number of pretty streets, paved with cedar and lighted by electricity, with a town-hall, a fire-brigade station, five churches, three schools, six factories, fifty shops, and a newspaper.







te (the ποικίλη ἱστορία of Pausanias). Dr. Dörpfeld's paper, written with its accustomed brilliancy, is too detailed for its argument to be resumed here. It is accompanied by a valuable new plan of a portion of the Alais, showing the relative positions of the earlier and later Alais walls. It is interesting to note that Dr. Dörpfeld's new plan establishes the accuracy of the much-abused Pausanias.

A THIRD paper, by Dr. Graef, should be of special interest to English readers. It contains a full account and discussion of the Thrasyleus monument,—a monument which has hitherto been distinguished by the amount of vague and inaccurate statements respecting it in current guide-books. The statue which surmounted it was brought, as every one knows, to England by Lord Elgin, and is in the British Museum. It is now adequately published, we believe for the first time, in a phototype plate (page 41) of the "Mittheilungen." The special value of the paper is, however, its clear statement as to the relations between the two founders of the monument, the triple inscription, and the various kinds of choragic dedications. It remains to note a paper, long looked for, by Dr. Winnefeld, on the vase fragments found in the Kabairos sanctuary near Thebes. If they do not, so far, add much to our knowledge of the cult of the obscure father and son, they certainly open up an entirely new field in the study of local manufacture; their style is so far without parallel in the whole history of Greek ceramics; and last, though not least, they are a clear devoted to, and, no doubt, influenced by, a particular temple cult. Accused as we are to regard vases as the outcome of the grave, every instance of this kind of high value.

MR. ARTHUR PICKARD'S invention for utilising canals for transport on a new principle is ingenious and simple, and seems likely to be practicable commercially. He proposes, instead of hauling boats through the water, to move the water itself, which is to carry the boats with it. For this end, however, the canal and boats are to be very different from those hitherto in use. The canal is to be a double one, divided by a bulkhead or midfeather, and, like the usual canal, carried over the country at different levels as the contour of the land requires. In each portion that is on one level (or "between locks," as would be said on the old form of canal) the water is to be kept flowing round, moving continually east to west, let us say, on one half of the canal, and west to east on the other half, by means of a fan on a screw propeller principle, turning in a recess in the dividing partition, and thereby constantly lifting the water from one trough of the canal into the other, and creating a flow from the higher to the lower side. This is to be actuated by a stationary engine, which will also be available as a power to hoist and sling the "boats" from one level to another, in place of the now tedious lock system. It is calculated that a 6-horse-power engine will be sufficient to create a flow at the rate of three miles an hour; and the continuous movement of the water will prevent freezing in winter. The boats, of course, are quite a different matter from ordinary canal boats, being rather iron baskets than boats, parallelograms in form, and nearly fitting the width of the trough, just leaving sufficient play. As any number of them can be placed on the water at once, without interfering with one another, they make up the carrying capacity by number instead of size. They are also to be furnished with wheels, so as to be easily drawn up on to a shelving way when required. The working-model which we have seen is at all events quite a success in its action. Mr. Pickard suggests that the system can be made applicable to existing excavated canals by forming a bank down the middle, with sheet piling puddled

between; but in the case of new canals on this system he proposes merely to build them on the surface of the ground, of flanged iron tanks 9 ft. in length laid continuously, and 4 ft. deep. They will not look very beautiful objects on a landscape, but they ought to be useful, especially for cheap transit of goods over a few miles distance, in which respect this form of canal seems to present the same kind of utility, in another form, as that offered by the late Professor Jenkin's telephage railway.\*

IT is proposed to reconstruct the Gray's Inn-road front of the Royal Free Hospital, and so to extend the accommodation for patients, Mr. William Harvey being the architect. Thus will be removed the old entrance gateway, surmounted by the figure of a lion supporting a shield that bears the initials "G. R.," and "Stables of the Light Horse Volunteers." On August 31, 1842, the governors bought the lease of the vacant barracks. The charity migrated thither from the original premises in Greville-street, St. Andrew's, Holborn, where, mainly by the exertions of Dr. William Marsden, a free hospital had been opened on February 28, 1828. The premises have gradually extended to their present proportions, consisting of a square, with some outbuildings at the rear abutting upon the work-yards of Messrs. William Cubitt & Co., builders, which cover the site of Bagnidge Wells tea-gardens. One of the many springs which, in this part of the town, formerly fed the river Fleet in the eastern valley below, still rises in the hospital basement, where a well is sunk to collect the intermittent supply. The hospital's northern wing was built in 1855-6, as a memorial to the late Duke of Sussex; the southern, or "Victoria" wing, for sixty beds, in 1877-8, on site of portion of the barracks, from out of the Milne bequest of nearly 11,000*l*. Further accommodation for the nurses and staff, a museum, theatre, &c., were added in the following year, with the proceeds of the Wynn-Ellis and other legacies.

AN ancient and historical country house has been placed in the market. It is that of the manor of Ockholt, latterly known as Ockwells, in Bray parish, Berkshire, formerly a seat of the Norreys family, ancestors to the Lords Norreys of Ryecote. In the year 1267, Henry III. gave to one Richard de Norreys, cook to his Queen, Eleanor of Provence, a grant of this manor, it being therein described as part of Windsor Forest. That family subsequently acquired two other manors in the neighbourhood: Mores, or Moores, and Hynden. The latter of these was sold by Lord Norreys to Sir Thomas Bodley, who appropriated it for endowment to his library in Oxford University. Sir William Norreys, who commanded the King's army which defeated Lambert Simnel at Stoke, near to Newark, on June 16, 1487, died seised of Ockholt, in the year 1507. The manor has also been owned by the Fettiplaces and the Finches. Some parts of the present structure are said to be nearly seven centuries old; others date from the latter half of the fifteenth century. It contains a hall with interior gallery, and a fine old dining-room and staircase, and is extensively fitted with oaken panelling. In the "Magna Britannia" of Daniel and Samuel Lysons, vol. i., part 2 (1813), will be found an illustration of the four-gabled half-timbered front; also two pictures, tinted in "proper" colours, of panes of the hall windows, bearing the coat-arms of Henry VI. and his consort Margaret of Anjou; of the abbot of Abingdon, with a mitre; of Beaufort, Duke of Somerset; and of Norreys, with the oft-repeated motto of their house, "Feythfully Serve." The grounds are about twenty-one and a half acres in extent.

IN the last number of the *Scottish Art Review* an article is devoted to the exploitation of Mr. William Stott of Oldham,

\* All particulars of the scheme, in regard to the commercial working of it, can be obtained from Messrs. J. O. Chadwick & Sons, 55, Finsbury-pavement, London.

whose pictures we have occasionally contemplated with curiosity and wonder in various exhibitions. It appears that Mr. William Stott is "one of the small number of English artists who are bold enough to uphold the standard of English art on the Continent"; which we suppose means that he has succeeded in getting some of his works exhibited in foreign Exhibitions. Mr. Stott, we are told, "has won distinction as a fine draughtsman in a school where to draw is considered as the highest merit of the artist"; i.e., in the Ecole des Beaux Arts. We can only ask readers to compare the statement with the example of figure-drawing given in the accompanying plate of a figure of "Diana," a figure which is almost monstrous, the lower part of the trunk being apparently forgotten, and the legs joined on to the waist. If the artist got a medal at the Salon for work of the stamp which we have seen from him in English exhibitions, it is a proof not so much of his excellence as an artist, as of the decline which is taking place in French standards in painting, under the influence of the craze for novelty and so-called originality. It is a pity that a review which shows so much general ability and enthusiasm as the *Scottish Art Review* should run after and applaud these unwholesome eccentricities.

THE April number of the *Art Journal* contains an article on the Tower of London, by Mr. W. J. Loftie, with various illustrations, of which the most interesting is a reproduction of a print by Hollar. The article is rather historical than architectural. At the close of his article Mr. Loftie says "the recent 'restoration' is a subject too painful for discussion here." The same number of the *Art Journal* contains an engraving of Mr. Pettie's admirable work, "A Sword and Dagger Fight" exhibited some years ago at the Royal Academy, and another of Mr. Solomon's big commonplace picture called "Niobe," which is praised far beyond its merits. It is a cleverly drawn and composed thing, no doubt, but as a pictorial translation of an ancient poetic legend it is simply vulgar.

AT Messrs. Dowdeswells' Galleries in New Bond-street there is a collection of oil paintings by French and Dutch artists on view for a few days which is very well worth seeing. There are nearly two hundred (mostly small) pictures, and among the names represented are Diaz, Corot, Daubigny, Théodore Rousseau, Dupré, Millet, Georges Michel, Meissonnier, and Israels. Of the Daubigny and Dupré examples not much can be said, they are not important works; but the two Meissonniers are admirable, many of the small works by Corot are in his best way, and the collection by Israels includes some of his finest work, and is alone worth going to see.

THE well-known Vienna architect, Oberbaurath Professor Friedrich von Schmidt, has been called to what here in England would be the House of Lords, by special Imperial letters patent, "in consideration of eminent services to art."

THE March number of the *Bookbinder*\* contains two very interesting illustrations, one of a binding of one of Corneille's Works by Monnier (Versailles, 1760), a rich design of flowing arabesques; the other an ancient Arabic binding of a copy of the Koran (no date) of distinctly Arabic character in the main. The editor remarks:—"Under the inscriptions will be found several motifs that have probably influenced the work of Italian workmen. For it has been pretty well established that much of the ornament produced by Aldo and his successors at Venice,—both in the decoration of the outside and inside of their books,—was borrowed from the East, whence they had brought many of their workmen." On this semi-Oriental character of many of the Venetian bookbinding designs we have commented before. The position of Venice in relation to Oriental trade affairs, of course, a full explanation of it.

\* W. Clowes & Sons.



## LETTER FROM PARIS.

It is now only a month before the opening of the Exhibition, which has been officially fixed for May 6, and though certainly that is little enough time for all that has to be done, the remaining preparations are being carried on with so much energy that it seems probable everything will be fairly complete by the opening.

The Algerian and Tunisian palaces on the esplanade of the Invalides, now nearly completed, have a very decorative effect, with their applied polychromatic decorations in faience. The native workmen sent over to decorate the palaces of Cochinchina and Tonkin have commenced their task. Opposite these rises the monumental-looking façade of the pavilion of the War Department, in front of which is a gateway pierced with loopholes and flanked by two large towers, whose stern Medieval character contrasts effectively with the pilasters, columns, and bas-reliefs of the principal structure.

Going from the Esplanade des Invalides to the Champ de Mars along the interminable galleries of the agricultural department which border the Seine, we find on the right, after having passed the Palais d'Hygiène, a rotunda built on piles and intended for the panorama of the Compagnie Transatlantique. This panorama, to which we have before referred, is now nearly completed, and the result, which is supposed to be a view of the port of Havre seen from the bridge of a large steamboat, is very effective, and realistic almost to the point of an optical illusion. The artists are MM. Polipot and Du Patey.

It is at this part of the Champ de Mars also that the collection of archaeological architecture, carried out under the direction of M. Garnier, commences. The Champ de Mars itself is crowded with pavilions, kiosks, bouses, galleries, verandahs, &c., which seem to have sprung up out of the ground amid the plantations. In the Galerie des Machines the ceiling decorations are now fixed and the installation of the exhibits has commenced. In the Pavillon des Expositions Diverses many of the cases are now in position, and the decoration of the naves and the dome nearly complete; and among the foreign sections, that of England is all decorated and prepared for exhibits. The Cairo Street is completed.

The restaurants in various parts of the buildings are in active preparation, and concerning these there have been some difficulties; and some of the artists, among whom MM. Meissonnier and Bouguereau are prominent, have objected that the works of art exhibited in the Palais des Beaux Arts will be in constant danger of fire from the proximity of restaurants and cooking apparatus. An investigation into the arrangement of these establishments and their accessories has shown that there is practically little cause for anxiety, though a few modifications in the situation of kitchens, &c., have been made in order to allay the fears of the alarmists. The Eiffel tower, as you will have learned already, has completed its allotted height, and only now waits for the addition of the *loge* at the top to contain the apparatus for the electric light which is to be visible, we are told, for forty or fifty miles round Paris.

During the Exhibition there will be held at Paris a "Congress of Art and Archaeology" with the special object of studying all the questions relative to the protection of monuments which possess artistic or historic interest. This Congress, which will be presided over by the Minister of Public Instruction, will include among its members the Commissioners of Fine Arts of the Foreign Sections, and the office of general secretary will be taken by M. Baudot, Inspecteur-Général des Travaux Diocésains.

An exhibition of considerable interest has been initiated by M. Antonin Proust, the object of which is to collect and bring under public notice the art treasures of the principal churches in France, a number of which are to be collected on loan in the galleries of the Sculpture Museum in the Trocadéro. The splendid offerings made to the Catholic church from time to time by the kings of France will here be exhibited, amid reproductions of fragments of ecclesiastical architecture such as will form an effective and suitable framing to the objects exhibited. A further item in this exhibition will be the collection of a number of designs by French diocesan architects.

During the past month an exhibition of the works of Feytaud Perrin has been opened at the Ecole des Beaux Arts. Few artists have pro-

duced such a quantity of work as he, and of such various classes of art,—historical paintings, still life, landscapes, and portraits. In this respect the collection is certainly of interest in giving an idea of the incessant labours of a clever and indefatigable artist; but it would have been much better to have made a judicious selection from all this crowd of pictures. From neglect of this the result is an exhibition containing a considerable proportion of work of little interest, and which has consequently failed to attract the public. After Feytaud Perrin it will be the turn of Lavielle, the landscape painter whose death we recorded about two months ago, and who was one of Corot's best pupils: an exhibition of his works is now in preparation.

During last month the first competition has been decided for the decoration of the Mairie of the XIV. arrondissement. Three artists, MM. Chabas, Georges Roussel, and Adrien Tanoux, have been selected to take part in the second competition, which will be decided during the month of June.

We have to mention also the competition in sculpture opened by the Ministry of Agriculture, for the execution of objects of art to be given as prizes in the general agricultural competition. From among the numerous sketches sent in, fourteen designs have been selected. Among the number, that of M. Gaudet merits special mention. This is a design entitled "La Paix," and is to be reproduced in solid silver; it represents an antique figure of a husbandman leading two oxen, and kissing an infant who is laid out to him by his young wife. The group is vigorously modelled and very harmonious in composition.

We mentioned last month that the Académie des Beaux Arts was proceeding to the election of a member in the place of Cabanel. From among the candidates then named, the choice has fallen on M. Henner, whose poetic but shadowy figures, with pearly flesh tones somewhat recalling the manner of Correggio, are among the most familiar works of contemporary art. We may mention here that he was a pupil of Drolling and of Picot, obtained the Prix de Rome 1858, and medals in the Salons of 1863, 1865, 1866, and 1878, and was created Chevalier of the Legion of Honour in 1873 and Officer in 1878.

M. Émile Lévy, who was one of the candidates for the place vacated by Cabanel's death, has been more fortunate at the Hôtel de Ville than at the Institut. It was necessary there also to fill the place of Cabanel in the decorative work at the Hôtel de Ville, and M. Lévy has been appointed to execute a portion of the work in the Salon des Caryatides, which had been entrusted to Cabanel, and to direct the rest of the work there.

At the Ecole des Beaux Arts judgment has been given on the competitive designs for the Achille Leclerc prize, the subject being, as before mentioned, a Pantheon in honour of illustrious Frenchmen. The designs, however, were considered so far short of the required standard that it was decided not to award the prize; "mentions" only being awarded to M. Depradelle (pupil of M. Pascal) and M. Hennequin (pupil of MM. Coquart & Gerhardt). The second competition for the Prix de Rome has also been decided by the Académie des Beaux Arts, and the following competitors have passed in the order named: M. Sortais, pupil of MM. Daubet and Girault; M. Demeré, pupil of M. Gignat; M. Cousin, pupil of MM. Coquart and Gerhardt; M. Morice, pupil of M. Blondel; M. Belest, pupil of M. André; M. Normand, pupil of MM. Normand and André; M. Depradelle, pupil of M. Pascal; M. Marcel, pupil of M. André; M. Huguet, pupil of M. Blondel; and M. Bertone, pupil of M. Gignat.

The Société Centrale des Architectes has had to regret the decease during the past month of two of its members, M. Gallois, and (as already mentioned in our pages) M. Achille Lucas, who was in his 79th year, was a pupil of Guépin senior. He entered into the Service des Travaux of the municipality of Paris in 1833, and was concerned in most of the works carried out under that department up to the present day, under the direction of Molinos, Messager, Hittorf, Davoud, Jay, and Callet. He had been engaged for some years on the construction of the group of school buildings at Tolbiac.

M. Gallois, a student of the Ecole des Beaux Arts, was appointed in 1855 architect to the Administration de l'Assistance Publique. He carried out in that capacity a certain number of

important works, especially the restoration of the "Maternité" hospital, the enlargement of the "Enfants Assistés," the Pascal Hospital, and the "Quartier des Enfants Idiots" at Bicêtre, for which he gained the Cross of the Legion of Honour.

The death is announced also of the sculptor Feugère des Forts, who for a long time had exhibited nothing at the annual Salons, but who formerly enjoyed a well-earned reputation. He was a pupil of Heim and Duseigneur, and received a première médaille in the Salon of 1864, for a plaster work, "Abel," the marble edition of which attracted much admiration in the following year, and gained him further honours. In the Universal Exhibition of 1867 he gained a medal also.

We have also to record the death of M. Chas, Donzel, a landscape painter who has for more than thirty years contributed to the Salon. Many of his water-colours were of great merit.

Our obituary catalogue includes also the names of Massard the engraver, and the painter Anastasi. Léopold Massard, an artist of talent, was the pupil of his father Urbain Massard, a celebrated engraver of the early part of the century. He executed a number of portraits, and reproduced a great many pictures, ancient and modern, among them the "Christ" of M. Bonnat, which adorns the Salle des Assises in the Palais de Justice. He has engraved, for the Louvre collection of engravings, the "Couronnement d'épines" after the picture by Titian in the Louvre. The landscape painter Anastasi, who has died at the age of sixty-seven, was born at Paris in 1820, and studied painting under Paul Delaroche and Corot; he made his *début* at the Salon in 1843, with a landscape. Among his principal works may be mentioned the "Terrasse de la Villa Pamphili," which is now in the Luxembourg, and obtained a great success in the Salon of 1864; "Un Chemin en Normandie," and "Les Bords du Tibre à Rome," which was in the Universal Exhibition of 1867. He had the misfortune to lose his sight, and, unable to paint any longer, has been forgotten of late years. He had formerly a considerable reputation as a lithographic artist, and reproduced many of the landscapes of the principal masters of the school of his period for various artistic journals. It was in this capacity of lithographic artist that he obtained a troisième médaille at the Salon in 1850.

On his death the Académie des Beaux Arts enters into possession of a capital of 100,000 francs, of which Anastasi retained the interest during his lifetime. This sum arose from a sale of his pictures for his benefit, effected by his friends when he lost his sight. He has left the money to the Fine Art Section of the Institut, charging them to make use of it for the relief of artists who should by any unavoidable calamity be left in need of such assistance; a noble and thoughtful provision which deserves to be put upon record.

**Bristol.**—A fresh set of statues, executed by Mr. Harry Hems, of Exeter, sculptor, have been placed in position on the High Cross, in the centre of College-green, Bristol. They consist of seated figures of Henry VI., Elizabeth, James I., and Charles I., in the upper range; and in the lower range of standing figures of John, Henry III., Edward III., and Edward IV. The cross, as designed by Mr. Norton, architect, was erected in 1850 by the eastern corner of the green, but was transferred to the later site of the old cross, to make way for the Jubilee memorial of the Queen. The former High Cross, one of several in Bristol, was built in the year 1373 to commemorate the city's incorporation by royal charter, dated from Woodstock, August 8, 47 Edward III. It originally stood by the Tolsey, or Toisel, at the juncture of the four main thoroughfares—Corn, High, Wine, and Broad streets. In 1633 it was raised to 40 ft. in height. Removed hence in August, 1733, it was re-erected on College-green, and finally removed thence in 1763. It is preserved at Stourhead Park, Wiltshire, the seat of Sir Henry Hoare, Bart., to whose ancestor it had been given, in 1768, by Dean Cutler Barton.

**Surveyorship, Brentford.**—The Brentford Local Board on Tuesday last unanimously appointed Mr. J. H. Strachan—who has held the post of Assistant-Surveyor for four years—to the office of Surveyor, rendered vacant by Mr. Lacey's appointment at Bournemouth. There were 119 applicants for the post.



## ANCIENT AND NEW BRIDGES ACROSS THE TIBER.

THE works now going on in Rome for the improvement of the Tiber may be divided into three kinds: First, those for the construction of embankment walls along the river; second, the building or rebuilding of bridges; third, dredging the bed of the river. The portion between the "Ponte Elio or S. Angelo" and the "Ponte Palatino or Rotto" is now completed. The embankment walls, about 100 metres apart from each other, are externally faced with blocks of travertine stone. But these indispensable works for the hygienic condition and enlargement of the town have greatly damaged many ancient monuments, especially the bridges.

The old "Ponte Cestio, or *Pons Gratiani*" (shown in our lithograph illustration), has been demolished, and in its place a totally different bridge in shape and form will be built, which will afford a better passage for the river when in flood. The announcement that the old bridge was condemned caused a good deal of excitement, and a commission was appointed in which the learned archaeologist, Professor Lanciani, represented the Ministry of Public Instruction, while the Municipality of Rome and the Board of Works were respectively represented by the engineers, Signori Azzurri and Cerruti. The commission unanimously decreed that the demolition of the ancient bridge was indispensable for many reasons, the foremost of which were the present unsound state of the bridge, the insufficient foundations of the piers, and the narrowness of the road in regard to the increased population of Rome and the increased traffic over it. Besides this, the bridge, whose central arch alone was wide and whose lateral arches were too narrow, was too great an obstacle to the free passage of the waters, especially on the occasion of floods.

It was therefore decided by the commission to remove every stone of the ancient bridge, to make measured drawings of it on the scale of 1 m. 05 to the metre, to have large photographs of it taken from all sides, and to take it down piece by piece, so as to insure its perfect and exact reconstruction. All this has been executed and only the little arch, on the right, remained to be demolished at the time these notes were written. The new bridge, which will keep the name of "Ponte Cestio," will have three large arches, the central of which (23.62 metres in span) will be the ancient arch, built up again as it originally was; but the two lateral ones will be replaced by two new arches 21.43 metres in span. Besides the old central arch, the parapet also—containing the historical inscriptions of Valens Valentinianus and Gratianus, under whose reign the bridge was entirely restored, will be built up again. Upon this parapet we also see an inscription of Pope Benedict VIII., which inscription proves that the bridge was restored in the tenth century. Underneath the parapets, the entire travertine cornice, in which an inscription is carved recording the works executed under the mentioned emperors, will be put back in its former position.

The date claimed for the original construction of this bridge is rather doubtful, but it appears that it was built between the years 60 and 36 B.C., by *Lucius Cestius, prefectus Urbis*, who was appointed by Caesar to govern Rome, when the latter started for the Spanish war, in 46 B.C. The cause of this bridge's ruin, that necessitated its re-building under the above-mentioned emperors in the fourth century, is unknown. After the time of Benedict VIII. other repairs were executed owing to the havoc made by the inundation of 1598, and under the pontificate of Innocent XI. in 1629. The ancient bridge was built of peperino and tufa stone, and the external part was entirely covered with travertine marble. The parapets were of marble of Luni. One large arch and two small ones form the waterway; the style and the construction recall the city gates which were built under Honorius, that is, with irregular blocks of travertine, badly put together.

We have been able to make two interesting observations during the works for the demolition of the bridge. At the left extremity of the bridge—that is, opposite the Tiberine Island,—were five layers of tufa blocks, forming part of the left pier of the original bridge, which was built, as observed, in the last years of republican Rome. These are the only remains of the original bridge left. The second observation refers to the re-construction which took place under Valens, Valentinianus and Gratianus, A.D.

370. At this time it seems probable that much of the material used was taken from the theatre of Marcellus, and used as building material for the bridge.

The second bridge demolished is the one called *Pons Æmilius*, sometimes *Palatinus* by the mediæval writers, which was built by the Censors M. Fulvius Nobilior and his colleague, M. Æmilius Lepidus, in 179 B.C. According to Livy, xl. 51, these Censors only constructed the piers upon which the arches were raised in 142 B.C. by the Censors P. Scipio Africanus Nasica and L. Mummius, surnamed Achaicus. It appears that the Emperor Probus rebuilt it A.D. 280. It was again destroyed by the inundation which took place in 1230 under the pontificate of Gregory IX. Pope Gregory XIII. rebuilt it entirely in 1575, after the drawings and under the direction of Matteo da Costello. This bridge was composed of six large arches bearing the arms of Gregory XIII. engraved over the piers.

This new bridge only lasted twenty-three years, for in 1598, during the flood of the Tiber, the greatest on record, half of the bridge was carried away, and the other part remained thus till last year; and this is the reason of the modern name, "ponte rotto," or ruined. It has now been entirely pulled down, except the central arch, which, quite isolated, has been left as an historical souvenir. Many decorative parts, the inscription, and Gregory's armorial bearings have been removed to the new National Museum at the *Thermae of Diocletian*.

Instead of this bridge an iron one is being built, in four spans, and supported by three piers of solid masonry faced with travertine stone. The new bridge will be 154 metres long and 20 metres wide.

An important discovery has been made above the Ponte Sisto, while dredging the bed of the Tiber. This was the fact of the existence of an ancient bridge, unknown up to now; a paper on the subject, by Signor Borsari, was published by the Royal Academy of Lincei, and in the "Bullettino della Commissione Archeologica Comunale di Roma, 1888." The only remains of this bridge consisted of the foundations at the two extremities and of two piers, the foundations of which were hidden beneath the sand. The foundations consist of masonry of flint stone imbedded with lime; the two extremities of the bridge still preserve some layers of heavy travertine blocks, bound together with crooked iron bars soldered with lead. The right-hand pier had only one layer of these travertine blocks, and the left one three. If we refer to the course of the Tiber, as it is at present, the bridge lately discovered stands obliquely, the left extremity being 102, and the right one 137, metres distant from the axis of Ponte Sisto. We, therefore, have a difference of 35.00 metres, which proves a marked inclination. But it was impossible to know in what period, or by whom, this bridge had been built, because no historical or topographical notices had been found concerning it. But during the excavations for the construction of the great drain on the left shore of the Tiber, a *cippus* of travertine was found, of 1.60 by .76 by .24 metres in size, and on whose surface the following inscription was engraved:—

PAULLUS FABIVS PERSICVS \* O. EGGIVS  
MARVLLVS \* L. SERGIVS PAULLVS \* C. OBELIVS  
BU \* \* \* L. SCRIBONIUS \* \* \* \*  
CIVATORVS RIPARVM \* ET ALVEI TIBERIS \*  
EX AUCTORITATE \* TI CLAVDI CESARIS \*  
AVGVSTI GERMANICI \* PRINCIPIS S.C. \*  
RIPAM CIPPIS POSITIS \* TERMINAVERVNT A  
TRIGABRIO \* AD PONTEM AGRIPPÆ.

From this inscription we learn that in A.D. 34, under the reign of Claudius, the embankment of the Tiber was accomplished from the spot called *Trigarium* to Agrippa's Bridge. Now, the spot where the discovery of this inscription was made lies between the ruins of the bridge recently discovered and the foundations of another bridge, a little way below the *Pons Ælius*, commonly called *Neronianus* or *Vaticanus*. But, as we know that the embankment of the shores began from the upper part of the river, and advanced towards the lower, following the river's course, doubtless this denomination of *Pons Agrippæ* can only suit the bridge discovered now above the Ponte Sisto, and about 500 metres from the spot where the *cippus* was found still in its original and perpendicular position. Agrippa's Bridge was doubtless destroyed when the Emperor Caracalla built his bridge (now Ponte Sisto). In fact, the masonry forming the foundations of the piers was found 519 metres below the low-level surface, a proof

that the bridge had been demolished so as to enable ships to pass over its ruins. Besides, if the bridge had been overthrown by floods or by some other accident, some fragments, at least, of the arches or of the superior part of the building would have been found; on the contrary, nothing but sand and clay was found even at considerable depth.

Let us now pass from the ancient to the new bridges. Four of these are in course of construction,—the Ponte Margherita, near the Piazza del Popolo, on the spot where the Aurelian's walls end; the Ponte Umberto I., leading to the centre of the new quarter at Prati del Castello; the Ponte Vittorio Emanuele, which is destined to re-unite the Vatican with the centre of the town; and the new Ponte Palatino, which has been already mentioned.

A fifth, the Ponte Garibaldi, is already finished, and it was opened to the public last year, on the 5th of June. It was built before the others, it being indispensable to re-unite the centre of Rome with the Trans-Tiberine quarters and with the new railway-station outside the Porta Portese. The Municipality of Rome decreed the building of this bridge in 1884, and the project was studied in the Municipality's hydraulic office, under the direction of Engineer Vascoli. The illustration is from a photograph of the bridge made while in progress (see lithograph). It consists of two iron arches, supported by a central pier and two abutments on the banks. The foundations were laid by means of three compressed-air caissons, which reach the depth of 18 metres below the bottom of the river. The bridge is 141 metres long and 20 wide; the foot-paths on each side take up 4 metres each, leaving 12 for the carriage-way. The spans are 55 metres each; the larger central pier is 15 metres thick, including its coating of travertine blocks. In making the foundations of the central pier there was found a bronze statue of Bacchus, of the best period of Græco-Roman sculpture, and described by Professor Lanciani in his recent and valuable work, "Ancient Rome in the Light of Recent Discoveries," pages 307, 308. "The statue," says Lanciani, "was found in an almost perpendicular position, head downwards, 16 ft. below the bottom of the river, and 26 ft. below the surface of the water. The merry god is represented in the full bloom of youth, and has a decidedly feminine type, especially in the arrangement of the long, curling hair, which is parted in the middle and fastened with a band at the forehead. The band is gracefully inlaid with copper and silver."

The modern Ponte Garibaldi is one of the most important modern bridge works executed in Italy up to now. The shape of the two arches which span the river is not a segment of a circle, but a compound curve, based on the type of Dupuy's bridge across the Tonelière, near Nantes, and of the railway bridge of Coblenz, across the Rhine. The cornice and the breastworks of the abutments and of the pier are of Baveno granite. The coating of the abutments and the central pier, the caseway, and the foundation are of travertine marble. This stone comes from the so-called "Del Barco" quarries, near Tivoli, anciently worked by the Romans, and out of which, according to Professor Lanciani's calculations, over five millions of cubic metres of travertine were taken, as is testified by the empty space between the two vertical walls of the quarry. From this "Del Barco" quarry came the travertine blocks used in the Colosseum, the Theatre of Marcellus, and other edifices of ancient Rome.

Rome, Feb. 27.

**Association of Municipal and Sanitary Engineers and Surveyors.**—The seventh voluntary pass examination of candidates for the offices of municipal engineers and surveyors to local boards, carried out by this Association, was held at the Institution of Civil Engineers on Friday and Saturday, the 29th and 30th ultimo. Eighteen candidates presented themselves for examination, the written portion of which was taken on the first day. The greater portion of the second day was occupied with the *viva-voce* portion of the examination. The examiners were: (1) For Engineering as Applied to Municipal Work, Mr. Lewis Angell, M. Inst. C.E., Past President, Borough Engineer, West Ham. (II.) Building Construction, Mr. Clement Duncombe, M.A., M. Inst. C.E., City Engineer, Liverpool. (III.) Sanitary Science, Mr. H. P. Boulhois, M. Inst. C.E., Borough Engineer, Portsmouth. (IV.) Public Health Law, &c., Mr. C. Jones, A.-M.I.C.E., Local Board, Ealing, W.



## THE BUILDING TRADES' EXHIBITION.

THE Building Trades' Exhibition, revived at the Agricultural Hall this week, though far from being as complete and as extensive as would be desirable for the adequate illustration of the numerous crafts, processes, and materials included within the scope of the building trades, exhibits a marked improvement on its two or three immediate predecessors. The Exhibition was not held last year, and we cannot but think that that circumstance has had a salutary effect upon the present Exhibition. We have often said that this Exhibition, which for several years was held annually, would have a greater chance of being really successful,—success being measured by practical utility,—if it were held at intervals of two or three years instead of annually. A three years' interval would be better than one of two years' duration. Even with the longer interval between them, exhibitions of this kind are too apt to be mere temporary shops or ware-rooms,—useful enough, no doubt, from a purely commercial point of view, but offering in the aggregate a large mass of chaff (so to speak) from which it is often very difficult, even to the most practised observer, to pick out the comparatively few grains of wheat represented by new inventions or materials, or by new modifications, combinations, or adaptations of the same. When the Exhibitions are held annually, the preponderance of chaff over wheat is even greater, for the interval between one show and another is too brief to admit of any marked and general advance. The consequence is that the same exhibits are shown year after year, and the exhibitions become little more than a series of monotonous repetitions. The present Exhibition is larger than the more recent displays of the kind, but there is a good deal of vacant space, and some of the space occupied is appropriated to exhibits that do not appertain to the building trades. As usual, many of the exhibits were not displayed or fixed in their places on the day of opening, and it was not until Wednesday that things assumed a settled aspect.

We will now proceed to mention briefly some of the typical exhibits. The letters and figures in parentheses following the names of exhibitors denote the avenue and number of the stand or stall.

Messrs. Lewis & Lewis (Bay 1), Cambridge Heath, exhibit a few wood-working machines, including the "Anerley" combined circular and band-sawing machine. Messrs. Ewart & Son (Bay 5), Euston-road, exhibit their "Victoria" ventilators. Messrs. George Waller & Co. (Bay 8), Park-street, Southwark, exhibit a combined mixer which can be actuated either by hand-labour or steam-power. They also exhibit a very complete set of drain-cleaning tools, and sundry fittings in constant requisition in sanitary work. Messrs. Scott & Co. (Bay 10) exhibit Archer's patent drain-pipe, which has already been described and illustrated in the columns of the *Builder*. The Machine Exchange Company (Bay 14), Edgware, exhibit a 10-h.p. portable engine; a builder's hoist; and other items of plant. The London Engineering Company (Bays 24 and 25) have a large display of a miscellaneous character, but chiefly consisting of gas-engines, gas-stoves, and fittings.

Mr. Robert Adams (A 1), Newington-causeway, exhibits his "Victor" spring-hinges, patent sash-gear for reversing the sashes for cleaning, casement-stays, fanlight-openers, &c. Mr. H. A. Ball (A 4), Chiswell-street, exhibits a telescopic fanlight-opener. Mr. Thomas Kemp (F 160), Brixton, exhibits a very good form of water-closet, which he calls "the Unique." The flushing arm is of special form, and is so introduced direct from the flush-pipe into the pan as to need no putty, red-lead, or any other composition to make a joint. Messrs. C. Kite & Co. (A 6), exhibit, among other ventilators, the new patent "Simplex Water-Jet Air-Propeller," a new adaptation of the use of a water-jet for the purpose indicated. The jet is of peculiar construction, and can be so fixed as to direct the water upwards, downwards, or horizontally.

The Liwyd-coed Slate Quarry Syndicate (Limited), of Penygroes, North Wales, exhibit (Stand A 8) some specimens of green Bangor slate of very good colour and excellent cleavage. At the same stand is shown Gilmore & Clark's patent "Scientia" lock, which contains three pieces only; it is devoid of any spring, and can be securely bolted.

Messrs. W. R. Dell & Son (A 10), of Mark-

lane, exhibit two or three of Cleathero's patent silent-action lifts. They are self-sustaining, retaining the cage in any position in which it may be left, even though bearing its maximum load, without the aid of a brake.

Messrs. W. & R. Leggett (A 12), of Bradford, exhibit their admirable appliances for opening fanlights, skylights, &c. Messrs. Richard Johnson, Clapham, & Morris (A 13), of Manchester, show Johnson's patent fireproof wire lathing,—a substitute for wood laths. The Asphaltic Limestone Company (A 14), of Queen Victoria-street, show samples of asphaltic concrete and Limmer asphalt. Messrs. Joseph Robinson & Co., Limited (A 17), of Carlisle, exhibit their fireproof cement for plastering, concrete floors, &c.

Mr. Mark Fawcett (A 18), of King's-road, Chelsea, exhibits his patent fire-proof tubular lintels as used by him for constructing fire-proof floors, flat roofs, ceilings of strong-rooms, &c. This system of fire-proof construction, which was recently described in our columns, possesses the merits of lightness, strength, and cheapness. The Adamant Company, Limited (A 23), of Birmingham, show specimens of their "Adamant" plaster in slabs, as well as in mouldings, enrichments, &c.

Millar's Patent Reversible Window Co., Limited (B 43), of Queen Victoria-street, exhibit window-frames and sashes fitted with Millar's patent hinges and joints.

Turpin's Parquet Floor, Joinery, and Wood Carving Co., Limited (B 50), Queen's-road, Bayswater, make a very good display of parquet flooring, also some joinery and a chimney-piece and over-mantel.

Stuart's Granolithic Paving Co., Limited (B 52), of Limehouse, exhibit their well-known specialty.

Messrs. King & Smith (B 54), of Weedon, have on view a stack of their patent "honey-comb" wine-bin; each tube or cell takes one bottle, and not only protects it from breakage, but ensures for it equality of temperature.

The Boatwick Gate and Shutter Company (B 55), Queen Victoria-street, exhibit some forms of their very ingenious arrangement of folding-gates and shutters. For lifts opening on to narrow landings, where ordinary gates would be in the way, these folding-gates are the very thing.

Mr. Henry Bassant (B 56), Charlotte-street, Fitzroy-square, has an admirable display of parquetry. Mr. H. J. Rust (B 57), Battersea Park-road, exhibits some specimens of vitreous mosaic work.

Mr. Joseph Westwood (C 72), of Millwall, shows Hawksley's patent treads for stairs, as well as hydrant-covers, cellar-flaps, and other surfaces subject to heavy traffic, constructed on the same principle as the treads. Mr. C. G. Roberts (C 77), Haslemere, shows his rain-water separator,—more than once described by us. Messrs. Shanks & Co. (C 80), Barrhead, Glasgow, have a representative group of their various sanitary fittings and appliances. Messrs. N. C. Szerelmey & Co. (C 81), Victoria Embankment, exhibit their iron and porcelain paint and stone preservative liquids.

Messrs. Mainzer & Kempthorne (D 101), Hart-street, Bloomsbury, have a large display of marble mosaic work. They also show a specimen of granite mosaic pavement, which is worth attention. The Calcorin Decorative Company, Limited (D 103), exhibit specimens of some effective wall decorations in their material, which is meant to be a substitute for leather.

Messrs. Frederick Jones & Co. (D 106), Perren-street, Ryland-road, exhibit silicate cotton or slag-wool in some of its varied applications in connection with fire-proof, sound-proof, and vermin-proof structures.

Mr. Rowland Hodges (D 108), of Birmingham, exhibits Hill & Hodges' patent floor-spring hinges, and a variety of window, door, lock, and bell furniture. Moule's Earth Closet Co. (D 109), Garrick-street, exhibit their appliances in various forms. Messrs. Edward Smith & Co. (D 112), Coalville, Leicestershire, exhibit terra-cotta, floor-tiles, wall-tiles, and decorative faience. Messrs. Le Grand & Sutcliffe (D 122), of Bunnhill-row, exhibit their Abyssinian and artesian tube wells. Messrs. J. & E. Goad (D 124), Plymouth, exhibit an interesting collection of specimens of various Devonshire marbles.

Messrs. Brown & Green (E 133, 134), of Finsbury-pavement, have a good display of heating stoves, kitcheners, and cooking-stoves; they also show "Brown's Springless Rim and Mortise Locks." Messrs. Gisholm & Robson (E 136),

Sunderland, exhibit a noiseless extractor ventilator for dwelling-rooms. It is intended for insertion in the chimney-breast, near the ceiling, and is without a flap. In order to ensure the efficiency of the extractor, there is placed in the chimney-flue, from 6 in. to 12 in. below the ventilator, a cast-iron contractor or diminisher, for accelerating the upward draught from the fire as it passes the inner face of the extractor. Mr. F. A. Fawkes (E 137), Chelmsford, exhibits a door with architrave and portions of a dado,—good specimens of joinery, with enriched mouldings. Radeke's Decorative Wood Company (E 138, 139), Coleman-street, exhibit specimens of their decorative woodwork, which is now produced by a new process. When we noticed this company's productions on a former occasion, the finished article consisted of a moulded or stamped veneer backed by a composition made from sawdust or wood-pulp. By the new process, the ornament, such as that of egg-and-tongue and other enriched mouldings, is compressed out of the solid wood, so that there is no veneer, and the material is now rendered waterproof, making it available for the decoration of steamship saloons, &c. It is very cheap compared with actual carved work, but very tame and ineffective, because the effect obtainable by undercutting is altogether absent. The patentees are particular in pointing out, in a letter addressed to us with some samples, that this decorative woodwork is "not intended to be imitation carving"; but it has the effect of being so intended, looking, as may be inferred from what we have said, like rather tame carving sandpapered down into a general smoothness. It will be useful, no doubt, to those who desire to get up something looking like wood decoration *en masse* and very quickly and cheaply, but it could never be accepted for high-class work.

Mr. Henry Hope (E 143), Birmingham, exhibits various samples of wrought-iron weather-tight casements, a hot-water radiator, coil-cases, &c. Messrs. Shelley & Co., also of Birmingham, cover these exhibits with a light span-roof glazed on their "Unique" system. Messrs. Broad & Co. (E 149), of Paddington, have some very excellent sanitary specialties in white enamel ware. Mr. Samuel Elliott (F 162), of Newbury, has a good show of very well-executed moulding and joinery work. Mr. Andrew Smith (F 168), East Dulwich, exhibits a useful improvement in Venetian blinds, whereby the head-piece is substituted by fittings which enable the blinds to be removed and replaced in a few seconds, no side cords being necessary for altering the lateral position of the slats. Messrs. R. W. Hitchins & Co. (F 169) have on view several new and useful combinations of plaster with slag-wool, iron and wire netting, applied to partitions and ceilings with a view to deaden sound as well as to prevent the spread of fire. Messrs. T. Baillie & Co. (F 173), Wardour-street, exhibit specimens of their new method of glass decoration, "translucid vitreous enamelling," as they call it. We have spoken of it on a previous occasion.

At the east end of the hall (Stand No. 199), the Lucigen Light Company have a large and important exhibit, which, we understand, is a duplicate of the one they are preparing for the International Exhibition in Paris. The chief feature of interest is a portable lucigen of about 2,000-candle power, which is self-contained, worked by means of a steam jet generated by the heat of the flame itself, which also converts the oil into a gas and produces a brilliant flame without any waste of oil, and without the production of any spray whatever. The gas being generated in what may be termed an open reactor, there are no tubes which can choke up with the products of distillation. Common tar-oil, shale-oil, or creosote-oil can be used, a special oil not being necessary. The same arrangement of lamp can be used by connecting it to any existing steam supply, thus dispensing with the water-tank and air-pump; the light is therefore applicable in cases either where steam is available or where it is not. The portable or self-contained lucigen is, of course, entirely independent of any steam supply or outside motive power. For contractors use this new form of the lucigen light is likely to be in great demand. The exhibit also comprises complete sets of the ordinary lucigen plant, as used for permanent installations. The "Pyrogen" furnace shows the application of the lucigen as a rivet-heating furnace.

Messrs. Houghton Brown Bros. (South side, 205), Balls Pond, exhibit some useful plant for



contractors' purposes, including a combined horizontal engine and 6-ft. mortar-mill.

In the Arcade leading from the main entrance to the Hall, Messrs. Chambers, Monnery, & Co. have a large display of builders' ironmongery of all kinds, including wall-ties, stoves, and ranges. Specially worthy of mention under this head are the "Bishopsgate" ranges, one form of which is made with a well-devised raising fire-grate and a lift-out boiler. The patent "Movable-Canopy Grate," with what is known as the "Teale" fire-back, enables the canopy to be lowered at pleasure so as to give room for sweeping the flue,—an operation ordinarily very difficult with these "lean-forward" firebacks when used in conjunction with fixed canopies.

The Exhibition remains open until Saturday next, April 13.

#### LIVERPOOL EXHIBITION OF DECORATIVE AND APPLIED ART.

At the Walker Art Gallery, in five of the rooms usually devoted to the autumn exhibition of modern pictures, are gathered together the various objects which are comprised in the display of what is called "Art workmanship," or arts and crafts.

As is set forth, this show is to make known the many beautiful designs, processes, fabrics, and wares generally that are now being produced in the United Kingdom; to encourage art workers; to arouse a spirit of emulation amongst the manufacturers, and to elevate the taste of the public.

It is evident that the Arts and Crafts Exhibition held in London last year has inspired the Liverpool Art Committee to follow in its footsteps, and it has also been laid under an obligation by the contributions of the works of several of the leading supporters of that exhibition, such as Mr. Walter Crane, Mr. Burne Jones, Mr. Holiday, and others with well-known names. Thus we see here the "Skeleton in Armour," and fine designs for mosaic, &c., by Mr. Walter Crane; cartoons of "The Day of Judgment," "Rivers of Paradise," and the "Woman of Samaria," by Mr. Burne Jones; cartoons, &c., by Mr. Henry Holiday; one worked into silk by Mrs. Henry Holiday; designs many and various by Mr. Lewis F. Day,—those of his executed by Messrs. Maw & Co., the tile manufacturers, being successful in their lustre and general fine effect. And Messrs. J. H. Pollen, Heywood Sumner, C. W. Whall, Mr. W. Webb, and others, furnished several specimens of practical design.

To our mind the pleasantest and most instructive contents of the rooms are to be seen in the beautiful old pieces of furniture and decorations lent by Mr. Donaldson, of London, and in those on loan from the South Kensington Museum collections. Mr. Donaldson sends a fine historical cabinet in ebony, which was presented to Rubens by his pupils. Vandyck, Jordans, Snyder, &c., who painted on it several interesting scenes. Also a fine Dressoir, and two grand chairs of the sixteenth century. The South Kensington Museum contributes, besides beautiful furniture, cases containing electro reproductions of the well-known old plate, which has been in its possession now for some time.

Many of the walls of the rooms are hung (and gain much advantage thereby) with drawings by students of the South Kensington School of Art. Many of these drawings are coloured photographs of Sir Richard Wallace's rare furniture, on loan at Bethnal-green, and have been so carefully painted in fac-simile by the students, as to be very valuable for reference.

Nothing could be better for the furtherance of the improvement so much talked about in decorative art than the bringing together of first-class examples of old work in the same galleries with the several specimens of modern emulation. It was a happy idea which thus struck the promoters, as comparison must at once bring conviction to the present artists and exhibitors that, they have still much to learn in refinement, drawing, and power, especially when their work is brought side by side with specimens of the best days of the Renaissance.

A great many of the modern exhibits have a little too much of the flavour of the show-room; but there are works displayed which show, on the part of the exhibitors, good design, carried out with excellent workmanship.

The Leek Embroidery Society, the Lywick

Art School, Keswick (note its beaten dishes), the Toybee Hall School and Guild of Handicraft, the Donegal Industries Society, and similar societies, occupy much of the space on the walls of the gallery.

Amongst the general exhibitors are Messrs. Trollope & Sons, London and Liverpool; Jones & Willis, Birmingham and Liverpool; S. T. Waring & Sons, Liverpool; Urcubart & Adamson, Liverpool; Turner, Son, & Son, Liverpool; Messrs. G. H. Morton & Son, Liverpool; Staunton & Son, Liverpool. Wall-papers are well represented by the exhibits of Messrs. Woolmans & Co., Jeffrey, Arthur, and others. Messrs. Elkington have a large show-case, and Messrs. Doulton & Co. contribute their well-known exhibits.

Carpets of Scotch manufacture by Messrs. Templeton, and of Indian and Eastern manufacture, imported by J. & R. Smith, of Liverpool, are pleasing and interesting.

#### REPORT OF THE EDUCATION COMMITTEE OF THE INSTITUTE.

THE following is the preamble of the Report of this Committee, which is to be considered at the Special Meeting of the Institute on Monday evening, and to which reference is made in our "Notes" column of the present issue:—

"The Special Committee appointed in 1886 to consider the subject of Architectural Education have devoted much time and labour to this inquiry, and have collected a considerable amount of information respecting the educational institutions affording opportunities for architectural study, which, when completed, your Committee propose to lay before the Council.

"Recently, however, the attention of your Committee, which would otherwise have been concentrated on this subject, has been occupied in consideration of the special reference to them 'to consider and report upon the manner in which the resolutions of the Conference of May 4th, 1887, could be carried out.' They now beg leave to report to the Council on this special reference.

"Your Committee have drawn up a general scheme for the three Examinations suggested by the Conference. Should the scheme be approved by the Council, they recommend that it be submitted to the Institute with as little delay as possible, in order that, if also approved by the General Body, it may be communicated to the Local Societies allied to the Royal Institute of British Architects, with the view of the details by which it may be carried out being considered in conjunction with the Councils of those bodies.

"This scheme, which is set forth in the following pages, is based on the idea:—

(a) That a Preliminary Examination should test the general knowledge of aspirants about to enter the profession, thus setting a standard, and directing education into channels likely to be useful.

(b) That an Intermediate Examination should, by means of drawings submitted, prove that the candidate has been diligent in his studies, and has acquired a certain proficiency as a draughtsman; and that its written and oral portions should test his knowledge of the elementary principles and practice of architecture both as an Art and a Science. The drawings required will be a selection only of those which a youth of ordinary attainments may reasonably be expected to produce in the first few years of his pupillage; while, as will be seen from the list of books recommended, the written portion will be on elementary subjects essential to form the foundation of more complete knowledge, but yet easy to acquire within the period of pupillage.

(c) That a Final Examination should take the place of the present Obligatory Examination, of which it is a development; the student having been well prepared by passing the Intermediate, the Final Examination to qualify for candidature as Associate R.I.B.A. will take a higher range than it does at present, and thus produce more satisfactory results than can ever be attained under the existing system.

"Careful observation of the working of the present examination has governed the details now submitted to the Council, which will be found, on consideration, to involve no greater amount of study or work, on the part of candidates for admission to the Royal Institute, than should be required from young men of moderate ability.

"With a view to the proper comprehension of the scope and limit of each progressive examination, and to assist the candidate in his preparation, a list of books has been drawn up under each subject. These lists are annexed to the programme, but it should be clearly understood that the books named are suggestive only, and that the candidate will be at liberty to acquire the necessary information from any sources available to him,—especially from classes and lectures, and from the study of buildings, ancient and modern or in course of construction,—as the examination must be such as to

necessitate accurate professional knowledge, and not a mere acquaintance with specified text-books.

"It is evident that a considerable time must elapse before this scheme can be brought into complete working order, and that there will be a large number of the younger members of the profession, and even many who may have been some years in practice, who, while desirous of qualifying for membership of the Institute, can scarcely be expected to come within the range of these progressive examinations. The Obligatory Examination, as at present conducted, with the privileges attendant thereon, has been so successful, and meets so completely the requirements of the classes of young architects referred to, that your Committee recommend that it be continued on the same lines, and with the same privileges attached, for at least three years after the establishment of the system of progressive examinations; and they also recommend that, for a further period to be determined by experience,—which will probably be for another three years,—the Final Examination alone be considered sufficient for those whose age may exceed twenty-three years, and who produce satisfactory evidence of proper professional education.

ARTHUR CATES, Chairman of the Committee.  
JOHN SLATER, } Hon. Secs. of the  
FRED. R. FARROW, } Committee."

#### OBITUARY.

*Mr. Charles Bowyer.*—The death is announced of Mr. Charles Bowyer, aged 46 years, an Alderman and well-known builder, of Croydon, and we much regret to have to record the event, owing to the peculiarly distressing circumstances attending it. Alderman Bowyer was a partner in the firm of Messrs. J. & C. Bowyer, builders and contractors, of Upper Norwood and elsewhere. They were engaged in an extensive way of business, having erected several churches, chapels, and other buildings in and around Norwood and its vicinity. Among the buildings erected we may mention a large house known as "Thurlow Towers," Tulse Hill, erected by this firm for Mr. Michael Pope, from designs by Messrs. Batterbury & Huxley, architects, and illustrated in the *Builder* for Nov. 22, 1884, and Nov. 23, 1884. The deceased had been staying at Brighton some weeks, for the benefit of his health; he was suffering from dyspepsia caused by gall stones, and this produced a very depressed condition, so much so that he was ordered to be closely watched. He, however, managed to throw himself off Black Rock, Brighton, and was killed. The jury at the coroner's inquest, after a short deliberation, returned a verdict of "Suicide whilst of unsound mind."

**The Sanitary Institute.**—The next Congress and Exhibition of this Institute will be held in Worcester, at the end of September next. Arrangements are in progress, and will be published shortly.

**The English Iron Trade.**—The English iron market is buoyant, the upward movement extending to almost all branches of the iron trade. Pig-iron is going up unmistakably, although, with the exception of Bessemer iron, of which the consumption is exceptionally heavy, there is no extra demand beyond the present liberal requirements on the part of finished iron and steel manufacturers. The Glasgow warrant market has been exceedingly active this week, the prevailing briskness being not so much the creation of speculative buying as the result of the needs of consumers. The gain in warrants has been about 6d. on the week, but Scotch makers have advanced their rates from 6d. to 1s. 6d. a ton. The principal upward movement this week has been in Cleveland iron, which has increased in value quite 2s. a ton, makers holding firmly to 40s., with merchants quoting 39s. The rise in the value of pig-iron in other districts is also pronounced. Bessemer iron in the north-west is quoted 1s. higher, while on the east coast makers of hematite want 2s. a ton more. Manufactured iron is as active as last week, and prices are moving upwards in sympathy with pig-iron. Some Scotch makers of branded bars are asking 5s. a ton more. Tin-plates are improving both in demand and firmness. The call for steel is as pressing as ever, beyond the capacity of producers, and prices are very strong. For prompt delivery orders can only be placed at above current rates. The outlook in the shipbuilding trade continues most satisfactory, while the engineering and related branches are prosperous.—*Iron.*



## Illustrations.

## ANCIENT AND MODERN BRIDGES OVER THE TIBER.

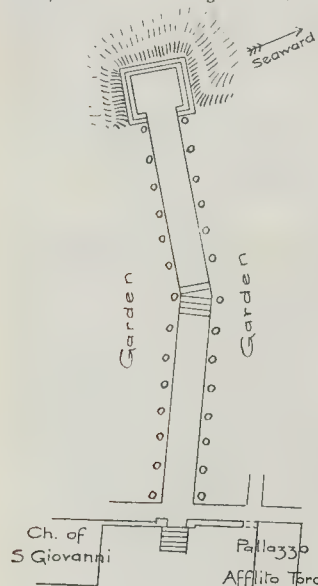
THESE views of two ancient bridges now removed, and of a modern one in progress, are reproduced from photographs. They are described in an article in another column.

## A CENOTAPH.

THE cenotaph of which we give an illustration is an example of the application of native Indian art by a European hand. It was designed by Mr. R. F. Chisholm. This monument, for a well-known Indian potentate, was to be constructed entirely of Muckrans marble, the openings being embellished with perforated designs of the same material, designed in the spirit of the Ahmedabad work. The structure was intended to occupy a central position, and the four-angle domes would have afforded rest and shade for pedestrians. Ultimately the design was abandoned on account of its costliness.

## MARBLE PULPIT IN THE DESERTED CHURCH OF A SOUTH ITALIAN VILLAGE.

THIS pulpit is in S. Giovanni, at Ravello—a place of great importance in the Middle Ages, but now most scantily populated, in the hills immediately above Amalfi, and from whence a very grand view of the Gulf of Salerno is to be had. In it are several churches, mostly deserted, and a cathedral containing many things of great interest. A very large marble pulpit, by Nicolo di Bartolomeo, resting on six twisted and inlaid shafts borne on the backs of lions, more powerful than those at Pisa or Pistoja; a bishop's throne, the side of which is inlaid with a prowling beast or dragon, and an ambo inlaid with terrific green monsters, one in the act of swallowing the preacher and prophet, Jonah, and the other vomiting him forth.



Plan of Vine-walk, Ravello.

This apparently was a favourite subject with the old artists, as the pulpit in S. Giovanni (see illustration) has a panel devoted to it, and no doubt, the fondness for it was due to the fact that then, as now, some proportion of the inhabitants of the place were fishermen, or otherwise lived by the sea.

The bronze doors of fifty-four panels, twenty-seven to each leaf in rows of three, were cast by Barisano, of Trani, who made the bronze doors for Monreale and Trani (1160-1179).

Ravello has also a curious Saracenic palace, and the remains of a Byzantine one, the Palazzo Affitto Toro, with an interesting garden.

The pergola, or vine-walk, with stone piers on either side, is of some length; half-way one ascends a broad flight of half-a-dozen steps. Here the perspective suddenly changes, so that both ends of the walk are only to be seen from the middle, or rather the distant end of the walk is never visible at whichever end one stands. This has been done for no other reason than the effect. The walk terminates in a widened-out space, surrounded by a low wall and stone-seat, where one can rest and enjoy the grand view, seaward and inland; the ground outside the low wall falling very precipitously.

The district is a rich one artistically, as it is famous for its natural beauty, for Salerno, Amalfi, La Cava, and Atrani all have either bronze doors or marble pulpits of the same date as the example now illustrated, I believe, for the first time.

J. A. S.

## NEW PUBLIC BATHS, HAMPSTEAD.

THIS building, of which we gave some particulars in the *Builder* for June 7 of last year, has since then been open for one season, and is said to have proved most successful in its working, besides being (what many public baths are not) a building of picturesque exterior.

In regard to the interior arrangements, it may here be added that each set of baths is *en suite*, and is complete in itself. The waiting-rooms being placed between the swimming-baths with their respective private baths are very convenient for bathers using one or the other, or both, and favour economical administration, whilst good oversight is secured over the baths. The swimming-bath for ladies is found to be too small, and additional land has been secured whereon it is proposed to build a larger bath, when the present one will be used as a second-class bath. It has been rather too generally assumed in the planning of swimming-baths that less size is required for the women's than for the men's swimming-baths. This is still the case, probably, in swimming-baths intended chiefly for what are called the lower classes; but among the more educated classes athletic exercises of all kinds that are suitable for women are receiving such increasing attention from ladies, that in any residential neighbourhood of the better class it may now be assumed that women are likely to require as much swimming-bath accommodation as men, and that the idea of a small kind of subsidiary swimming-bath for ladies is an exploded fallacy.

The architects of the building, as mentioned in our former notice, are Messrs. Spalding & Auld.

## HOUSE, SAN REMO, ITALY.

THIS house, about to be erected for Dr. Freeman, has been specially designed to meet the exceptional requirements of the district, and to offer the greatest possible resistance to the action of earthquakes.

The building has been purposely kept low in height, and the whole of the upper part is of timber framing, pegged together with oak. Similar construction has been found the most successful in Northwich and similar districts where subsidences are of frequent occurrence.

The architect is Mr. R. Knill Freeman.

## HOLY TRINITY CHURCH, SOUTH SHORE, BLACKPOOL.

THIS church is being erected on the site and in place of a smaller brick building, and will, when completed, provide about a thousand sittings. The first contract, now approaching completion, is for the chancel, chapel, vestries, transepts, and first three bays of nave, and it is hoped that the remaining portion of the nave and the tower, &c., will be added at no distant date. The materials are Yorkshire stone for the walling, with red sandstone for the dressings. The inner ceilings are of wood vaulting. The contractors for the works now in hand are Messrs. Moore Bros., of Rawtenstall, and the cost about 5,000l.

Mr. R. Knill Freeman is the architect.

**Wollaton Hall.**—The *Builder* for April 13 will contain a complete set of measured drawings, ten plates in all, of this celebrated example of English Renaissance architecture, accompanied by sketches of details; the whole drawn by Mr. Percy K. Allen, of Nottingham. We believe there are no complete published illustrations of Wollaton Hall in existence at present.

## FIRE-PROOF FLOORS.

At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on Monday evening last, Mr. Jonathan R. Baillie, President, in the chair.

The following paper on "Fire-proof Floors" was read by Mr. G. M. Lawford, Assoc.-M. Inst. C.E.:

The subject of fire-proof flooring is apparently one of great antiquity, for the Romans in the time of Julius Caesar were in the habit of making their floors and roofs, as well as their walls, of concrete. From an article in vol. II. of *Archæologia*, in the possession of the Society of Antiquaries, it appears that large beds of pozzolana existed over the area of the Campagna. This substance, as is well known, when mixed with lime, forms a natural hydraulic cement of great cohesive power. The lime employed was obtained by burning "travertine" (lapis Tiburtinus), and the other ingredients of the concrete usually consisted of broken lumps of tufa for walls and ordinary foundations; of broken lava when foundations of great strength were required; and of lumps of broken pumice for arched roofs and vaults where lightness was essential. The floors were constructed of large slabs of concrete resting on sleeper walls of brick, 2 ft. 9 in. high and about 14 in. thick, set in clay, and placed about 3 ft. apart; a layer of finer concrete was spread over the slab, and mosaic paving was bedded thereon. The roofs were made flat, and supported on brick pillars. It is apparently a matter of question whether flat centering was used, or concrete slabs in the manner described.

Coming nearer to our own times, up to the middle of the eighteenth century fire-proof flooring seemed to consist only of the brick arch, with its accompanying disadvantages of enormously thick walls and great cost; but, towards the close of that century, cast-iron girders and segmental brick arches were gradually coming into use for warehouses and floors where strength was essential.

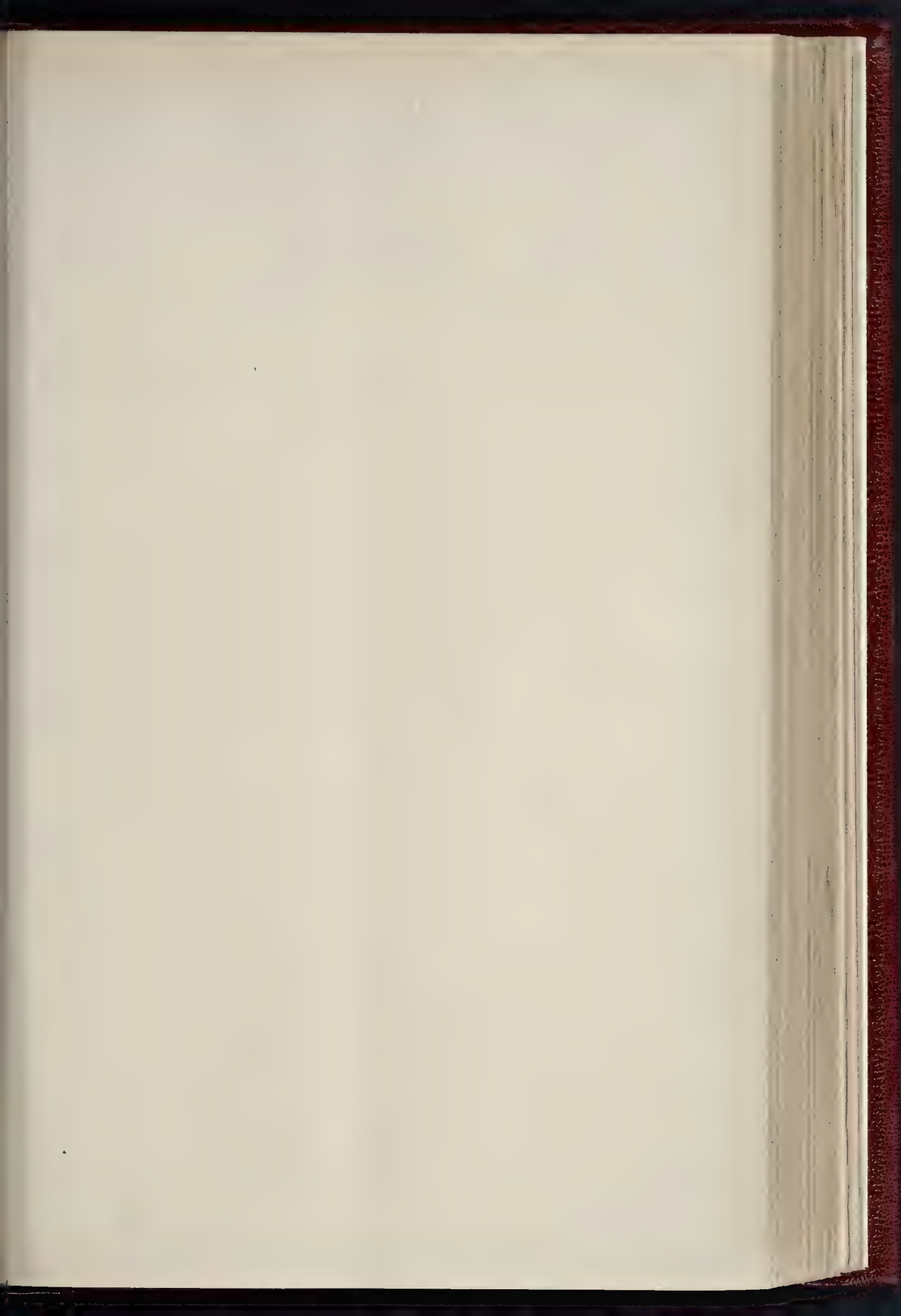
In 1778, Earl Stanhope, in a paper read before the Royal Society, described his invention of pugging for rendering wooden floors fire-proof; but this had, in a way, been preceded by the floors used in Nottingham and the surrounding districts in the seventeenth century, formed entirely of bundles of reeds, covered with a thick layer of coarse gauged gypsum, and plastered below with the same material. In Earl Stanhope's floor fillets were nailed to the joists at about one-third of the height, laths were laid on the fillets and plastered above and below with a mixture of lime plaster and chopped hay; a liquid grout was run over both sides, covering the fillets and forming a fire and air proof slab. The undersides of the joists were then lathed and plastered to form the ceiling. About 1820, wrought-iron joists began to take the place of the cast-iron girders, and the arch was reduced to a single half-brick ring, concreted over the haunches. This was followed by a concrete floor, designed by a Dr. Fox, of Bristol, about 1830, in which wooden fillets were laid on the lower flanges of rolled joists and concreted over. This floor, known as the "Fox and Barrett" floor, was the subject of a paper read before the Institution of Civil Engineers by Mr. Barrett in 1849; and here it may be remarked that, although the subject is common ground to both engineers and architects, an interval of forty years has been allowed to elapse without the subject being reopened before the Institution, while the present paper is the first on the subject that has been read before the Society of Engineers.

A description of the "Fox and Barrett" floor will be given later, but it should be observed that this floor was the first in which an attempt was made to protect the exposed faces of the iron joists with a fire-resisting material.

In 1845 the late Sir Henry Hunt brought in a system of arching, in which the arch was composed of tiles and cement resting on rolled joists. In 1862 Messrs. Measures introduced an improved modification of the "Fox and Barrett" floor, known as Phillips's floor, in which tee-iron bearers, 9 in. apart, were substituted for the wooden fillets, and this was followed by the different developments and applications of wrought-iron and concrete now in general use.

The objects of fire-proof flooring are:—To render each floor capable of resisting the effects of fire, and, by so doing, to divide the building into a series of compartments, so that fire can neither be communicated from one compartment to another, nor from one story

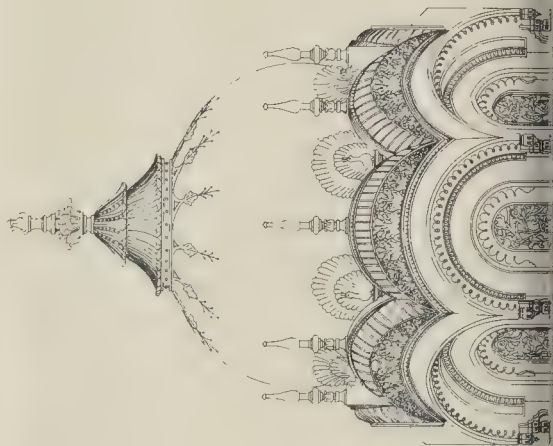
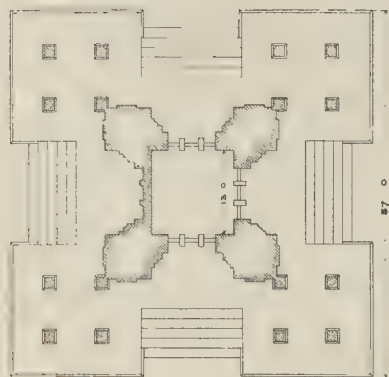




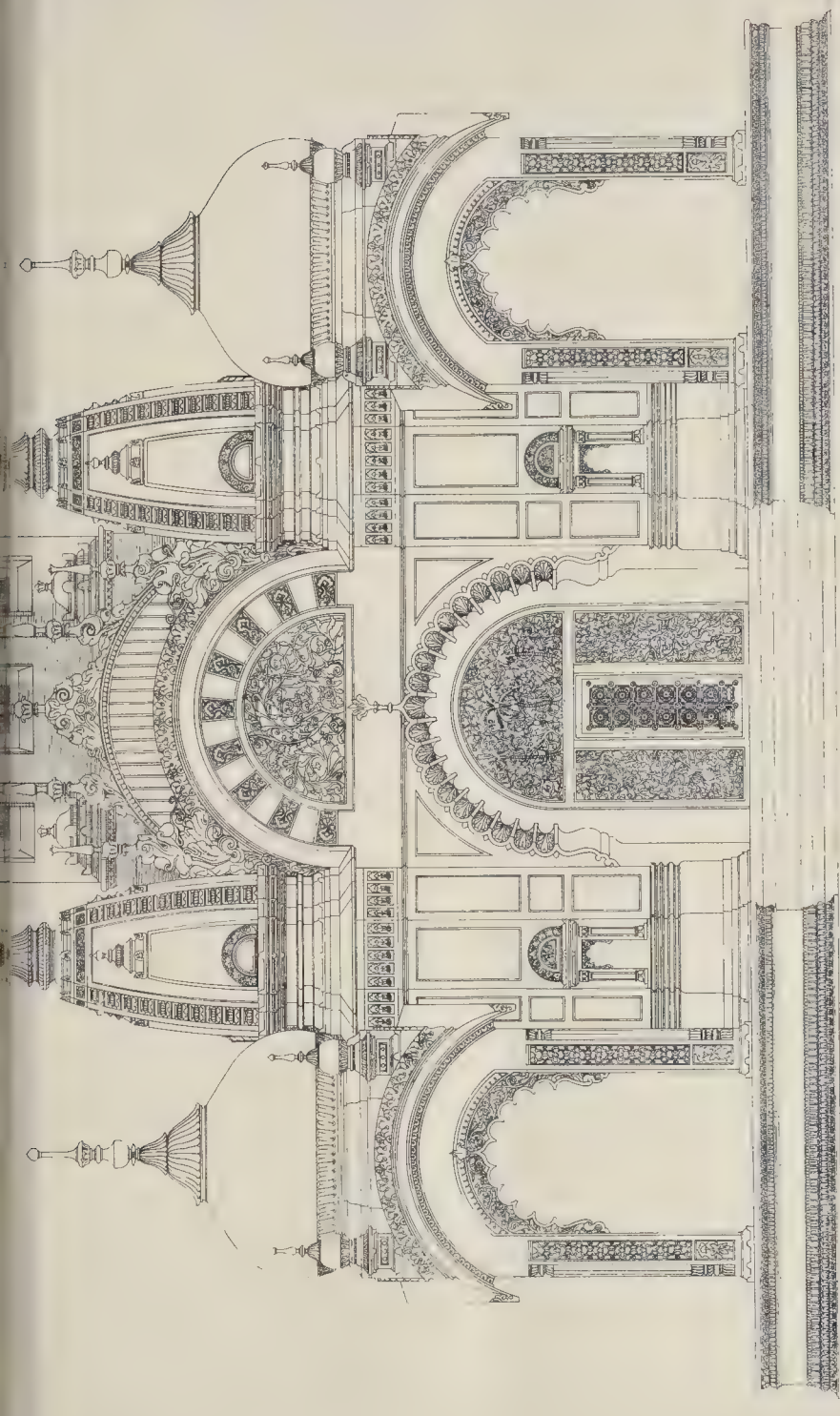
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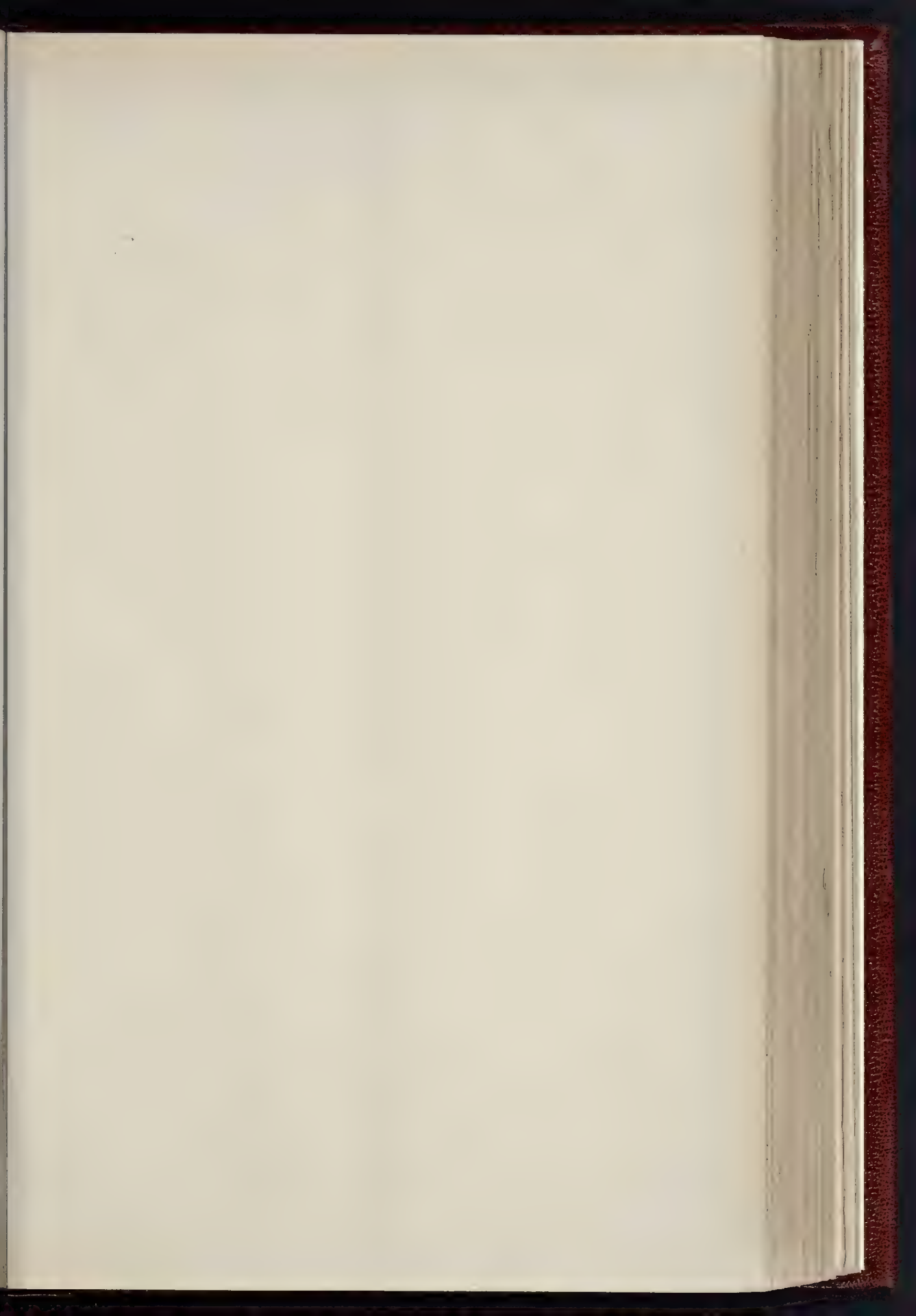




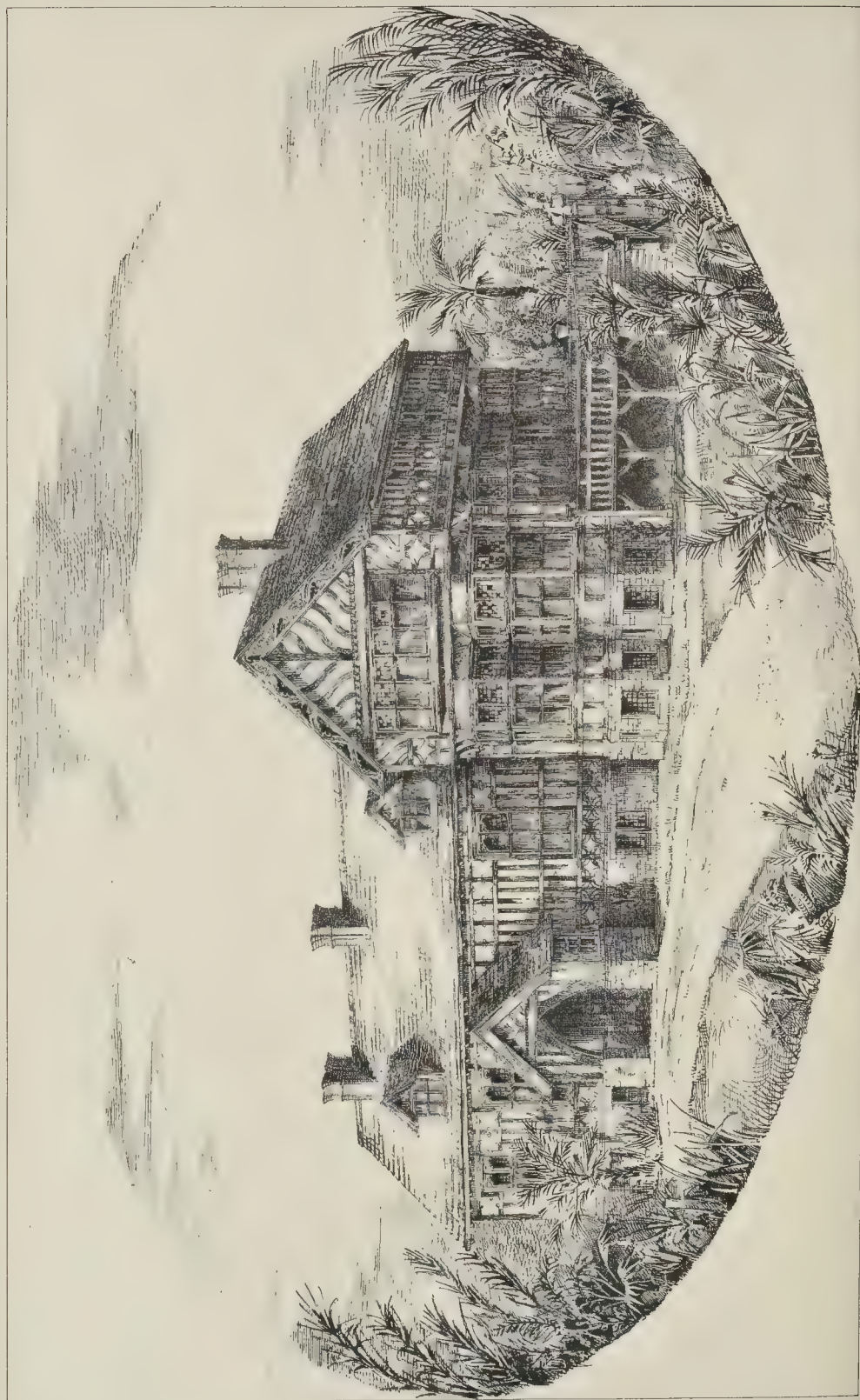
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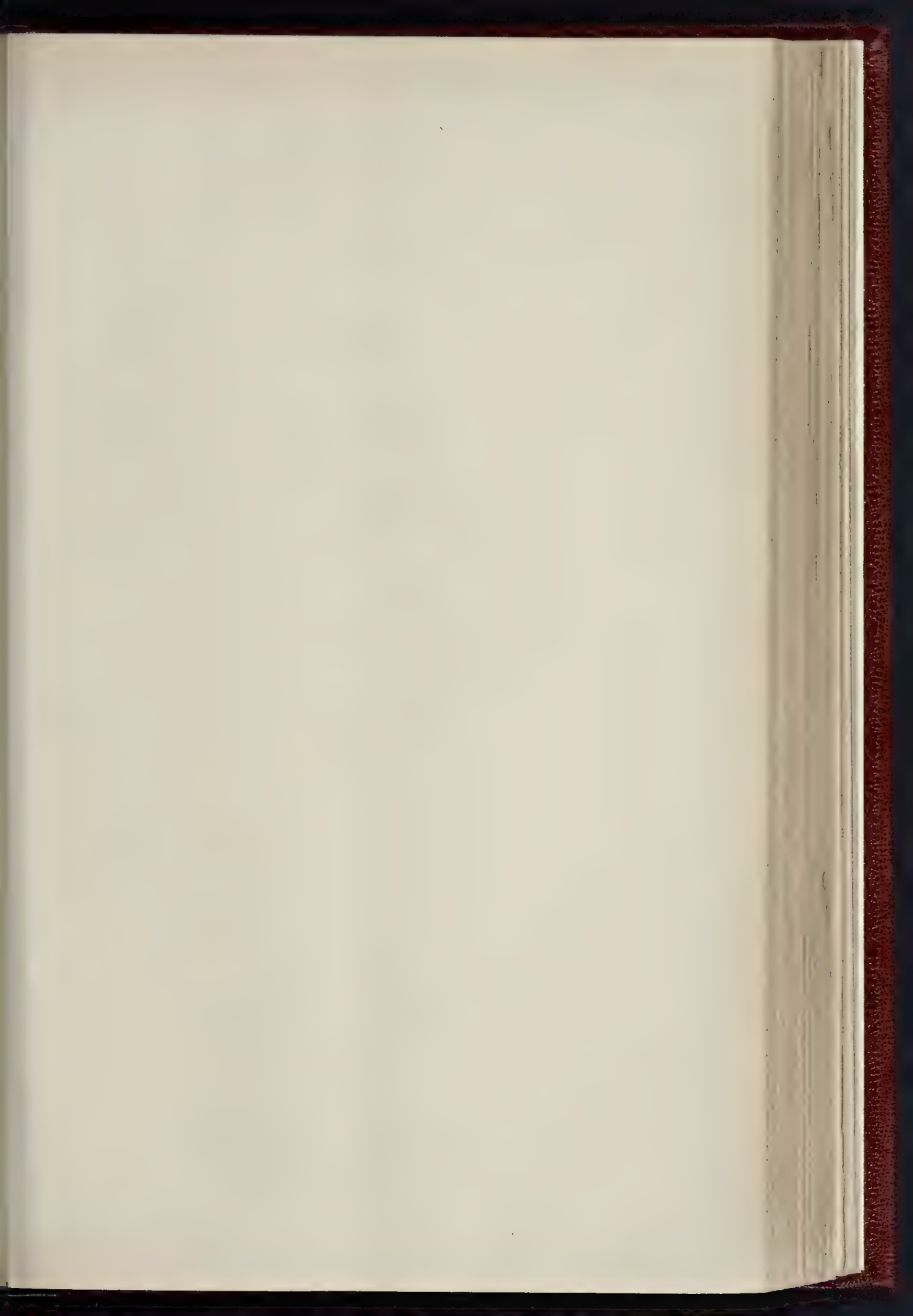
THE BUILDER, APRIL 6, 1889



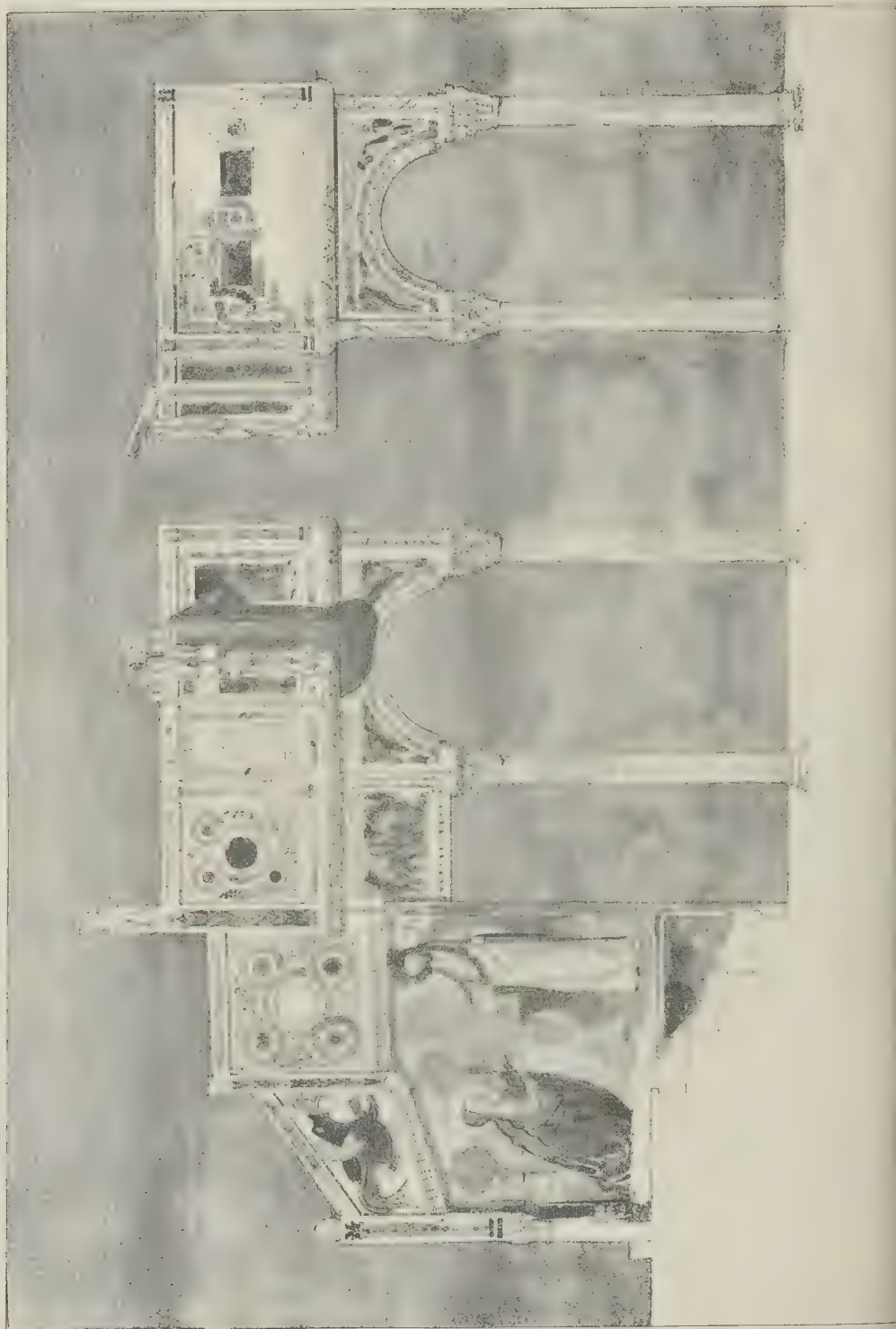
HOUSE, SAN REMO.—MR. R. KNILL-FREEMAN, F.R.I.B.A., ARCHITECT.

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THE BUILDER, APRIL 6, 1899





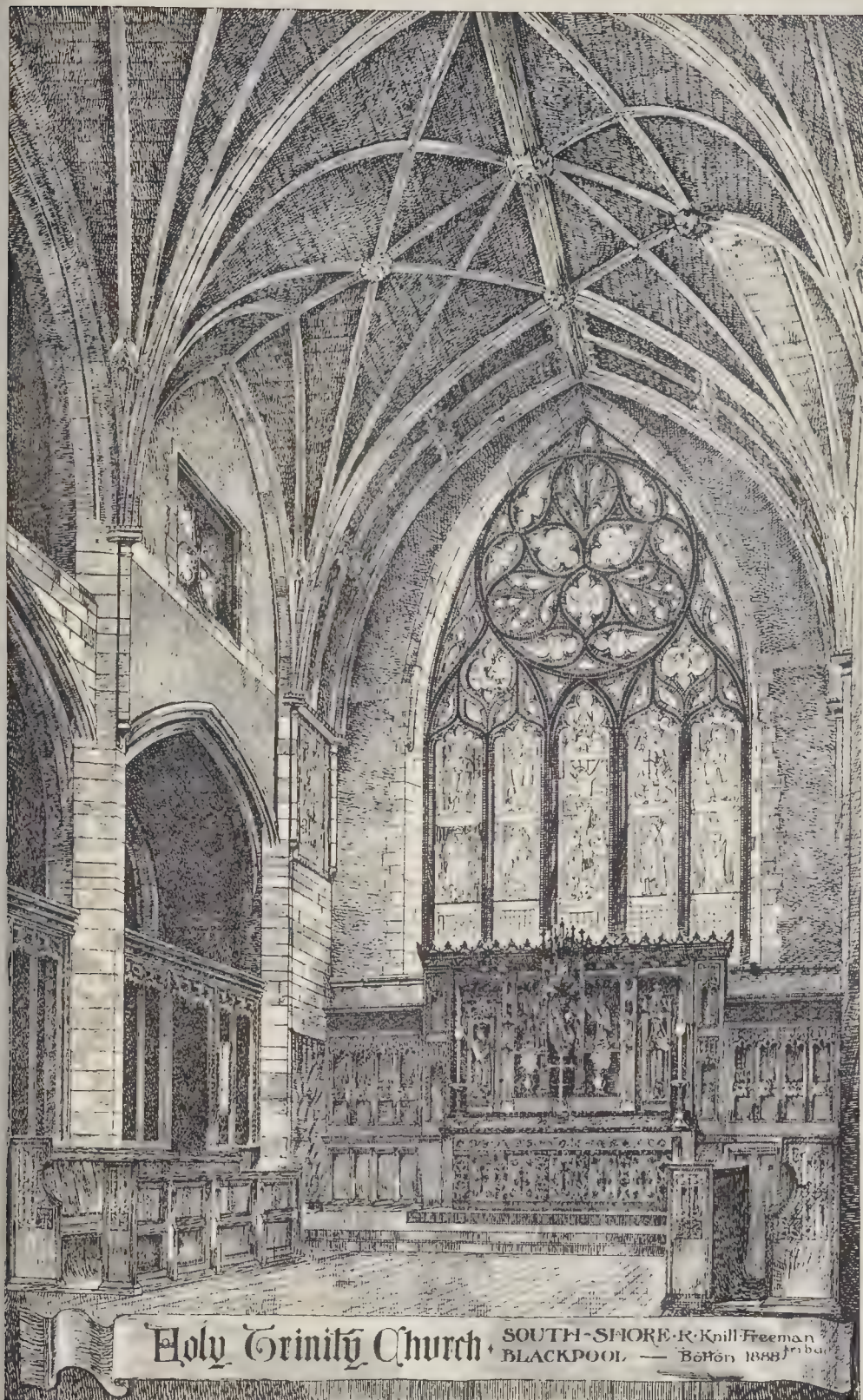


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NEW PUBLIC BATHS, HAMPSTEAD.—MESSRS. SPALDING AND AULD, ARCHITECTS.



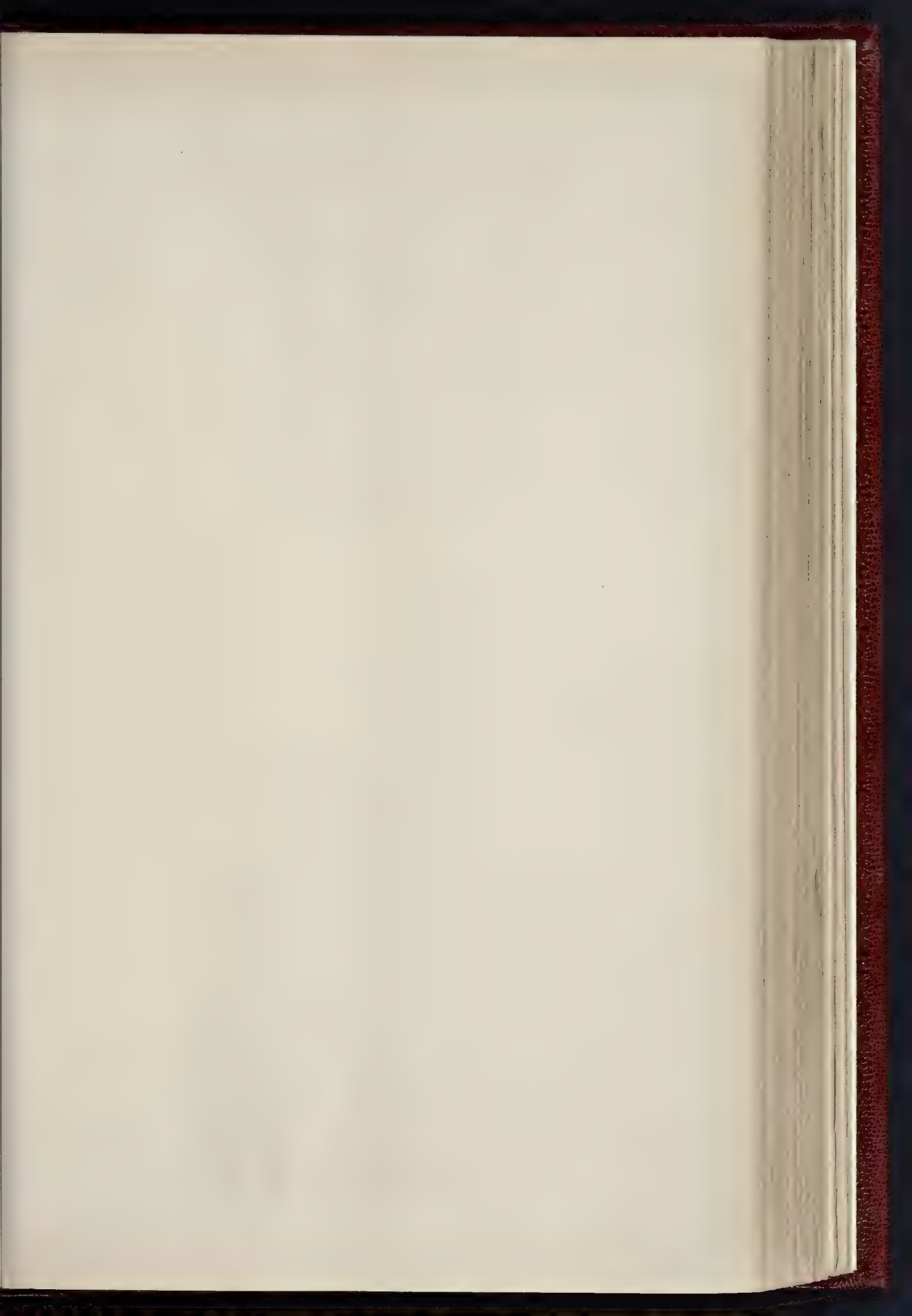




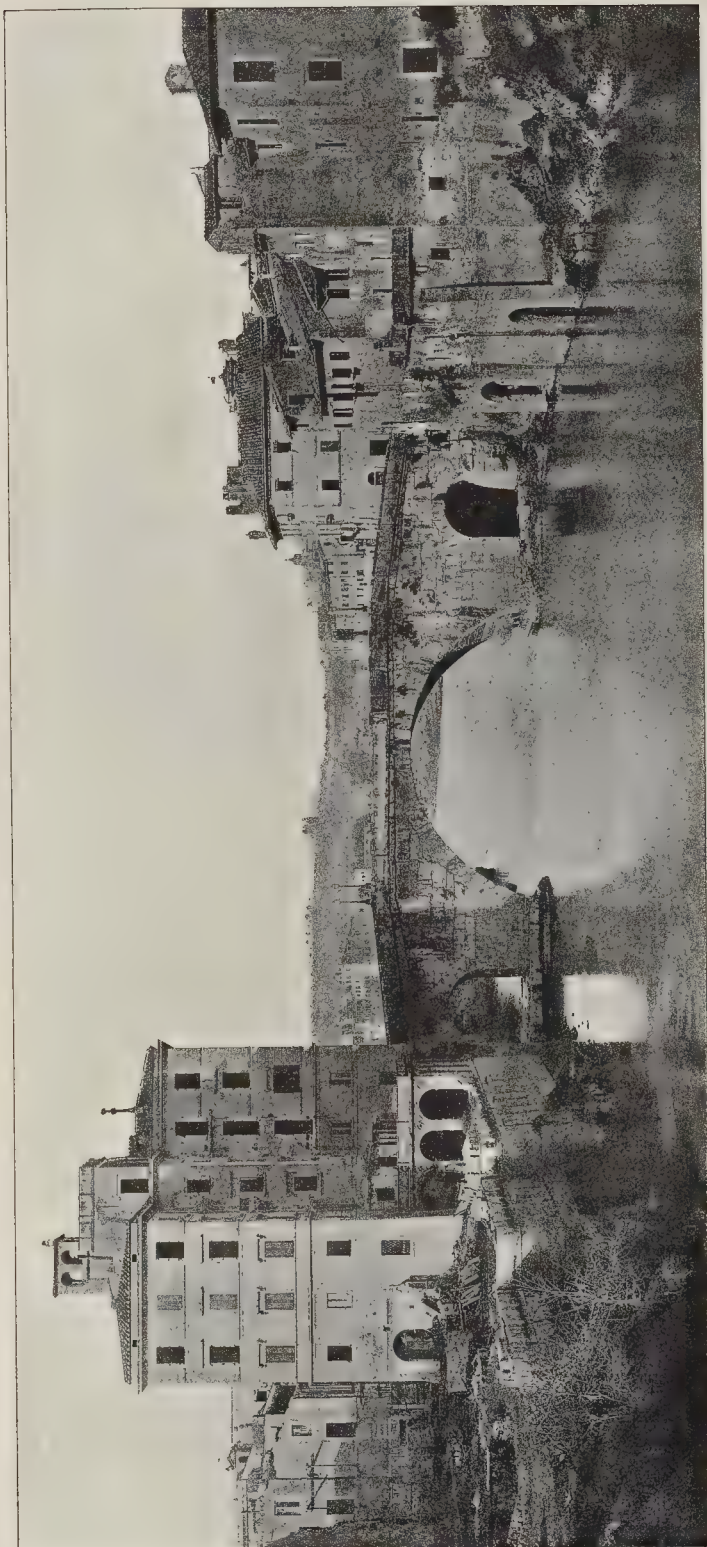
Holy Trinity Church, SOUTH-SHORE R. Knill Freeman  
BLACKPOOL — Bohn 1888







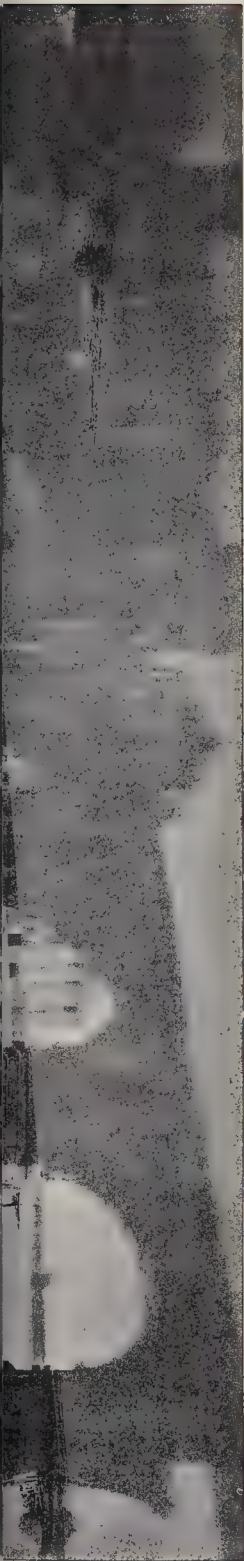
THE BUILDER, APRIL 6, 1889.



PONTE CESTIO OR PONS GRATIANI.







PONS AEMIUS OR PALATINUS.



PONTE GARIBOLDI.

ANCIENT AND MODERN BRIDGES OVER THE TIBER AT ROME.





to another; and, by making the roof fire-proof in addition, to prevent fire from spreading from one compartment to another through the roof burning away.

To gain strength, and in so doing to avoid as far as possible lateral thrust on the walls, and, by making the floor in one homogeneous mass, to distribute the weight equally over them.

To render the floors sound-proof as well as fire-proof.

And to secure the building from the attacks and effects of both dry-rot and damp.

The systems now most in use in English practice appear to be:—

- (1.) The concrete arch floor.
- (2.) The flat, or suspended, concrete floor.
- (3.) The arch block, or American floor.
- (4.) The flat brick, or French floor.
- (5.) The solid wooden floor.

The following systems are described in detail as examples of the different types of construction:—

Messrs. Dennett's, and Wilkinson's, representing the concrete arch floor; Messrs. Dawney's, Lindsay's, and Gardner's, representing the flat concrete floor. Messrs. Doulton's (the Doulton-Peto), representing the arch-block, or American floors. Messrs. Homan & Rodgers's, representing the flat brick, or French floor; and Messrs. Evans & Swain's, representing the solid wooden floor.

Taking them in the order given, the inventors of the "Dennett's fire-proof construction" rely for the resistance to fire offered by their system on the properties of sulphate of lime (gypsum). Ordinary limestone cements, when exposed to the action of fire, lose their cohesive power, and tend to fly, thus resembling the original carbonate; but experiments have proved that sulphate of lime loses little of its cohesion by calcination, and that it will remain intact even when exposed to a white heat, and to the application of cold water while in that state, though it is necessarily considerably weakened; in fact, it may be said to resemble timber under the action of fire. The outside, becoming charred, serves as a protection to the inside.

The system consists of concrete arches supported by walls for narrow spans, and by rolled joists for wider spans. The concrete is composed of broken brick and sulphate of lime. The arches are given a minimum rise of 1 in. to every foot of width up to spans of 10 ft. The concrete can either be filled in solid over the haunches, to form a floor of the same material throughout, or arranged to carry a wooden floor, as the building requires. Where columns and main girders are required, both are completely encased in the concrete, while the ceilings can either be plastered, or ceiling joists can be placed on the lower flanges of the joists and lathed and plastered.

From the slight rise given to the arches, the thrust on the outer walls is reduced to a minimum.

This floor can be laid as a flat floor, if required, but the usual construction is that of the arch.

The concrete of which these floors are composed is a non-conductor of both sound and heat. As an instance of its great strength, on one occasion, when a building was being erected, a scaffold-pole fell vertically from a great height on to an arch of this concrete and knocked a hole through it exactly the size of the pole. The minutest examination failed to discover anything approaching a fracture or crack either in the concrete immediately surrounding the hole or at any other point in the arch.

The long list of buildings in which the Dennett construction has been adopted shows the high opinion in which it is held. Mention may be made of the Home, Colonial, and Foreign Offices, the National Gallery, St. Thomas's Hospital, the Law Courts in London and Birmingham, and the Imperial Institute.

The cost of this floor, for a 12 ft. bearing and 10 ft. span of arch, inclusive of joists, is 9s. 3d. per square yard; the weight, 54 lbs. per square foot; and the safe load, 2 cwt. per square foot.

Messrs. W. B. Wilkinson & Co. have two systems for fire-proof floors,—one of concrete arches, similar to the Dennett construction; and the other a protection to wooden flooring, consisting of fibrous plaster slabs laid as pugging between joists, and thinner ceiling-slabs of the same material.

Referring to the first system: the concrete of which the arches are made is composed of bricks broken to 1½ in. gauge, coke breeze, and Portland cement. The form of arch is similar to the Dennett construction; main girders and

columns, when used, are covered with Wilkinson's fibrous plaster (described later).

The floors can be finished entirely in concrete, or arranged for wood, tile, or other paving.

For landings, corridors, and similar small spans, no joists are required, the concrete being laid on flat centering; additional strength is given by the insertion of tee irons, 2 ft. 6 in. apart, in the concrete.

Ceilings can either be finished off with plaster, or laid with ceiling joists, to which are nailed fibrous plaster ceiling-slabs, ½ in. thick.

This system has been used at Edinburgh University, at several stations on the North-Eastern Railway, by the War Department, and in many warehouses and stables.

The cost of this floor for a 12 ft. bearing and 10 ft. span of arch, inclusive of joists, is 7s. 6d. per square yard; the weight, 52 lbs. per square foot; and the safe load, 2 cwt. per square foot.

The second system is suitable for dwelling-houses, offices, &c., and has the additional advantage that it can be adapted to any existing wooden floor.

In construction it is similar to the pugging invented by Earl Stanhope, and described previously; slabs of fibrous plaster pugging are nailed to wooden angle-fillets on the joists, and a triangular plaster fillet is then run along the slab against the joist. The floor is boarded over in the usual way, while the ceiling consists of fibrous plaster ceiling-slabs nailed to the joists; all joints are carefully plastered, and a series of air-tight compartments is thus produced. The slabs for both pugging and ceiling are made of coke breeze and plaster on a basis of cocoa-nut fibre; they are non-inflammable, and by reason of their lightness are specially adapted for wooden floors, as the walls can be of the usual thickness, while concrete floors must be supported by much stronger walls.

The cost of pugging and ceiling is about 5s. per square yard, exclusive of timber construction.

Mr. A. D. Dawney is one of the pioneers of the flat or suspended concrete floor. His system consists either of ½-in. square iron bars 12 in. apart, or of small 3-in. joists 16 in. apart, resting on the lower flanges of 6-in. binding joists in 7-ft. bays. This construction is suitable for spans up to 20 ft. wide, the binding joists being strengthened according to the increase of span.

Flat centering is placed below the joists and concrete is filled in, forming one solid mass completely encasing the ironwork. The concrete is composed entirely of broken brick,—crushed fire-brick preferred,—and Portland cement. The joists are protected with a minimum depth of 1½ in. of concrete.

Any floor can be laid on the concrete, while the ceiling can either be floated or plastered.

The chief advantage lies in the fact that this floor is composed of a solid block of one material throughout, absolutely indestructible, of great strength, and of the simplest type of construction.

Mr. Dawney's system has been used in over 3,000 buildings, amongst others Charing Cross Hotel, the Colonial Institute, Exeter Hall, the Gaiety Theatre and Restaurant, London and County Bank (head office and branches), several Board Schools, Salvage Corps and Fire Brigade stations.

The cost of this floor, for a 12-ft. bearing, including joists, is 7s. per square yard, the weight 40 lbs. per square foot, and the safe load 2 cwt. per square foot.

Messrs. W. H. Lindsay & Co., of Paddington, also use the flat construction. The joists are spaced from 18 in. to 36 in. apart, additional strength being given to both concrete and joists by means of trussed rods. These are placed in pairs on the joists about 18 in. apart, and pass over and under them, thus having the effect of bracing on the joists. The ends of the rods are bent over to form a clip on the flange of the joist.

One great advantage claimed for these rods by the inventor, is that if any portions of the concrete give way under fire, the rods keep the whole slab from falling, and the damaged parts can afterwards be cut away and made good.

The concrete used is Lindsay's patent pumice concrete, consisting of coke breeze, mineral sand, and Portland cement; it weighs 80 lbs. per foot cube as against 112 lbs. for ballast concrete and 100 lbs. for brick concrete, and materially lightens the weight of the whole floor. The floor and ceiling can be finished in

any of the usual methods. The cost of this floor for a 12-ft. bearing, including joists, is 7s. per square yard, the weight 44 lbs. per square foot, and the safe load 2 cwt. per square foot.

Messrs. Lindsay & Co. have another system of fire-proof flooring for use where greater strength is required. The patentees' steel floor troughs are used and filled with pumice concrete, the underside being protected either by a lath and plaster ceiling secured to fillets bolted to the troughs, or by pumice concrete slabs suspended in the same way.

This flooring is considerably more expensive, and a great disadvantage lies in the fact that the whole surface, though sheathed, is practically a sheet of metal, and therefore would be sooner affected by fire than the other system.

These floors have been used in the National Liberal Club, the Prudential Assurance Company's offices, Holborn, in several blocks of artisans' dwellings, warehouses, offices, and mansions.

Messrs. Gardner, Anderson, & Clarke's system is practically Lindsay's floor with the trussed rods omitted, the concrete used consisting entirely of coke breeze and Portland cement. The joists are spaced out, flat centering is slung to them, and concrete filled in to a depth of 1 in. below the joist and 1 in. above the top flange. The joists are thus completely embedded in a non-conducting material. This floor, owing to its light construction, has been largely used for shops with dwellings above them.

The cost of this floor, for a 12 ft. bearing, including joists, is 7s. per square yard, the weight 46 lbs. per square foot, and the safe load 2 cwt. per square foot.

The Doulton-Peto floor is of arch construction, but the arch is perfectly flat, consisting of a series of terra-cotta blocks completely encasing the joists or girders. It is composed of springers or skewbacks resting on and overlapping the lower flange, and of a wedge-shaped key block, the intervening blocks being rhomboids.

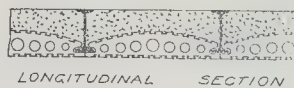
The blocks are composed of a mixture of clay and terra-cotta, and are moulded with dovetail grooves on the lower surface to afford a key for plaster. The material of which the blocks are made does not crack either under heat, or from the effects of cold water during heat, while the joist or girder is completely covered with the same material, which is a great non-conductor of heat, and on this account has been used for Turkish baths.

It must, however, be borne in mind that there is a considerable amount of thrust, involving the use of stronger walls, while a layer of concrete or dry filling has to be added to complete it, and, from the nature of the construction, the spans cannot exceed 6 ft. without increasing the depth.

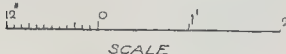
It has been used at Whiteley's, the London Pavilion, the National Provincial Bank, head office, and in several warehouses.

The cost of a 6 ft. floor for a 12 ft. bearing and 6 ft. span of arch, inclusive of joists, is 9s. per square yard, the weight 84 lbs. per square foot, and the safe load 2 cwt. per square foot.

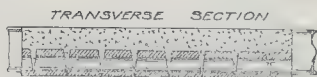
The Homan & Rodgers floor is an application of the French, or flat brick floor; the arch construction is avoided, and the flooring, being a dead weight, serves to tie and strengthen the walls. The system consists of rolled joists,



LONGITUDINAL SECTION



SCALE



TRANSVERSE SECTION

Messrs. Homan & Rodgers' Improved Fire-proof Floor.

placed 3 ft. 6 in. apart. Resting on the lower flanges of the joists, tee iron bearers are laid 12 in. apart, the ends being bent up so that the undersides of the joists and tee-irons are on the same level. Specially-moulded hard-burnt bricks are then laid on the tee-irons. These bricks are



of gault clay, and are perforated for lightness; they are 12 in. long, 4½ in. wide, tapering to 3 in., and 2½ in. deep, and are made with wedge-joints longitudinally and dovetail-joints transversely, as shown in the diagram; they are moulded with longitudinal dovetail grooves on both surfaces to afford a grip for the concrete and a key for the plaster. A depth of 2½ in. of coke-breeze concrete is laid over the bricks; this fills up the wedge-joints and binds the whole into a solid mass.

The soffit is then plastered, the grooves on the bricks forming a sufficient key to carry the plaster under the joists and tee-iron bearers, thus covering all exposed surfaces of the iron-work.

The floor can be finished as required. The bricks are not affected by heat, and are protected from the effects of water by the concrete above and the plaster below.

The floor is practically noiseless, the different densities of the brick, concrete, and plaster intercepting the sound vibrations.

An additional advantage is in the diminished depth of the floor, owing to the absence of the arch.

These floors have been used by the London School Board, and in the General Post Office, the People's Palace, and several large blocks of mansions and warehouses.

The cost of this floor, for a 12 ft. bearing, including joists, is 7s. per square yard, the weight 35 lbs. per square foot, and the safe load 2 cwt. per square foot.

Since this paper was written, Messrs. Homan & Rodgers have produced an improved modification of their system, in which the tee-iron and flat bricks are superseded by hog-backed bricks 18 in. long, reaching from joist to joist, and clipping the lower flanges. These bricks are of the same transverse section as those used in the first system, but are hog-backed longitudinally, with rounded ends recessed to receive the joists, and perforated transversely for lightness. Both surfaces have similar dovetailed grooves. The floor is finished with breeze concrete up to the level of the joists.

This system is certainly an advance on that last described, as the tee-irons are dispensed with entirely, and the joists, though closer together, are protected by the jaws of the bricks.

The cost of this floor, for a 12 ft. bearing, is 6s. 6d. per square yard, and the weight 32 lbs. per square foot.

Messrs. Evans & Swain's fireproof construction depends on the known resistance offered to fire by solid timber. It is a well-known fact that, where flames are not able to play round timber or attack it at the ends, it will offer a very great resistance to the action of fire, and that, after it becomes charred to a certain depth, the charcoal formed on its surface becomes its protection, charcoal being a non-conductor of heat.

It is also a well-known fact that common plaster offers great resistance to fire, and upon the application of these two facts depends the success of this system, for which the inventors claim strength, simplicity of construction, and almost perfect resistance to fire. An additional claim also deserves recognition, namely, that floors constructed on this system, being homogeneous throughout, the whole weight is a dead weight, and consequently there is no thrust on the walls.

The flooring consists of solid wooden joists of uniform depth and thickness, closely laid, without any intervening space whatever, and spiked together; the spikes should be driven about 18 in. apart, and placed as in chain rivetting. It is preferable to bore holes for the spikes to prevent splitting.

The depth of the joists varies from 4½ in. in spans of 8 ft. to 11 in. in spans of 30 ft. The ends of the joists bear on the walls in the usual way, only no plates are required.

All cracks or shrinkages on the upper surface are filled up with a grouting of liquid plaster, while the ceiling can be formed either by nailing the laths direct to the joists or to fillets on the joists, or the lathing can be dispensed with by grooving the undersides of the joists to form a series of dovetails, which afford a key, and the ceiling can then be plastered.

As an additional protection the joists can be tongued, but this, of course, adds to the expense.

The upper surface of the floor can either be left rough, boarded, or floated and finished as a tile or concrete floor, but a layer of hair felt on which floor-boards are laid serves not

only to deaden sound but also increases resistance to fire.

An excellent feature of this flooring is that it dispenses entirely with the use of iron, the action of which under fire is well known.

Owing to its great strength it has been largely used for dock and railway warehouses, amongst others the recently-completed warehouses in Commercial-road, E., for the London, Tilbury, & Southend Railway Company, and for warehouses at the East and West India Docks, while it is now being used in the additions to Westminster Hall.

The cost of a 5½ in. floor, for a 12 ft. bearing, is 10s. 6d. per square yard, the weight 20 lbs. per square foot, and the safe load 7 cwt. per square foot.

A table giving approximately the relative cost, weight, and safe load of a floor 12 ft. span, in the different systems, is appended.

TABLE, GIVING APPROXIMATELY THE RELATIVE COST, WEIGHT, AND SAFE LOAD OF A FLOOR, 12 FEET BEARING, IN THE DIFFERENT SYSTEMS DESCRIBED IN DETAIL.

| Arch Construction. | Cost per Square Yard. |                      | Weight per Square Foot. |                      | Safe Load per Square Ft. | Length of Arch. | Span.    |
|--------------------|-----------------------|----------------------|-------------------------|----------------------|--------------------------|-----------------|----------|
|                    | Exclusive of Joists.  | Inclusive of Joists. | Exclusive of Joists.    | Inclusive of Joists. |                          |                 |          |
|                    | s. d.                 | s. d.                | lbs.                    | lbs.                 | cwt.                     | ft.             | ft.      |
| Dennett ...        | 6 9                   | 9 3                  | 50                      | 54                   | 2                        | 12              | 10       |
| Doulton ...        | 6 6                   | 9 0                  | 30                      | 34                   | 2                        | 12              | 6        |
| Wilkinson ...      | 6 0                   | 7 6                  | 50                      | 52                   | 2                        | 12              | 10       |
| Flat Construction. |                       |                      |                         |                      |                          | Bearing.        |          |
| Dawney ...         |                       | 7 0                  |                         | 40                   | 2                        | 12              | Immature |
| Gardner ...        |                       | 7 0                  |                         | 46                   | 2                        | 12              | "        |
| Homan & Rodgers.   |                       | 7 0                  |                         | 35                   | 2                        | 12              | "        |
| Lindsay ...        |                       | 7 0                  |                         | 44                   | 2                        | 12              | "        |
| Evans & Swain      | 10s. 6d.              |                      | 20 lbs.                 |                      | 7                        | 12              | "        |

To make this paper more complete, reference must be made briefly to other systems which have been introduced from time to time, and have met with varying success.

The "Fox and Barrett" floor, alluded to previously, consisted of rolled joists placed about 20 in. apart. On the bottom flanges, strips of wood 1½ in. square were laid about ½ in. apart; concrete was then filled in between the joists and the ceiling plastered, a key being afforded by the undersides of the fillets.

Messrs. Measures introduced and patented a modification of this floor, in which the joists were placed from 3 ft. to 4 ft. apart, and tee-iron bearers 9 in. apart were substituted for the wooden fillets. The floor was then concreted on flat centreing and the ceiling plastered. This system was used extensively in London and elsewhere from fifteen to twenty years ago.

Hornblower's floor consisted of a series of fire-clay tubes resting in arch construction on larger tubes of the same material, filled with fine concrete, and strengthened with tension-rods secured to the walls.

Mr. Mark Fawcett has recently introduced a modification of the "Hornblower" floor, in which rolled joists are placed 2 ft. apart. Resting on the bottom flanges, and encasing them, semi-circular tubes of fire-clay, 4½ in. diameter and 1 in. thick, called by the inventor "tubular lintels," are laid diagonally. The flat, or lower, surface has a projecting lip or flange, forming a wedge-joint with the flange of the next tube. The whole is concreted over with breeze concrete, and the ceiling plastered, the flat side being grooved in the same way as the bricks used by Messrs. Homan & Rodgers. (The cost, including joists, for a floor 12 ft. bearing, is 8s. 6d. per square yard, and the weight 40 lbs. per square foot.)

Allen's system consisted of a network of iron bars forming meshes 2 ft. square, covered with concrete. Iron bars 3 in. by 1 in., placed 2 ft. apart, were built into the walls; on these and wired to them, were laid ½ in. iron rods also 2 ft. apart. Flat centering was placed under this and concrete to a depth of 4 in. was laid on. The concrete was composed of four parts of crushed slag or clinker to one part of Portland cement.

Clark Bunnett's floor is of the flat floor and joist type, but wooden fillets are laid across the top flanges of the joists and clipped to them. Concrete is spread on flat centering and brought level with the top of the fillets; a layer of mastic is then run over the whole surface, which is finished off with wood blocks, or floor-boards nailed to the fillets through the mastic. The ceiling is plastered in the usual way.

Moreland's system, and that recommended by the late Sir William Fairbairn, may be taken together; as, in both cases, girders were used with arched iron plates carrying the concrete, the construction being that of a concrete arch with an iron lining to the soffit, and both, of course, were open to this great objection that a large surface of iron was directly exposed to the attacks of fire.

French systems. One of the earlier French floors was that known as "Thusne's." It consisted of rolled joists placed 3 ft. apart. Resting on the lower flanges were laid flat iron bars or interties, the ends being secured by pins to straps passing over the joists. Iron bars ½ in. square, called "fauteurs," were laid 9 in. apart transversely on the interties and were wired to them; flat centering was placed under the joists, and a 3 in. layer of coarse plaster of Paris was poured over the whole surface.

A boarded floor was then laid on the girders.

Several modifications and improvements of this system have been made from time to time by French architects, and among them is one much in vogue now in Paris, in which the joists and interties are retained, the latter being placed 9 in. apart. Bricks on edge are laid on the interties and are then plastered on both sides. The Homan and Rodgers floor is at application of this system.

M. Zorès exhibited a floor in the Paris Exhibition of 1887\* on the arch and girder system, which has been much used in France. The girder consisted of wrought iron rolled in the form of an inverted flanged trough. These girders were placed 2 ft. 8 in. apart, and the arch was composed either of perforated bricks, or of hollow plaster blocks, in either case concreted above and plastered below. The American system has also been adopted in a modified form in Paris, moulded perforated bricks taking the place of the terra-cotta blocks.

American systems. From papers on the subject read before the Royal Institute of British Architects by Mr. Gale in 1882 and Mr. Gass in 1886, the general system in America appears to consist of rolled joists, and hollow arch-blocks of a hard-burnt clay resembling terra-cotta or fire-clay, the joists being protected by skewback blocks with projecting lower members.

Another system consists of rolled joists and segmental hard-brick arches; the bricks used are 8 in. by 4 in. by 2½ in., and are of unusual hardness. The joists are protected by terra-cotta tiles fixed to the flanges by mortar.

In both these systems a thin layer of cinder concrete is spread over the arch, and the floor is laid on this. The system of arch-blocks and joists has been patented in England by Messrs. Doulton.

Pugging is also very largely used in America for fire-proofing wooden floors. It consists of bricks laid flat on fillets between wood joists and covered with a thin layer of cinder concrete. The joists are boarded over the top, and the ceiling is formed with either terra-cotta or cement tiles, clipped to the joists by iron plates and well plastered at the joints.

Mention may be made of the so-called fire-proof plasters and paints, which doubtless tend to retard the action of fire, owing to their being made of fire-resisting substances.

Robinson's plaster and the Hitchens Company's plaster are mainly composed of gypsum, and rely on its resistance to fire as opposed to

\* See Rivington, part II., p. 377; date given 1887.



ordinary lime plasters; in the Hitchens master slag wool is used in addition.

The Cyanite Company have produced a paint the principal ingredient of which is silica, a material which has long been known for its great powers of resistance to fire. This paint, no doubt, a great protection to exposed timber.

Asbestos is another material which can be used either in the form of plaster or paint, but its properties are more of a non-conducting nature than fire-resisting.

Slag wool and slag cement, now both in their infancy, are also coming into use in fire-resisting construction. There is little doubt that slag cement, which is rapidly supplanting Portland cement in Germany, will shortly be largely used for concrete floors in this country. It is both cheaper and lighter than Portland cement, and when mixed with sand is considerably stronger, while its fire-resisting properties exceed those of both gypsum and Portland cement.

Taking the relative merits and defects of the different floors into consideration, it will perhaps be better to deal with the individual floors first, and then to contrast the types of construction.

Comparing the arched systems, in both the Dennett and Wilkinson floors, brick forms the basis of the concrete, one depending on gypsum and the other on Portland cement. Of the two, gypsum gives more resistance to fire, and is lighter; but, its cohesive power being less, the concrete has to be made in stronger proportion, hence the increased cost.

In both systems the weak point appears to be the want of protection to the joist, which is dependent on a plaster covering. The Doulton floor overcomes this feature in a way as effectual as any, and this is a very strong point in its favour. Its disadvantages are that it requires a layer of concrete or dry filling over the top to make it air and water tight, thus forming two layers of different materials, one of which is more affected by heat than the other; that it cannot be used in such wide spans as either of the others without increasing the depth, and, consequently, the cost; and that there is a considerable amount of thrust. The lightness is much in its favour, but the extra concrete or filling, and the greater number of joists required, must be borne in mind when comparing it with the others. Of the three, the Dennett floor has undoubtedly popular opinion in its favour; but apparently a good fire-resisting floor of arch construction could be made by a combination of the Dennett and Doulton floors, the joists being protected by the Doulton terra-cotta blocks covering the flanges, and acting as springers to an arch of Dennett concrete.

The three flat floors again differ mainly in concrete. The use of trussed rods in Lindsay's system doubtless strengthens both joists and concrete, but at the expense of an increase of metal, thereby giving an additional chance to fire. The nature of the flat construction is a series of suspended landings or slabs, supported by joists and completely encasing them, thus forming a homogeneous mass which acts as a dead weight on the walls or supports, dispensing entirely with thrust, and serving to tie in the walls.

The three are identical in cost and safe load, the difference in weight being in favour of Dawnya's, and for resistance to fire, preference must also be given to Dawnya's, the concrete of which is composed entirely of broken brick and Portland cement, the former giving more resistance than coke breeze, on which both Lindsay's and Gardner's depend.

The Homan & Rodgers floor is of the flat construction, bricks supported by iron bearers taking the place of the solid concrete slab. This floor is considerably lighter than any one of the other three, and not much more expensive; but the additional metal of the tee-irons is certainly against it, as, although protected by plaster, directly the iron goes the bricks follow, while the tee-irons would also give a vibratory effect to the floor when used for moving loads. Another defect is that, when constructed, this floor is in layers of materials differently affected by heat.

Its lightness and shallowness are, however, both in its favour.

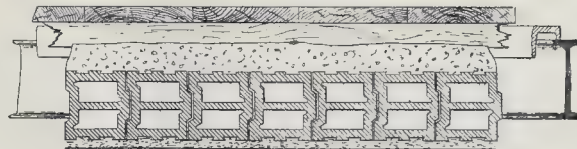
Coming lastly to Evans & Swain's floor, the chief disadvantage is the cost; but for strength and lightness it is inferior to none. It can be used in as wide spans as any of the others without intermediate supports, is more homogeneous, and requires less strength in the walls

than the concrete and iron floors. A grave disadvantage is the liability to dry-rot, as the floor, being a solid mass of timber, if dry-rot once obtained a hold it would be next to impossible to prevent it from spreading without frequently removing the floor and ceiling for inspection, and thereby creating a kind of charge for maintenance which is not required in any of the other systems; but, as a fire-resisting medium, the density of this floor, coupled with the absence of iron, renders it as effective as any of the others.

Contrasting the arched and flat floors, it is obvious that the use of the flat floor involves more joists, as the concrete slabs, being virtually beams supported at both ends, cannot be used in such wide spans as the arch, the joists in the latter being from 7 ft. to 10 ft. apart, while in the former the average is from 18 in. to 3 ft., thus involving the use of more iron; but, on the other hand, the concrete casing of the flat floor is a better protection than the plaster covering of the joists in the arched floor.

The action of the arches pressing against each other no doubt tends to brace and strengthen the joists laterally; but against this is the thrust on the outer walls and the increased weight of the joists, which have to carry a much greater load than in the flat floors, and consequently add to the weight on the walls or supports. The head-room required for the arch is also a serious consideration when opposed to the shallow depth of the flat floors.

In the matters of cost and weight, the advantage certainly lies with the flat floors; while for safe load, with the exception of Evans & Swain's, which is lighter and stronger than any, there is nothing to choose between either arched or flat construction, the strength depending on the joists used.



Mr. W. Lindsay's Fire-proof Floor.

In summing up between the different floors, there appear to be two leading features for consideration:—

Firstly, Which system gives most protection to the iron work supporting the floor?

Secondly, Which of the different materials employed gives most resistance to fire?

Looking at the first question, Evans & Swain's floor, requiring no ironwork, stands by itself; but next to it, and certainly in advance of all the others, on this one point, must be placed Doulton's floor, the hard-burnt blocks, with their overlapping bases, forming a most efficient protection to the joist. There is little to choose between the different concrete floors on this point, as in the case of the arched floors there are comparatively few joists dependent on a plaster covering, while in the case of the flat floors, there are from four to six times the number of joists, which are, however, completely embedded in concrete. The Homan & Rodgers' floor has more ironwork than any of the others, both joists and tee-irons depending entirely on a plaster ceiling.

On the second question, taking the cements first, gypsum gives more resistance to fire than Portland cement, but at the expense of strength. The other materials to be considered are coke breeze, solid wood, and clay in the three forms of terra-cotta blocks, broken brick, and brickwork as in the Homan & Rodgers' floor. In any of these three forms, clay is certainly better than coke breeze, as the latter, under the influence of intense heat such as that in the

midst of a building on fire (stated by Captain Shaw to be from 2,000 deg. to 3,000 deg. Fah.) will gradually calcine and burn away, while the tendency of clay is to become harder. Another disadvantage of coke breeze used as concrete is its porosity.

The impervious mass of the wooden floor, well protected by plaster, should render it as capable of resisting fire as either of the other materials, though it would no doubt share the fate of coke breeze under a fire of similar intensity; but there being no ironwork in it to give way, it is entitled to the preference over coke breeze, and though, by its nature, more inflammable than either terra-cotta or brick-concrete floors, on the same ground (namely, the absence of iron) it would probably give as much resistance as either of the last-mentioned floors.

Mr. William Lindsay, jun., has recently designed and patented a fireproof floor, which, although it has not yet been used, apparently fulfils the two requirements laid down by the author, and, therefore, deserves recognition in this paper, while the cost and weight compare favourably with the systems already described.

The floor is of the flat brick type, and consists of steel joists, placed 2 ft. apart, with rectangular hollow bricks suspended to them by means of a jaw or recess at each end. The bricks are 2 ft. long, 4 in. wide, and  $\frac{1}{2}$  in. deep, with a central horizontal web running from end to end, the thickness of the sides and web being  $\frac{1}{2}$  in. The bricks are moulded with longitudinal dovetailed grooves on both surfaces to afford the necessary key for plaster and concrete, while a bond is obtained by means of a wedge-shaped boss or projection running the full length of the brick, fitting into a corresponding recess on the next brick and forming a joggle as shown in the accompanying diagram. The lower flange

of the joist is protected by a narrow tile resting on the jaw of the brick, while the upper flange is covered with a rectangular channel pipe made of the same clay as the bricks, and bedded in the concrete covering. The underside is then plastered, while the floor can be finished as required.

The clay of which the bricks are made is of even texture and unusual hardness when burnt; in fact, it closely resembles the hard-tile pottery of the Roman period. When tested recently, the mean breaking weight at centre on a bearing of 20 in. exceeded 15 cwt. per brick. This would give a safe distributed load of nearly 6 cwt. per square foot.

The objection, stated previously, to floors consisting of two layers of different materials is overcome in this case by using concrete composed of the same burnt clay as the bricks; thus, although in two layers, the materials of each are identical.

The cost of this floor is 6s. 9d. per square yard, and the weight 29½ lb. per square foot, including joists and concrete.

If it were possible to expose all the floors described, together with a brick arch, simultaneously to a fire burning for several hours at a temperature of 2,500 deg. Fahrenheit, the author is of opinion that the only floor which would be found "fire-proof" would be the brick arch, although the others are undoubtedly capable of giving great resistance to fire, retarding its action by confinement, and, in this way, giving greater chances of extinction.



The conclusion arrived at finally is that with the exception of the brick arch, there is no such thing as a "fire-proof" floor, and that it would be more correct to describe all these floors as "fire-resisting."

The following works have been consulted in compiling this paper—

"Proceedings of the Inst. C.E."  
"Proceedings of the R.I.B.A."  
"Livingston's Building Construction."  
Captain Shaw's "Fire Surveys."

The author desires to express his sincere thanks to the makers of the different floors for the kind way in which they have all assisted him with the fullest information and illustrations of their respective systems.

#### THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

The eleventh annual dinner in aid of the funds of this excellent charity was held on Tuesday evening last at the Holborn Restaurant, Mr. John Aird, M.P., in the chair, supported by Mr. E. Brooks (treasurer), Mr. J. Howard Colls, Mr. T. F. Rider, Mr. J. W. Hobbs (Mayor of Croydon), Mr. A. Ritchie, Mr. Thomas Stirling, Mr. S. Clarke, Mr. W. R. Freeman, Mr. Basil P. Ellis, Mr. A. W. T. Bean, Mr. L. Mierille, Mr. W. Down, Mr. T. Boyce, Mr. E. Allbright, Mr. T. Bishop, Mr. C. Brown, Mr. E. Brooks, Mr. B. C. Fox, Mr. W. D. Gilbert, Mr. E. Graystone, Mr. G. C. Harrison, Mr. E. W. Holland, Mr. G. C. Kentish, Mr. H. Mason, Mr. W. Miles, Mr. F. T. Mullett, Mr. H. W. Parker, Mr. E. Pitts, Mr. E. Potts, Mr. C. Powell, Mr. J. A. Robson, Captain E. C. Roe, Mr. W. Seymour, Mr. A. A. Stanger, Mr. A. Stansfield, Mr. C. K. Turpin, Mr. R. J. Ward, Mr. T. H. Winny, Mr. H. J. Wheatley (secretary), and others, to the number, in all, of 259.

The usual loyal and patriotic toasts having been duly honoured (Captain Roe responding for "The Army, Navy, and Auxiliary Forces"),

The Chairman rose in the midst of much applause to propose the toast of the evening, "The Builders' Clerks' Benevolent Institution." He said that the Institution consisted of a representative body of men who, while working hard day by day at their responsible calling (by following which they were benefiting the public as well as their employers), felt that they had a duty to fulfil towards their families and to the families of their fellow-clerks should they be unhappily placed in circumstances of distress by accident or illness carrying off the bread-winner of the family. The Institution had in the past granted much-needed relief to those builders' clerks who, from various circumstances beyond their control, had not been able to put money aside for the benefit of their wives and families, and also to help the relatives of those of their fellows who might be taken away by illness or accident before being able to make any such provision. Such were the worthy objects which, more than twenty years ago, had suggested the formation of the Institution, and a vast amount of good had it done (applause). It had been governed wisely and well from the beginning (hear, hear). Many homes in this great metropolis had been made happier, much grief had been assuaged, and a great deal of anxiety removed, by the timely help afforded by the Institution in the hour of trouble (applause). Such being the objects and work of the Institution, he felt it to be a great honour to be its President (cheers), and he was very thankful to the many eminent members of the building trade for their presence and support on that occasion (hear, hear). He felt assured that all master-builders, equally with himself, would acknowledge the great indebtedness they were under to their clerks (hear, hear), whose cordial co-operation and untiring assiduity were so cheerfully given (applause). It was the duty, as he was sure it was the pleasure, of the great builders of the country to support the Institution as one way of offering a tribute of respect to the men to whom they owed so much (hear, hear). The Institution was very carefully and economically conducted, and the expenses of management were almost infinitesimally small. Those who were disposed to help it by subscriptions or donations might therefore depend upon their gifts being applied to the very best advantage. He proposed "Success to the Builders' Clerks' Benevolent Institution."

The toast was very heartily received.

Mr. J. Howard Colls, in proposing "The Architects and Surveyors," said that he as a builder had great respect for the members of those professions, but it was his decided opinion that each man should stick to his own line of work. He had said before, and he would say again, that there was nothing worse than architects' quantities, except, perhaps, quantity-surveyors' architecture (laughter). With the toast he had much pleasure in coupling the name of Mr. Howard Clarke, son of Mr. T. Chatfield Clarke (applause).

Mr. Clarke, in replying, said that there had been much discussion of late in reference to the question

of quantities, and it had been suggested that some change or other was necessary to meet difficulties which had cropped up; but it was his decided opinion that if the quantity-surveyor did his work properly and carried it through on business lines, there was very little need for change or alteration (hear, hear). It was mostly because people would not always adhere to the proper lines of business in such matters that they found themselves involved in law-suits and arbitrations. He believed that any quantity-surveyor of standing would always take the responsibility for his work. In conclusion, Mr. Clarke spoke of the indebtedness of architects and surveyors to builders' clerks.

Mr. James Hill, in a humorous speech, proposed "The Builders," coupled with the name of Mr. W. R. Freeman (Mowlem & Co.), who briefly replied.

The other toasts were "The Past Presidents" (coupled with the name of Mr. J. W. Hobbs, Mayor of Croydon, who replied); "The President" (proposed by Mr. Thos. F. Rider); and "The Visitors" (proposed by Mr. G. C. Kentish, and coupled with the name of Mr. Basil P. Ellis).

During the evening, subscriptions and donations to the amount of 342*l.* were announced, including a donation of fifty guineas from the Chairman.

#### CASES UNDER THE METROPOLITAN BUILDING ACT: TIME FOR TAKING PROCEEDINGS AFTER GIVING NOTICE.

At Dalston Police-court, before Mr. Bros, magistrate, on March 25, the case of A. Payne, District Surveyor of East Hackney (South) and North Bow, v. George Mower, builder, came up for further hearing.

The defendant, it appears, had erected some stables and carriage-sheds formed by enclosing timber-stages in his yard. Notice that this was an irregularity had been served by the District Surveyor, giving the defendant twenty-eight days to amend, on August 29, 1888, and the work, not being done, a summons was issued on March 11. The chief point of the defence was that the summons was not issued in time, more than six months having elapsed since the notice of irregularity was served; but the District Surveyor contended that the notice of irregularity being taken out under the Act of 1878—the Metropolitan Management and Building Acts Amendment Act, 41 & 42 Vic., c. 32, Part II, Clause 17, which gives twenty-eight days for amending the work, the six months' limitation would date from the expiration of the twenty-eight days.

The magistrate adjourned the case to consider this point, and at the adjourned hearing, on March 25, 1889, Mr. Milner Jutsum, for the District Surveyor, referred to the case of Jacob v. Dodgson, 32 L.J. M.C., p. 113, in which it was held that the six months dated from the time the remedy could be enforced; to Meyer v. Harding, 17 *Law Times* reports, 140, a case of a continuing offence like the present one, in which it was held that the six months only applied to by-gone offences, for which penalty once for all is awarded; to Metropolitan Board of Works v. Anthony, 49 J.P. 229, in which the same judgment was given with regard to a continuing offence; and to Bovill v. Gibbs, J.P. 51, p. 485, in which it was held that the six months' limitation dated from the refusal of the builder to do the work.

After some argument, Mr. Romaine, on behalf of the defendant, admitted the summons was in time, but maintained that no alteration had been made in the premises for the last three years, during which time there had been a former summons with regard to the same premises which had been withdrawn, the District Surveyor alleging that on the former occasion the work required was done.

After hearing the evidence, the Magistrate decided for the District Surveyor and imposed a fine of 20*s.*, and 20*s.* costs, intimating that if the enclosures complained of were not removed, the defendant would be liable to fresh penalties.

#### EXTERNAL STAIRCASE TO A PUBLIC BUILDING.

A second case against the same defendant was then heard, for constructing the balustrade of the external staircase to a public building, namely schools belonging to St. John Baptist Roman Catholic Church, Mars-street, which the District Surveyor maintained was dangerous as affecting the only egress for the children in case of fire, and if the said balustrade were to give way the children would fall from a considerable height and a serious accident might ensue. The only defence here was that in some informal conversation with a workman the surveyor had passed the staircase as it was. After hearing the evidence the Magistrate made an order for the wooden balustrade to be removed and replaced by an iron railing in accordance with the letters and requisition of the District Surveyor, and gave costs 20*s.*

A large clock has just been erected at Sandiacre, near Nottingham, by John Smith & Sons, Midland Clock Works, Derby. It strikes the hours, chimes the quarters, and has two illuminated dials.

#### THE HALF-BRICK REVEAL.

SIR.—In the report of the last Institute discussion, one speaker at least is stated to have said that he "never could understand why a 4½-in. reveal was beneficial in the prevention of fire." I should be glad to be permitted to say in your columns what I should have said at the time, had I been able to be present, in answer to that remark.

I have stood by on a windy night and watched a burning house as it was gradually destroyed. Long tongues of flame issued from time to time from its windows, and were blown sharply along the face of the wall; and I noticed that at times they were blown past the next window openings, and did not curl round into them, but blew straight across, so that the window frames and sashes of the next house, though scorched, were not set fire to; and I saw that, had they been flush with the brickwork, they must have been kindled into a flame. In this instance I was an eye-witness to the efficiency of the 4½-in. reveal (and at a later period, when the roof caught, of the parapet), in protecting the next door house from destruction. It was in the suburbs, and no engine came for a long time, consequently one could see the action of these precautionary measures not complicated with any other protecting or retarding agency.

I have no doubt that some such observations, or that familiarity with the results of fires under similar circumstances, dictated the introduction of the 4½-in. reveal, and I am sure that any of your readers who have had the same experience will agree with me that this simple precaution is of substantial value. T. ROGER SMITH.

#### THE ARCHITECT OF THE MANSION HOUSE.

SIR,—I shall be much obliged if you will allow me to correct a blunder in my recent letter on the "Mansion House." There were two architects of the name of George Dance, father and son. The father designed the Mansion House, the son designed Newgate, St. Luke's Asylum, and the front of the Guildhall. I was careless enough to have found the two, and attribute the works of the younger to the older Dance. It is no excuse to plead that the same blunder has been made by Mr. Ferguson, in his "History of Architecture." It was an unpardonable piece of negligence on my part for which I am bound to apologise. Lincoln, April 2, 1889. EDMUND VENABLE.

"Marble Mosaic Tiles."—Some tiled floors produced under this title, and of which we have seen specimens at the "Builders' Supply Stores," are composed of random tesserae of marble embedded in fine cement and under great pressure, made in pieces or tiles 8 in. square, on which designs can be formed in different-coloured marbles, and the whole laid in a similar manner to a tiled floor. The advantage claimed over other somewhat similar materials is that the colouring is wholly in the marble, not in the cement, and that the material is exceedingly hard and durable; as it appears to be. The patentees are mistaken, however, in supposing that it can in an artistic sense compete in the least with true mosaic. It entirely wants, of course, both the freedom of design and the peculiarly architectural character of built-up mosaic. It may be an advantageous material in combining durability with a satisfactory appearance, when the expense of true mosaic cannot be afforded.

A New Canal in Sweden.—A new canal of great commercial importance is contemplated in Sweden, viz., from the Lake Vettern, in the heart of Sweden, to Udevalla, on the North Sea. The depth is to be 21 ft., and the canal would enable steamers of 3,000 tons burden to reach the interior of the country. There are to be three locks, 350 ft. in length, and 45 ft. in width. The canal would only be some twenty miles in length, but it would be of immense importance to the wood and iron industries of Sweden.

Registration of Plumbers.—The Mayor of Preston has made arrangements to hold a meeting in the Town Hall to receive a deputation from the Liverpool and Cheshire District Council, consisting of Dr. Vacher, Medical Officer of Health, Birkenhead; Mr. Henshaw, master plumber; and Mr. T. Anderson, operative plumber, to consider measures for co-operating with that Council in carrying out the registration of plumbers in Preston, and establishing classes for plumbers there.



## The Student's Column.

## TOWN DRAINAGE.

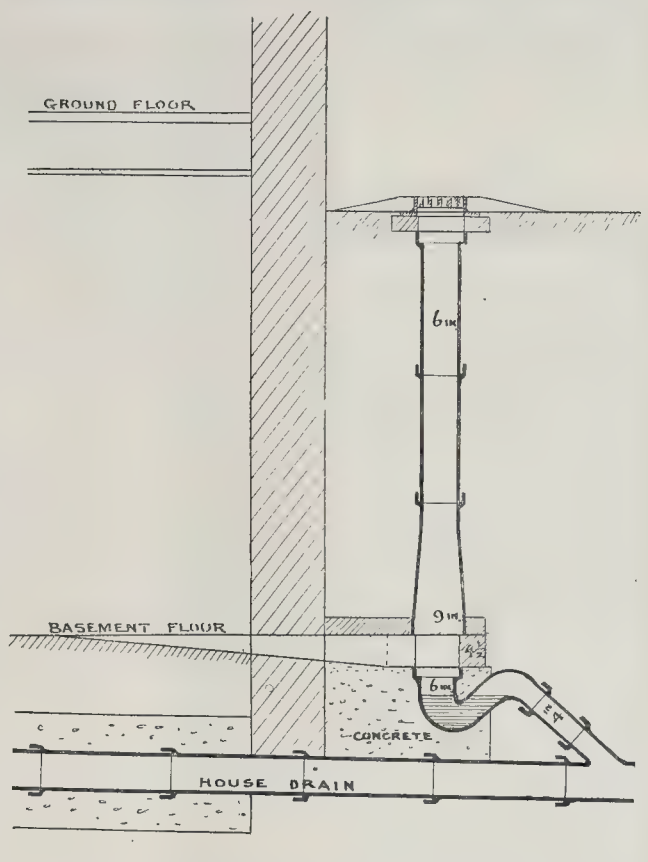
## XIV.—DRAINS UNDER HOUSES.

THE compartment of a gully-trap intended to retain the fat discharged from a scullery-sink by congealing it, is perhaps more often covered closely than with an open grating but there are two ways in which the fat is dealt with—the one by removing it occasionally through the top, the other by allowing it to remain long enough to become altered in character, whereupon it is broken up by water falling upon it either through the open grating or through a separate pipe, and being carried away into the drain. This is a sufficient provision in the case of small houses, while for large ones a larger trap is better, say 2 ft. by 18 in., and 18 in. deep, the middle compartment of which is closely covered. In such cases the quantity of fat is better worth the trouble of removing it; in the other case it is too small to be of any value, while equally troublesome to remove through the top, and it is better to let it pass into the drain. Besides the scullery-sink waste, provision is required to be made for receiving that of laundries, lavatories, urinals, housemaids' slop sinks, and butler's pantries, situated in different parts of the house, as well as from baths and water-closets previously named. All these should be received into the drain as near its head as the different situations make possible, the discharge being not directly into the drain, but first into a gully at the surface of the ground outside the house. The gully should be of a form which does not retain sediment, but delivers into the drain, as quickly as possible, everything coming into it, while preventing, by a dip into the water, at least 12 in. deep, of the upper part of the drain, the passage outwards there of the air of the drain, the course of which must be directed to the appointed outlet, by trapping all other openings on its course.

A drain should not be laid under a house floor if it can be laid by any other way, even though that may increase the length of the drain or diminish its rate of inclination; but where numerous separate requirements, such as those above named, are to be provided for, it is hardly possible to lay the drain by any other way, and when a drain must be laid under a house floor it should be surrounded with such a thickness—say 6 in.—of compact material as will prevent the possibility of escape of air from the drain. Clay is sometimes used for this purpose, tempered as if for making bricks, but stiffer; of such consistency as is understood in waterworks practice by "puddle." But concrete is preferable, and when it is considered that evaporation must go on continually from the damp clay beneath the floor into the warmer and drier air of the house, the preference is a reasonable one. The evaporation of the moisture of the puddled clay is not here referred to as doing any particular harm in the house, although it probably might, but as having the effect of destroying the compactness of the material and forming cracks through which air may escape from the drain if any joint be not perfect. Cast-iron pipes are sometimes used in such situations, laid completely through from front to back of a house. These, being in 9-ft. lengths, have the advantage of fewer joints than earthenware pipes, which are but 2 ft. long, unless especially required to be made 2 ft. 6 in. or 3 ft., which seems to be the limit for this material. The socket of a cast-iron pipe is 4 in. deep, the inner 2 in. being caulked with white spun yarn, and the outer 2 in. filled with melted lead, which, when cool, is "set up" within the socket nearly an eighth of an inch, to fill the space more perfectly with the lead, which contracts on cooling, and, under a great pressure of water, there would be leakage if the lead were not set up; and although in the case of a drain, there is no water pressure in such a pipe, or but little, it is advisable not to depart from the usual mode of laying cast-iron pipes, for though there may be no leakage of water, there might be an escape of air. The width of the space between the outside of the body of the pipe and the inside of the socket is not less than  $\frac{1}{8}$  in. If it were less, the lead would not run and fill the joint, nor could yarn or any other material be properly caulked in. If the sockets of ordinary rainwater piping be looked at, it will be seen that there is not more than  $\frac{1}{8}$  in. space for making the joint, and that such pipes are there-

fore unsuitable for use as a drain under a house floor or elsewhere. They might be strong enough, though they are cast as thin as it is possible to make them, but the want of room in the sockets for making a joint altogether prohibits their use for this purpose. When set vertically, and used as air-pipes, or for conducting rainwater from the roof-gutters to the ground, the same objection does not apply, but for a drain under a house floor, a cast-iron pipe, whether 4 in. or 6 in. diameter, should be of thick metal, not less than  $\frac{1}{4}$  in., and not less than  $\frac{1}{8}$  in. space in the sockets. A pipe-layer then has the opportunity of making a good joint.

The basement floors of houses have to be considered with reference to the nature of the ground which constitutes the site of the house, and whether it be drained in the manner already mentioned; but the most important thing to be ascertained is whether it is occupied for any domestic purpose, or may be so, in which water is used. In this case, an opening to the drain is necessary. If water for any purpose is used on the basement floor of a house, the waste should flow by an open channel into a gully outside the wall. When a basement floor is so used, there must almost necessarily be a window for light, and a sunk area, though often of small size, outside. In this area, if it extends low enough, the gully trap may be placed, to which a 4-in. branch can be extended from the drain outside the house. If, as is often the case, the small area outside the basement or cellar window does not extend much below the window-sill, while the gully trap must be sunk to the level required for draining the waste water into it from the floor, the position may be better changed to one away from the window area, a 6-in. pipe being brought up vertically from the gully to the surface, for access to the trap in case of need. The accompanying figure shows such a means of access, also a channel formed



in the basement floor, which conveys waste water out of the house into the gully-trap. The opening in the wall is  $4\frac{1}{2}$  in. wide and 3 in. high, in front of which, inside the house, a little door slides up and down within loose staples driven into the wall. A catch sets this open when required for the discharge of waste water.

The following instructions are given in the model by-laws in respect of drains beneath buildings (sec. 62): "Every person who shall erect a new building shall, in the construction of every drain of such building other than a drain constructed for the drainage of the sub-soil of the site of such building, use good sound pipes of glazed stoneware, or of other equally suitable material. He shall cause every such drain to be of adequate size, and, if constructed or adapted to be used for conveying sewage, to have an internal diameter not less than four inches, and to be laid in a bed of good concrete, with a proper fall, and with watertight, socketted, or other suitable joints. He shall not construct any drain so as to pass under any building, except in any case where any other mode of construction may be impracticable, and in that case he shall cause such drain to be so laid in the ground that there shall be a distance equal at the least to the full diameter thereof between the top of such drain at its highest point, and the surface of the ground under such building. He shall also cause such drain to be laid in a direct line for the whole distance beneath such building, and to be completely embedded in and covered with good and solid concrete, at least six inches thick all round. He shall likewise cause adequate means of ventilation to be provided in connexion with such drain at each end of such portion thereof as is beneath such building. He shall cause every inlet to any drain, not being an inlet provided in pursuance of the by-law in that behalf as an opening for the ventilation of such drain, to be properly trapped." In the sectio



already given the air-inlet between the front of the house and the sewer would be sufficient to comply with the above-named instruction in respect of "adequate means of ventilation" at the lower end of that portion of the drain which passes under the house, as it would not in any case be far away.

### Books.

*The History of Hampton Court Palace.* Vol. II. Stuart Times. Illustrated. By ERNEST LAW, B.A. London: G. Bell & Sons. 1888.

**I**N a former number we noticed at some length the first volume of Mr. Law's excellent and interesting work on Hampton Court, which treated of the history of the place from the earliest times to the end of the reign of Elizabeth. This volume was complete in itself, and it is an agreeable surprise to receive an equally bulky and interesting volume on Hampton Court during the Stuart period, together with an intimation that a third volume is to follow, continuing the subject from the accession of William III. to the present day. Few buildings in England are of more interest in themselves and in regard to their connexion with important historical events and personages.

While, however, there was a great deal of interesting information and illustration in the first volume in regard to the architectural history and embellishment of the palace, to which we referred at the time, reproducing one or two of the illustrations; this second volume, coming between the building of the earlier portions and the Renaissance facade, contains much less of architectural history, and is rather concerned with personal and social history concerning Charles I., Cromwell, and Charles II. and his very disorderly household, which is very well told and of great interest as a record of the manners of the time, but which is not within the subjects of which it is our special province to treat. We may however say that the volume is well worth reading in regard to the information it gives in social history, a good deal of which, though it may be familiar to students of the history of the period, is at all events not popularly known. A chapter of special interest in this respect is the description of the great masque entertainment given by James I. at the Palace, for which the scenery and mechanical appliances were probably designed by Inigo Jones, and in which twelve ladies of the Court enacted the part of twelve "Goddesses." This took place in the Great Hall, which was built up with various scenic erections for the occasion. At the gallery end was "a mountain" rising high into the roof and concealing the end wall; at the upper end was a Temple of Peace and the cave of "Somnus." The scene must have been a brilliant one for effect. When all the visitors were seated, the heralds flung open the doors and the King entered with a blast of trumpets, the whole company rising and bowing to him. The personages represented included "Night," who, in a mantle decked with stars, rose from a trap-door in the floor, and roused up Sleep to produce a vision; afterwards followed the twelve goddesses, Juno, Pallas, &c., preceded by the three Graces in silver garments. The chronicler who gives an account of it observes that Pallas was distinguished by the shortness of her skirts, which occasions a dry witticism on the subject. This should have been rather an attribute of Diana, the huntress. It seems that the conclusion of these entertainments was by no means in keeping with the state and decorum observed at the commencement, and that they often ended in a scene of little better than rioting.

To quit "these toys," as Bacon calls them, we may observe that the most important notice in this volume in regard to the Palace itself is the satisfactory evidence given that the long canal running from opposite the garden front of the Palace, with the avenue, was the work of Charles II., not of William, to whom it is generally accredited as a work carried out to please his Dutch taste for long canals. Mr. Law not only quotes Evelyn's remark as to "The Park, formerly a naked piece of ground, now planted with sweet roses of lime-trees, and the canal for water now near perfected," but gives an engraving from a contemporary view by one Dancker, showing the Tudor front of the Palace in the distance, and the canal running nearly up to it. The canal was shortened at the

Palace end when the semicircular garden was laid out subsequently.

Among the sights connected with Hampton Court at this period were the grand procession on the arrival of Charles II. and Catharine of Braganza at the Palace, of which an illustration is given from a contemporary etching by Dick Scoop, and the procession of the King and Queen from Hampton Court by water for their state entry into London, which Evelyn describes as "the most magnificent triumph that ever floated on the Thames," and he thought it far excelled the Bucentaur procession at Venice. These outward fêtes formed a satiric contrast to the real life of the unfortunate Queen; but it seems a pity that, while morals and manners have improved, we should have lost the taste for the magnificent display which used to characterise these water-fêtes of a former day.

An old view of the Palace from the river which is reproduced, as well as some of the remarks made by foreign visitors, convey the idea that in the aspect of Hampton Court as it then stood there was a certain degree of oriental richness and variety of outline. A foreign visitor in 1693 remarked that what struck him most in the Palace was the mass of towers, turrets, cupolas, pinnacles, and ornaments of all sorts, that produced a confusion that was not unpleasing. Judging from the old view referred to, this was a true criticism; and Wren's front was but a sober and unpoetical piece of work in comparison with the mediæval Palace. Mr. Law reminds us that the Bushey Park fountain formerly stood in the Palace grounds, and that there is no authority for calling it the "Fountain of Diana." In the inventory of 1693 it is described as "one large brasses (*sic*) Statue on the top of the Fontaine called Arethusa." Mr. Law suggests that as the statue holds a golden apple it is more probably intended for Venus. However, Diana it has been called since William III. set it up in the middle of the pond in Bushey Park, and Diana it will probably always be called.

We are indebted to Mr. Law for the continuance of a most interesting record of a most interesting building, which we hope he will soon be able to bring to a conclusion in the promised third volume. The whole makes a valuable record of the History of the Palace, with the additional merit of being capital reading.

*Cultur-Bilder aus dem Classischen Alter-thume. III. Die Gottedienstliche Gebrauche der Griechen und Römer.* Otto Seemann, Leipzig.

THERE is no end to the good service Professor Seemann does in popularising ancient lore. This, his last issue, is by no means the least useful. He deals simply and in quite popular fashion with matters that all educated people want to know about, but the original sources as to which are only accessible by prolonged study in out-of-the-way books. He has chapters on sacrifice, divination, purification, the mysteries, sacred processions, the ceremonies of death and burial, and the like, illustrated by the remains of ancient art. The book is quite elementary, and perhaps in consequence of this has no references; possibly the addition of such would too much have increased the cost. We are of opinion, however, that in this class of books, if references are out of the question, a page or two should always be devoted to a brief and well-chosen bibliography of the subject. The student may desire to go no further, but if he does, his needs should be considered.

*Sketches of Antique Furniture; Taken from Eighty Examples, not hitherto illustrated, chiefly of Seventeenth Century English Carved Oak.* By W. SHARP OGDEN, architect. London: B. T. Batsford. Manchester: John Heywood. 1888.

THIS is a collection of drawings of some exceedingly interesting examples of ancient furniture, mostly of a rather simple and unpretending character, but not the less valuable on that account, if they afford fresh hints how to make simple and unpretending things artistic. The examples are taken from Chetham College, Manchester; South Kensington Museum; Manchester Cathedral; St. Ann's Church, Manchester; Storer's Alma House, Melton Mowray; and from some private collections. If all these have not been before illustrated the collection is a useful addition to this class of illustrative

works. An exceedingly simple yet quaint old chair, from the "Feoffees' room" at Chetham College, is a delightful example which forms the frontispiece to the work. Two or three of the cabinets, settees, &c. are worth attention, and the oak front-door to Storer's Almshouses is very good.

It is unfortunate that the author has rather spoiled the effectiveness and clearness of his drawing by overdoing them with a network of lines, partly shading and partly indications of grain. Some of them are so overdone in this way that the detail is obscured, with no benefit to the effectiveness of the drawing. When it comes to shading-up a drawing which is in line, either it must be very laboriously and delicately done, or it should be left alone as much as possible. If the author publishes any more drawings of work of this type he should moderate his use of shading lines and aim at greater clearness of delineation, unless he feels disposed to execute very elaborate drawings with minutely finished detail. These are of neither one thing nor the other.

*Hints on Wood-carving, Chip-carving, and Recreative Classes: for Beginners.* By ELEANOR ROWE. Second edition, revised and enlarged.\*

THE second edition of this useful little manual by Miss Rowe, manager of the School of Wood-carving at the City and Guilds Institute, is considerably enlarged. As a practical book for beginners it is admirable. We wish that some of the simple designs given as examples had a little more artistic feeling. The "miniature grandfather's clock," a watch-stand (page 46), is very poor in design and taste, even for a simple thing. The examples of detail are better. The school over which the author presides, however, turns out really artistic work, so that the style of the rudimentary work suggested here does not seem to affect the ultimate work of the pupils. In fact, the volume is intended to be practical, as showing and describing the methods of manipulating tools and wood, in which respect it is excellent. When there is a third edition, perhaps a few of the illustrations of design in this one may be cancelled, and something better substituted.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

5,502, Mosaic Work, Marquetry, &c. Carl Wittowsky (Berlin).

By this invention two different pieces of inlaid work are obtained, one with a dark pattern on a light ground and the other with a light pattern on a dark ground. A great loss of time is avoided, and the pattern is cut out of one piece of wood. The piece thus cut is placed upon the article to be decorated and the pattern pressed in. By this pressing of the pattern into the wood, between which glue or other adhesive substance is placed, an even surface with an inlaid pattern on it is obtained. The essential part of the invention is the pressing of one piece of wood on which the pattern is cut into another plain piece, between which glue or other fastening substance is placed.

5,878, Enamel Paints and Varnishes. Thomas Fisher.

The paints which are the subject of this invention are doodorised, and an agreeable perfume is imparted to them. To doodorise them, they are heated before introducing the colours and pigments, so as to evaporate the greater portion of the spirit in which they are mixed, and, after introducing the colours or pigments while the mixture retains some of its heat, a perfume is poured into it, and the paint is enclosed in airtight canisters, and the perfume is afterwards further diffused through the mixture by shaking the canisters.

5,947, Glazing Bars or Astragals for Corrugated or other Sheets of Glass in Roofing, &c. A. Drummond.

Many modifications in the form and fixing of astragals are shown in the drawings accompanying the specification of this invention, the object of which is chiefly to adapt to corrugated sheets the astragals previously patented for use with flat sheets of glass. The form of the bar is altered so that the corrugations form an increased tie. A cap is formed of two independent strips or sheets of metal, both portions of the cap being slid into and held in place by the astragal. It also incorporates the method of glazing structures, wherein the glass is first sup-

\* To be obtained at the School of Art Wood-carving City and Guilds Institute, South Kensington.



ported on a hollow astragal, a "double strip" cap being then slipped into said astragal, and so bent over as to firmly secure the glass, which is prevented from slipping by a stop-piece secured to the purchase bars.

#### 6,142, Fireplaces. J. T. Hamblin.

For boiler fireplaces, the grate is, according to this invention, arranged about on a level with the floor. For fire heating, the grate is arranged a little below the floor. Applied to ordinary domestic fireplaces, an air-supply flue is carried in from without to a closed chamber, the top of which is formed by the grate, so that the air issues up between the bars of the same. The back of the fireplace is continued at a short distance above the bottom of the fireplace in a sloping-forward direction, the rising flame being compelled to strike against this part, which should be lined with fire-brick. The front back then slopes into the usual flue. The front part of the fireplace is continued down to about the point where the two slopes meet, leaving a rather narrow throat between. This front part is removable for facility of sweeping. Air is drawn from outside the apartments into a chamber, and, after heating, is circulated among the batons, joists, &c., and the room is warmed.

#### 6,229, Moulding Basins, &c. T. W. Twyford.

In the ordinary form of earthenware closets-basins the water-pressure required to cleanse them is considerable, and corner spaces are left wherein soil or other substances accumulate, thereby making the trap foul. By the present invention the trap, basin-outlet, and shell are formed in one piece, and peculiarly arranged for compactness and convenience in its several parts. No corners are left, but the whole is constructed, arranged, and fitted to avoid the defects commonly complained of in other patterns.

#### 6,629, Roofing Slabs, Tiles, &c. J. Elliott.

According to this invention, boulders, hard stone, or flints from the sea-shore are soaked and crushed while wet, mixed with Portland cement, and the mixture cast or run into moulds. They are not burnt, but simply dried in the open air, thus retaining their shape. The tiles or slabs are made of a special shape, rebated on the edge for security in fixing.

#### NEW APPLICATIONS FOR PATENTS.

March 18.—4,663, R. Little, Mortising Chisel.—4,683, H. Ellis, Fireproof and Non-combustible Asbestos Wall and Ceiling Papers.—4,730, W. Townsend, Wind-gauge Chimney-pots.—4,738, J. Kesne, Spring Hinges.

March 19.—4,797, C. Lott, Window-sash Steadier.—4,806, Sir E. Harland, Elastic Tiles.—4,817, C. Cole, Band-saw Setting Machine.

March 20.—4,856, G. Connell, Flue Ventilators.—4,881, J. Parker, Moulds for Pressing Bricks, &c.—4,885, J. Burnett, Alarm Apparatus for Doors, Windows, &c.—4,895, J. Marks, Fasteners for Doors, &c.

March 21.—4,905, J. Taft, Self-closing Doors.—4,913, C. Elliott, Glazing, &c.—4,946, R. Clunis, Bricks.—4,947, R. Clunis, Drain and other Pipes and Pipe Joints.—4,957, W. Lindsay, Bridges, Floorings, &c.—4,958, W. Lindsay, Glazed Structures and in Sash-bars for same.

March 23.—5,058, T. Buchan, Valves for Cisterns for Flushing Water-closets, &c.—5,068, R. Blyth, Automatic Sash-fastener.—5,073, G. Wallis, Ventilation and Flushing of Sewers.—5,076, F. Fry, Window-sash Fasteners.—5,083, W. Dunn, Water-closets.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

1,768, H. Hind and E. Jones, Window-fasteners.—2,039, F. Self, Jun., Window-fastener.—2,556, W. Wernick, Wood Pavement.—2,884, W. Perrot, Sash-fastenings for Windows.—2,946, H. Lake, Machines for making Bricks, Tiles, &c.—3,156, J. Kidd, Sash-fastener.—3,234, T. Dykes, Sash-fastener.—3,241, T. Day, Window-fastener.—3,254, E. Showell, Indicating Bolts or Fasteners.—3,332, A. Shaver, and J. Parkinson, Ventilating Rooms, &c.—3,432, O. Brindley, Door-fasteners.—3,601, J. Butler, Extracting Cows for Chimneys.—3,602, E. Cattley, Automatic Sash-fastener.—3,653, D. Boyd, Sash-fastener.—3,741, F. Marshall, Securing Knobs and Handles on Door-spindles.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

7,165, G. Couch, Window Sashes and Frames, &c.—7,327, H. Carew and F. Potts, Safe-guard Disinfecting and Sanitary Brick or Building Block.—7,398, L. Avenarius, Wood-preserving Paints.—12,225, K. Bernhard, Safety Contrivance for Windows.—15,725, S. Worsenroft, Cows or Ventilators.—2,379, H. Potter and E. Assmann, Brick-making Machines, &c.—2,632, J. Sugden, Artificial Building Materials.—2,890, G. Robinson and H. James, Window-fasteners.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.\*

MARCH 22.—By Mr. J. MORRAY, at Sutton.  
Buton—Ringstead-rd., a plot of freehold land ..... £125  
By VENTON, BULL, & COOPER.  
St. John's Wood—l. gr., 438 p.a., ut. 55 yrs. .... 1,760  
L. gr. of 414 p.a., ut. 65 yrs. .... 285

MARCH 25.—By ROGERS, CHAPMAN, & THOMAS.  
West Kensington—34, Talgarth-rd., ut. 87 yrs.,  
g.r. £10, 10s., r. £25 ..... 500  
23 shares of £10 each in Architectural Union Co.,  
Limited ..... 230  
Harrow-road—11 and 12, Carlton-ter., ut. 56 yrs.,  
g.r. £16, unlet ..... 650

MARCH 26.—By C. D. FINE & SONS.  
Tottenham—l. gr. £22, reversion in 88 yrs. .... 535  
Borough—75, High-st., f. r. £175 p.a. .... 2,620  
By BARRELL & TAYLOR.  
Croydon—32 and 33, Oval-rd., ut. 78 yrs., g.r. £13,  
r. £46 ..... 480

By DABRYN, TAYLOR, & CO.  
South Kensington—5, Bolton-gardens-mews, ut.  
48 yrs., g.r. £4 p.a. .... 170

By A. RICHARDS.  
Tottenham—24, Asphord-rd., f. r. £26, 10s. p.a. .... 250  
Islington—279, Liverpool-rd., f. r. £30 p.a. .... 970  
West India Dock-road—Nos. 29 and 31, ut. 81 yrs.,  
g.r. £10 p.a., r. £45 ..... 180

By B. BROWN.  
Millwall—43, West Ferry-rd., ut. 35 yrs., g.r. £1  
p.a., r. £22 p.a. .... 115  
46, 47, and 49, West Ferry-rd., and 1 and 11,  
Tobago-st., ut. 29 yrs., g.r. £11, 10s., r. £124  
p.a. .... 670

3, Tobago-st., ut. 29 yrs., g.r. £2, 10s., r. £23  
10 to 18 (even), Tobago-st., and 1 to 13 (odd),  
Byng-st., ut. 37 yrs., g.r. £27, r. £53 p.a. .... 1,600

By FULFILL & FULFILL.  
Hackney—60, North-st. and 1 and 2, East-st., f. r.  
£54, 12s. p.a., ut. 14 yrs., g.r. nil, r.  
£80 p.a. .... 350  
Hackney—81, Lauriston-rd., ut. 65 yrs., g.r. £7, r.  
£42 p.a. .... 240

29, Chand-rd., ut. 37 yrs., g.r. £4, r. £34 p.a. .... 300  
Bermundsey—L. gr. £13, ut. 15 yrs. .... 175

MARCH 27.—By J. DEAN.  
Clerkenwell—The lease and plant of 11, Gloucester-  
st., ut. 6 yrs., r. £150 ..... 85  
By J. G. & A. PARVOST.  
West Ham—41, Stophord-rd., f. r. £18 p.a. .... 305  
48, Stophord-rd., f. r. possession ..... 335

By R. A. NOTLEY.  
Camden Town—4 and 6, Marquis-rd., ut. 52 yrs.,  
g.r. £12, r. £24 p.a. .... 530

MARCH 28.—By J. J. JENKINS, SON, & ELIAS.  
Rotherhithe—11, Elephant-lane, f. r. £20 p.a. .... 670

By THOROUGH & MARTIN.  
Croydon—111, South End, f. r. £55 p.a. .... 120  
113, 115, 117, 119, and 125, South End, f. r. £50  
p.a. each ..... 3,275

127 and 129, South End, f. r. £45 p.a. each ..... 1,225  
131, South End, f. r. £40 p.a. .... 605

By OAKLEY, FISHER, & CO.  
Wandsworth—l. gr. of £30 p.a., reversion in 72 yrs.  
to £304 p.a., also reversion in about 73 yrs.  
to £688 p.a. .... 1,350

By WATSON & SON.  
Old Kent-road—Nos. 643 and 645, ut. 17 yrs., g.r.  
£4, 15s., r. £48 p.a. .... 550  
Peckham—14, Middle-rd., ut. 98 yrs., g.r. nil, r.  
£28 p.a. .... 295

63, Sumner-rd., ut. 71 yrs., g.r. £3, 2s., r.  
£28, 12s. p.a. .... 290  
1, Alder-st., ut. 71 yrs., g.r. £3, 2s., r. £28, 12s. p.a. .... 210

Old Kent-road—21, 21, and 22, Rivet-st., and a l. gr.  
of 48 p.a., ut. 26 yrs., f. r. £12, r. £78, 4s. p.a.  
Blackfriars—7, 10, 11, 12, and 13, Hatfield-pk.,  
7 yrs., g.r. £19, 8s., r. £104 p.a. .... 85  
4 and 27, Cross-st., ut. 1 yr., g.r. £9, r. £7, ut. 20  
yrs. .... 290

By C. C. & T. MOORE.  
Horton—68, 60, and 62, Mitten-rd., ut. 20 yrs.,  
g.r. £10, 10s., r. £77 p.a. .... 510  
Stepney—60, Bromley-rd., ut. 18 yrs., g.r. £2, r.  
£30 p.a. .... 200  
69, Bromley-rd., ut. 18 yrs., g.r. £2, r. £28 p.a. .... 215

By E. STIMSON.  
Peckham Rye—L. gr. of £137, 10s., g.r. £6, ut. 99 yrs.  
Clerkenwell—39 and 40, Sekford-st., ut. 25 yrs.,  
g.r. £12, r. £100 p.a. .... 610

City-road—35 and 37, Hall-st., ut. 53 yrs., g.r. £12,  
r. £70 p.a. .... 820  
Battersea—12 and 13, Freeland-st., f. r. £40 p.a. .... 400

New Cross—67 and 60, Somerville-rd., ut. 61 yrs.,  
g.r. £7, r. £50, 12s. p.a. .... 390  
Stanford Hill—1 and 2, Melrose-villas, ut. 59 yrs.,  
g.r. £15, r. £30 each p.a. .... 380

2 to 5, 7 and 8, Melrose-villas, ut. 89 yrs., g.r.  
£45, r. £30 each p.a. .... 1,075  
16 to 30 (even), Priory-rd., ut. 89 yrs., g.r. £39,  
r. £105, 8s. p.a. .... 680

16, 17, and 19, Priory-rd., ut. 89 yrs., g.r.  
£10, 10s., r. £34, 12s. p.a. .... 195  
2 to 12 (even), Priory-rd., and a g.r. of £8, ut. 1,  
89 yrs., g.r. £30, r. £110, 14s. .... 370

By NEWSON & HARDING.  
Islington—269, Liverpool-rd., f. r. £50 ..... 675  
Pentville—43, Holford-sq., and Holford-villa, ut.  
43 yrs., g.r. £10, r. £125 p.a. .... 1,045

Kensish Town—2, Dickenson-st., ut. 79 yrs., g.r.  
£5, r. £32 p.a. .... 295

\* Contractions used in this list: "f. r." for "freehold ground-rent"; "l. gr." for "leasehold ground-rent"; "g. r." for "improved ground-rent"; "g. r." for "ground-rent"; "r." for "rent"; "ut." for "years"; "p. a." for "per annum"; "yrs." for "years"; "st." for "street"; "rd." for "road"; "sq." for "square"; "pl." for "place"; "ter." for "terrace"; "yd." for "yard"; &c.

Holloway—10, Bedford-ter., f. r. £33 p.a. .... £380  
5, Middlesex-st., f. r. £35 p.a. .... 470  
31 and 33, Durham-rd., f. r. £20 p.a. .... 585  
13, 15, and 17, Westfield-rd., f. r. £101 p.a. .... 585  
33 to 39 (odd), Westfield-rd., f. r. £206 p.a. .... 920  
F. r. of £3 p.a., reversion in 68 yrs. to a. r. of  
£23 p.a. .... 200  
F. r. of £10 p.a., reversion in 78 yrs. to a. r. of  
£23 p.a. .... 245  
F. r. of £12 p.a., reversion in 80 yrs. to a. r. of  
£23 p.a. .... 305  
F. r. of £9 p.a., reversion in 78 yrs. to a. r. of  
£20 p.a. .... 215  
F. r. of £10 p.a., reversion in 72 yrs. to a. r. of  
£23 p.a. .... 250  
F. r. of £12, 12s. p.a., reversion in 78 yrs. to a. r. of  
£20 p.a. .... 315  
F. r. of £12, 12s. p.a., reversion in 81 yrs. to a. r. of  
£24 p.a. .... 315

MARCH 29.—By ELLIS & SON.  
West Smithfield—Nos. 58 and 59, f. r. £210 p.a. .... 5,750  
Whitechapel—97, Turner-st., ut. 21 yrs., g.r. £3,  
r. £35 ..... 105

Tottenham—5 to 9, Sidney-ter., ut. 84 yrs., g.r.  
£17, r. £78, No. 9 is freehold ..... 350

#### MEETINGS.

##### SATURDAY, APRIL 6.

St. Paul's Ecclesiastical Society.—Visit to the Church of St. Cuthbert, Fulbeach-gardens, Warwick-road (Earl's Court Station), and to the Church of St. Paul, Fulham. Association of Public Sanitary Inspectors.—Mr. C. MacMahon on "The Selected Candidate."  
M.A. F.R.S., on "Experimental Optics (Polarization; Wave Theory)." VII. 3 p.m.

##### MONDAY, APRIL 8.

Royal Institute of British Architects.—Special General Meeting of members only (1) to receive and consider the recommendations of the Council to admit to alliance with the Royal Institute of British Architects the following non-metropolitan societies, viz.:—1, Sheffield Society of Architects and Surveyors; 2, Leicester and Leicestershire Society of Architects; 3, Manchester Society of Architects; 4, Glasgow Institute of Architects; 5, Northern Architectural Association (Newcastle); 6, Bristol Society of Architects; 7, Nottingham Architectural Society; 8, Royal Institute of the Architects of Ireland (Dublin); 9, Liverpool Architectural Society. (2) To receive and consider the report of the Education Committee, as adopted by the Council on March 4, 1889.  
Society of Arts (Lecture Series).—Mr. C. V. Boys, F.R.S., on "Instruments for the Measurement of Radiant Heat." III. 8 p.m.

##### TUESDAY, APRIL 9.

Society of Arts (Applied Art Section).—Mr. H. H. Statham on "Architecture in Relation to Landscape." 8 p.m.  
Institution of Civil Engineers.—Sir N. Barnaby on "Armour for Ships." 8 p.m.  
Sanitary Institute (Lectures for Sanitary Inspectors).—Mr. J. F. J. Sykes, B.Sc., on "Nature of Nuissances, including Nuisances the abatement of which is difficult." 8 p.m.  
Birmingham Architectural Association.—Paper by Mr. J. A. Golch.

##### WEDNESDAY, APRIL 10.

Society of Arts.—Sir Douglas Galton on "The Sanitary Functions of the County Councils." 8 p.m.  
Inventors' Institute.—8 p.m.

##### THURSDAY, APRIL 11.

Royal Institution.—Professor J. H. Middleton, M.A., on "Houses and their Decoration from the Classical to the Medieval Period." IV. 3 p.m.  
Society for the Encouragement of the Fine Arts.—Mr. W. L. Baylis, F.R.S., on "At the Cathedral Door." 8 p.m.  
Society of Antiquaries.—9.30 p.m.  
Institution of Electrical Engineers.—Mr. J. B. Verity on "Underground Cables and Electrical Conductors." 8 p.m.

##### FRIDAY, APRIL 12.

Sanitary Institute.—Mr. A. Haviland, on "The Bagshot Sands in relation to Health." 5 p.m.  
Sanitary Institute (Lectures for Sanitary Inspectors).—Mr. A. Wynter Blyth, on "Sanitary Law—General Enactments, Public Health Act, 1875, Model By-laws." 8 p.m.  
Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Iridescent Crystals."

##### SATURDAY, APRIL 13.

Royal Institution.—The Rt. Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarization; Wave Theory)." VIII. 3 p.m.

#### Enlargement of the Royal Pier.

Southampton.—The Special and General Works Committee of the Southampton Harbour Board lately decided to recommend, acting upon the report of Sir Douglas Fox, that the premium of 100 guineas offered for the plans for the extension of the Royal Pier should be awarded to Mr. W. Fairley, of Edinburgh. This recommendation was adopted at a subsequent board meeting. The work of enlargement will therefore proceed upon the lines of Mr. Fairley's plans. Sir Douglas Fox advised that these plans possessed distinct advantages over those sent in by the other competitors, and this opinion was endorsed by the committee and the whole Board. The present structure will remain, after being strengthened, and the extension will take place on the upper or north-western side. The present pier projects in a south-westerly direction for some distance, and then turns off to the southward. The new part will continue on the south-westerly line, and will extend to a considerable distance beyond the present pontoon, which will be retained.



## Miscellaneous.

**Applied Mechanics.**—In connexion with the Paris Exhibition there is to be held, at the Conservatoire des Arts et Métiers, an International Congress of Applied Mechanics, under the patronage of a Committee of Honour, comprising savants and engineers of renown, both from France and from other countries. The President of the Committee on Organisation is M. Phillips, ex-Inspector-General of Mines. Among the subjects submitted for discussion are the unification of horse-power; the choice of materials in machine construction; the mechanical production and utilisation of artificial cold; transmission to a distance, and distribution, of work, by other means than electricity (water, air, steam, cables, &c.); automatic cut-off engines with several successive cylinders; thermo-motors other than the steam-engine. Other topics, treated by papers, will be improvements in steam-engines since 1878; progress among associations of owners of steam appliances; and improvements in apparatus for the generation of steam (more particularly sectional boilers).

**Robert Boyle & Son, Limited.**—The directors of Robert Boyle & Son, Limited, ventilating engineers, London and Glasgow, have resolved to pay an instalment on account of dividend at the rate of 12 per cent. per annum, free of income-tax, for the half-year ending March 31 last, which has been the most prosperous since the formation of the company. The company have at present some important ventilating contracts in hand and in prospect, the managing director, Mr. Robert Boyle, having just departed for the United States, where the Pennsylvania Railroad Company propose to apply the system on their lines, the air-pump ventilator being already adopted in a number of important public buildings in America, one of the most recent being the Layton Art Gallery, Milwaukee, Wisconsin. We are informed that Mr. Boyle, after establishing agencies in Mexico, also in San Francisco, Salt Lake City, and other Western towns, proceeds to Canada to make an examination of the House of Parliament, Ottawa, for the purpose of preparing a scheme for the ventilation of that building.

**New "Central Hall," Holborn.**—Having failed of its original purpose as a horse and carriage repository, the New Royal Amphitheatre, in High Holborn, was opened, Mr. Thomas Smith being the architect, on May 25, 1887, for dramatical and equestrian performances. The house subsequently passed through a somewhat varied career by names, in turn, of the National, the Connaught, the Alcazar, and the Holborn Theatre. Its site, together with those of two adjacent courts, and some premises in Eagle-street, at the rear, was lately appropriated for a new building, erected after Mr. E. Tyler's designs. This building, to be known as the Central Hall, has been adapted for the holding of exhibitions and similar entertainments, and was reopened on Saturday, March 30, last. A large room upon the upper floor is being fitted for the holding of concerts, meetings, &c.

**New Mission Church at Ashted, Birmingham.**—The Bishop of Worcester recently opened a small mission-room which has been built in Dollman-street, Ashted, at a cost, with that of its site, of about 1,100*l*. The mission is in connexion with the Church of St. James, Ashted. The parish has a population of 16,000, and, since the new building is destined to serve a particular section of the parish which includes 5,000 persons, the site acquired is large enough for the subsequent erection of a church, of which the mission-room would form one transept. It is an absolutely plain structure, with brick masonry, and roof and floor of wood. The architects have been Messrs. Osborn & Heading, and the builders Messrs. Barnsley & Sons. A congregation of about 300 people may worship in the room.

**Appointment.**—Mr. Charles Mayne, of the Engineer and Surveyor's Department of the Hornsey Local Board, has been appointed Engineer and Surveyor to the Municipal Council of Shanghai. There were 150 applications for the post. Sir James Brunlees, F.R.S.E., acting for the Council, forwarded to them the names and testimonials of three candidates, the final appointment being made by the Council at Shanghai. This is the second assistant from the same office who has recently obtained an official appointment, Mr. E. H. Dorman having also secured the appointment of County Surveyor of Armagh.

**A Public Steam Laundry** has just been opened at Hertford for the town and district, replete with every appliance and convenience for carrying on a very extensive business. It has been fitted by Messrs. Bradford & Co. with machinery for washing, drying, ironing, and mangling, and with all their most recent improvements. The revolutions of the hydro-extractor are about sixteen per second. The boiler is of 20-horse power, with a chimney 66 ft. in height. The electric lighting is upon the incandescent system, worked by a vertical engine of 4-horse power. The work, with entrance-lodge and stables, has been carried out by a local builder, Mr. H. Norris, from designs by Mr. Wm. White, F.S.A.

**Glasgow Archaeological Society.**—The usual monthly excursion of the Society took place a few days since, when a visit was paid by the invitation of Mr. J. Guthrie Smith, F.S.A. Scot., to the old castle of Mugdock, for centuries one of the principal residences of the chiefs of the house of Graham. Despite the fact that the day was extremely wet, a considerable number of the members were present. Proceeding by train to Milngavie, the party was met on the outskirts of the village by Mr. Guthrie Smith, who conducted the visitors to Mugdock. During the course of the Society's visit an interesting paper on the history and architectural characteristics of the castle was read by Mr. Guthrie Smith.

**The New Christiansborg Palace.**—The jury having the designs for the new Christiansborg Palace at Copenhagen under consideration has come to the conclusion that none of those sent in can be finally accepted, although prizes have been awarded for the three best. Consequently a final competition will take place. It has further been decided that the new palace shall not, as originally contemplated, also accommodate the Houses of Parliament, for whom a building will be erected elsewhere, but be solely a royal residence, and to that end the exterior is to be more magnificent than at first contemplated, and a handsome central tower added.

**Swedish Building Law.**—By the new Swedish law of building, no public buildings may in future be erected without the Architectural Board of Sweden having approved of the designs. Among such buildings are, besides all official ones, churches, chapels, universities and colleges, as well as statues and fountains in public squares. All interior arrangements must also be approved, and the work always be open to inspection. None of these buildings must be of wood. Moreover, the contracting builder is responsible at law for the carrying out of the work in accordance with the approved plans, and for its solidity until five years after completion.

**Stained Glass.**—St. Peter's Church, Eaton-square, has lately received an addition to its internal decoration by piercing the east wall and inserting a three-light stained-glass window. The subject represented is the Holy Women at the Sepulchre, and the work has been designed and executed by Messrs. Mayer & Co.—A stained-glass window, the subject of which is "The Journey to Emmaus," designed after Hoffman, has just been placed in the New Jerusalem Church, Kensington, to the memory of the late pastor, the Rev. Dr. Bayley. The work has been carried out by Messrs. Winfields, of London and Birmingham.

**A Memorial Brass at Exeter.**—A memorial brass, surrounded by a frame of carved and polished alabaster, and surmounted by the family arms and crest, has been erected in St. Petrock's Church, Exeter, to the memory of an old Exonian and his wife. It is fixed at the north-east end of the nave, and records that Samuel Thomas Gilbert, and his wife, Mary Ann Bond, died in the years 1840 and 1829 respectively. The work has been carried out by Mr. Harry Hems, of Exeter, at the expense of their surviving son, Dr. Gilbert, Mus. Doc., New York.

**Minneapolis.**—A monster house is being erected at Minneapolis. It covers an area of 80 ft. square, and will be 350 ft. high, divided into twenty-eight stories. Two iron staircases lead from bottom to top, but there will also be twelve passenger lifts, by means of which the highest story will be reached in thirty seconds. The structure is to consist of 728 rooms, and consists of iron skeleton framing filled in with brickwork. Only the doors and windows are of wood. The building is constructed strong enough to admit of additional stories if required.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                     |           | £. | s. | d. | £. | s. | d. |
|---------------------------------------------|-----------|----|----|----|----|----|----|
| Greenheart, H.G.                            | ton       | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                                  | load      | 10 | 0  | 0  | 13 | 0  | 0  |
| Sequoia, U.S.                               | foot cube | 0  | 2  | 3  | 0  | 3  | 8  |
| Do. Canada                                  | do.       | 3  | 10 | 0  | 8  | 0  | 0  |
| Birch                                       | load      | 3  | 10 | 0  | 8  | 0  | 0  |
| Elm                                         | do.       | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Danzig, &c.                            | do.       | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak                                         | do.       | 2  | 10 | 0  | 4  | 0  | 0  |
| Canada                                      | do.       | 5  | 10 | 0  | 7  | 10 | 0  |
| Pine, Canada red                            | do.       | 3  | 5  | 0  | 4  | 0  | 0  |
| Do. yellow                                  | do.       | 3  | 10 | 0  | 5  | 10 | 0  |
| Lath, Danzig                                | do.       | 4  | 10 | 0  | 6  | 10 | 0  |
| St. Petersburg                              | do.       | 5  | 0  | 0  | 6  | 10 | 0  |
| Wainscot, Riga, &c.                         | log       | 2  | 15 | 0  | 4  | 5  | 0  |
| Do. Odessa, crown                           | do.       | 0  | 0  | 0  | 0  | 0  | 0  |
| Do. Finland, 2nd and 1st, std. 100          | do.       | 9  | 10 | 0  | 11 | 0  | 0  |
| Riga                                        | do.       | 8  | 0  | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow                  | do.       | 11 | 10 | 0  | 15 | 0  | 0  |
| Do. 2nd                                     | do.       | 10 | 0  | 0  | 11 | 0  | 0  |
| Swedish                                     | do.       | 8  | 10 | 0  | 10 | 0  | 0  |
| White Sea                                   | do.       | 9  | 0  | 0  | 18 | 0  | 0  |
| Canada, Pine, 1st                           | do.       | 16 | 0  | 0  | 26 | 10 | 0  |
| Do. 2nd                                     | do.       | 11 | 0  | 0  | 17 | 10 | 0  |
| Do. 3rd, &c.                                | do.       | 8  | 0  | 0  | 10 | 10 | 0  |
| Spruce, 1st                                 | do.       | 9  | 10 | 0  | 11 | 0  | 0  |
| Do. 3rd and 2nd                             | do.       | 7  | 10 | 0  | 9  | 10 | 0  |
| New Brunswick, &c.                          | do.       | 6  | 15 | 0  | 8  | 15 | 0  |
| Battens, all kinds                          | do.       | 6  | 10 | 0  | 20 | 0  | 0  |
| Flooring Boards, 9q., 1 in. prepared, First | do.       | 0  | 11 | 0  | 0  | 14 | 8  |
| Second                                      | do.       | 0  | 8  | 0  | 0  | 10 | 8  |
| Other common                                | do.       | 0  | 8  | 0  | 7  | 0  | 0  |
| Cedar, Cuba                                 | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| Honduras                                    | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| Mahogany, Cuba                              | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| St. Domingo, cargo average                  | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| Mexican                                     | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| Tobacco                                     | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| Honduras                                    | do.       | 4  | 0  | 13 | 0  | 0  | 0  |
| Box, Turkey                                 | do.       | 0  | 0  | 4  | 0  | 4  | 0  |
| Rose, Rio                                   | do.       | 15 | 0  | 0  | 20 | 0  | 0  |
| Bahia                                       | do.       | 14 | 0  | 0  | 18 | 0  | 0  |
| Sisal, St. Domingo                          | foot      | 0  | 0  | 4  | 0  | 4  | 0  |
| Porto Rico                                  | do.       | 0  | 0  | 9  | 0  | 1  | 8  |
| Walnut, Italian                             | do.       | 0  | 0  | 4  | 0  | 4  | 0  |

| METALS.                      |     | £. | s. | d. | £. | s. | d. |
|------------------------------|-----|----|----|----|----|----|----|
| Iron—Bar, Welsh, in London   | ton | 5  | 5  | 0  | 5  | 10 | 0  |
| Do. at works in Wales        | do. | 4  | 15 | 0  | 5  | 0  | 0  |
| Do. Staffordshire, in London | do. | 5  | 10 | 0  | 5  | 10 | 0  |
| COPPER.                      |     |    |    |    |    |    |    |
| British, cake and ingot      | ton | 45 | 0  | 0  | 46 | 0  | 0  |
| Best selected                | do. | 46 | 10 | 0  | 47 | 0  | 0  |
| Australian                   | do. | 0  | 0  | 0  | 0  | 0  | 0  |
| Chilled                      | do. | 0  | 0  | 0  | 0  | 0  | 0  |
| YELLOW METAL.                |     |    |    |    |    |    |    |
| Lead—Pig, Spanish            | ton | 12 | 7  | 6  | 0  | 0  | 0  |
| Do. common brands            | do. | 12 | 6  | 0  | 0  | 0  | 0  |
| Sheet, English               | do. | 13 | 10 | 0  | 14 | 0  | 0  |
| SPRINTER.                    |     |    |    |    |    |    |    |
| Silesian, special            | ton | 17 | 0  | 0  | 17 | 6  | 0  |
| Ordinary brands              | do. | 16 | 15 | 0  | 17 | 0  | 0  |
| TIN.                         |     |    |    |    |    |    |    |
| Straits                      | do. | 95 | 0  | 0  | 0  | 0  | 0  |
| Australian                   | do. | 95 | 0  | 0  | 0  | 0  | 0  |
| English ingots               | do. | 97 | 0  | 0  | 0  | 0  | 0  |
| ZINC—English sheet           | ton | 21 | 0  | 0  | 22 | 0  | 0  |

| OILS.                  |        | £. | s. | d. | £. | s. | d. |
|------------------------|--------|----|----|----|----|----|----|
| Linseed                | ton    | 18 | 5  | 0  | 18 | 10 | 0  |
| Cocount, Cochiti       | do.    | 27 | 0  | 0  | 23 | 0  | 0  |
| Ceylon                 | do.    | 25 | 10 | 0  | 25 | 15 | 0  |
| India, Laps            | do.    | 25 | 10 | 0  | 25 | 10 | 0  |
| Rapeseed, English pale | do.    | 22 | 5  | 0  | 0  | 0  | 0  |
| Do. brown              | do.    | 26 | 15 | 0  | 0  | 0  | 0  |
| Cottonseed, refined    | do.    | 24 | 10 | 0  | 25 | 10 | 0  |
| Tallow, Old Oleine     | do.    | 19 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S.      | do.    | 5  | 0  | 0  | 6  | 0  | 0  |
| Do. refined            | do.    | 7  | 0  | 0  | 12 | 0  | 0  |
| Tar—Stockholm          | barrel | 1  | 2  | 0  | 1  | 2  | 6  |
| Archangel              | do.    | 0  | 14 | 6  | 0  | 14 | 6  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BRAY (Co. Wicklow, Ireland).**—For teacher's residence, St. Andrew's School, Bray, Co. Wicklow, Mr. W. W. Kaye Parry, M.A., architect, Dublin:—  
Stephen Adams, Dublin ..... £235 16  
James Kierans, Dublin ..... 485 0 0  
T. Wardrop & Sons, Dublin ..... 1 80 0  
John Bain, Dublin ..... 450 0 0  
Henry Pemberton, Ballybrack ..... 449 0 0  
Isaac Jones, Bray ..... 325 0 0  
B. Brady & Sons, Bray ..... 350 0 0

**CARDIFF.**—For additions to the Cardiff Union Workhouse. For the Cardiff Board of Guardians. Messrs. Seward & Thomas, architects, Cardiff. Quantities by the architect:—  
Richard Smith ..... £11,675 17 0  
John Hopkins ..... 11,115 0 0  
Jones Bros. .... 11,000 0 0  
Shepherd & Son ..... 10,650 0 0  
James Allen ..... 10,325 19 10  
D. J. Davies ..... 10,500 0 0  
Shepherd & Son ..... 10,281 0 0  
Bowers & Co. .... 10,075 0 0  
Stephens, Bastow, & Co. .... 9,998 0 0  
David Davies ..... 9,880 0 0  
C. C. Dunn ..... 8,999 10 5  
John Haines ..... 8,975 0 0  
E. Turner & Sons ..... 9,838 0 0  
Wm. Symonds ..... 9,600 0 0  
C. Burton (accepted) ..... 9,350 0 0  
[All of Cardiff, except Messrs. Bowers & Co., Hereford, and Stephens, Bastow, & Co., Bristol.]

**COBHAM.**—For wood-ribbed ceilings in hall and dining-room, at Brackenhurst, Cobham, for Mr. E. H. Lushington, Mr. J. A. Stenhouse, architect:—  
C. Hindley & Sons (accepted) ..... £190 0 0



# COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## COMPETITIONS.

| Nature of Work.      | By whom Required.   | Premium.   | Designs to be delivered. | Page. |
|----------------------|---------------------|------------|--------------------------|-------|
| Picture Hall Eris    | Faversham Institute | 5 Guineas  | April 29.                | ii.   |
| New Market Buildings | Swansea Corporation | 50 Guineas | June 8.]                 | ii.   |

## CONTRACTS.

| Nature of Work, or Materials.             | By whom Required.                    | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------------|--------------------------------------|-----------------------------------|--------------------------|-------|
| Alterations and other Works, Ravenscourt  | Hammersmith Public Lit. rates Commr. | E. F. Roberts                     | April 9th                | ii.   |
| Painters' Work                            | St. Mary (Islington) Vestry          | Official                          | do.                      | ii.   |
| Booking Apparatus and Heating Dining Hall | St. Saviour's R.S.A.                 | J. Jarvis & Son                   | April 11th               | xiv.  |
| Guinness Premises, Croydon                | Rotherham R.S.A.                     | D. Jennings                       | April 13th               | xiv.  |
| Gravel and Gravel                         | Finchley Local Board                 | A. Broad                          | do.                      | xiv.  |
| Alteration to Chelsea Post Office         | Com. of H. M. Works                  | Official                          | April 15th               | ii.   |
| Water Main                                | Plumstead Rural Bd.                  | H. H. Church                      | do.                      | ii.   |
| Water Main                                | Tottenham Local Board                | J. E. Worth                       | do.                      | xiv.  |
| Outmaking and Paving Works                | Hythe Town Council                   | A. R. Steanings                   | April 17th               | ii.   |
| Outmaking and Paving Works                | Fulham Vestry                        | J. F. Norrington                  | do.                      | xiv.  |
| Outmaking and Paving Works                | Staines Lodge Estate                 | Lewis Solomon                     | April 18th               | xiv.  |
| Outmaking and Paving Works                | Devford Union                        | G. H. Tat                         | April 19th               | xiv.  |
| Outmaking and Paving Works                | West Department                      | Official                          | April 22nd               | ii.   |
| Outmaking and Paving Works                | West Ham Council                     | Lewis Angell                      | April 23rd               | ii.   |
| Outmaking and Paving Works                | Harrow-on-the-Hill, &c.              | Official                          | do.                      | xiv.  |
| Outmaking and Paving Works                | School                               | C. Bell                           | do.                      | xiv.  |
| Outmaking and Paving Works                | Swindon Local Board                  | J. Kincaid                        | April 24th               | xiv.  |
| Outmaking and Paving Works                | Stratford Dock Comg.                 | B. Binyon                         | April 25th               | xiv.  |
| Outmaking and Paving Works                | Haverhill Local Board                | T. W. Girdlestone                 | April 26th               | xiv.  |
| Outmaking and Paving Works                | John Corbett, Esq. M.P.              | J. Kemp                           | Not stated.              | xiv.  |
| Outmaking and Paving Works                | School Bd. for London                | H. R. Nichols                     | do.                      | xiv.  |
| Outmaking and Paving Works                | School Bd. for London                | Official                          | do.                      | xiv.  |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.                    | By whom Advertised.   | Salary.        | Applications to be in. | Page.  |
|-------------------------------------------|-----------------------|----------------|------------------------|--------|
| Superior Officer to Superintend Building  | School Bd. for London | 300 <i>l</i> . | April 13th             | xviii. |
| Superior Officer for Repairs              | do.                   | 300 <i>l</i> . | do.                    | xviii. |
| Assistant in Measuring Surveyor's Depart. | do.                   | 150 <i>l</i> . | do.                    | xviii. |
| Foreman of Roads                          | Southampton Corp.     | 104 <i>l</i> . | April 16th             | xviii. |

DUBLIN.—For new gates and railings, and alterations to entrance, St. Werburgh's Church, Dublin. Mr. W. Kaye Barry, M.A., architect, Dublin.—  
Harry Sharpe, Dublin (accepted) ..... £214 10 0

EXMOUTH.—For the rebuilding of St. Margaret's Church. Messrs. Kerley & Ellis, architects, Exmouth:—  
Quicke, Lymeport ..... £293 0 0  
Perry, Exmouth ..... 870 0 0  
Bradbeer & Grace, Exmouth ..... 870 0 0  
Wm. Long, Exmouth ..... 789 5 0  
H. H. Hooper, Exmouth ..... 760 0 0  
Ponsford, Exmouth ..... 675 0 0  
Stokes, Exmouth ..... 670 0 0  
Hayman, Exmouth ..... 619 0 0  
Henry Long, Exmouth (accepted) ..... 600 0 0  
Cooper & Son, Exmouth ..... 598 0 0

EXMOUTH (at Otterton).—For the rebuilding of the "King's Arms" Inn, for Mr. Geo. Vallance. Messrs. Kerley & Ellis, architects, Exmouth:—  
Bradbeer & Grace, Exmouth ..... £275 0 0  
H. H. Hooper, Exmouth ..... 740 0 0  
Turner & Skinner, Honiton ..... 630 0 0  
Carnell, Ottery St. Mary ..... 625 0 0  
Perry, Exmouth ..... 620 0 0  
Perkins & Taylor, Sidmouth ..... 607 17 0  
Bucknell, Sidmouth ..... 585 0 0  
Ponsford, Exmouth ..... 580 0 0  
Rogers & Co., Exmouth (accepted) ..... 503 10 0

EXMOUTH.—For the erection of the "Sailor's Rest," near the Docks. Messrs. Kerley & Ellis, architects, Exmouth and Sidmouth:—  
Rogers & Co., Exmouth ..... £500 0 0  
Perry, Exmouth ..... 490 0 0  
H. H. Hooper, Exmouth ..... 445 0 0  
Ponsford, Exmouth ..... 419 0 0  
Quicke, Lymeport ..... 400 0 0  
Cooper, Exmouth ..... 388 0 0  
Bradbeer & Grace, Exmouth ..... 381 0 0  
Stokes, Exmouth ..... 381 0 0  
Hayman, Exmouth ..... 379 0 0  
Perkins & Taylor, Sidmouth ..... 375 0 0

EXMOUTH.—For the erection of two houses in Bickton-street, Exmouth, for Mr. Henry Blackmore. Messrs. Kerley & Ellis, architects, Exmouth:—  
Tozer & Co. .... £453 15 0  
Stokes ..... 320 0 0  
Ponsford ..... 280 0 0

[All of Exmouth.]

GUNNERSBURY.—For the erection of semi-detached villas at Gunnersbury, for Mr. W. J. Rapkin. Mr. W. C. Styche, architect:—  
W. & J. Taylor ..... £1,516 0 0  
M. Colman & Co. .... 1,393 0 0  
J. Bloomer ..... 1,150 0 0  
C. Rogers (accepted) ..... 999 15 0  
H. Weller (too late) ..... 929 0 0

LONDON.—For the erection of the Samaritan Free Hospital, Marylebone-road. Messrs. Wm. G. Habershon & Paschauer, architects, 38, Bloomsbury-square:—  
Grogan, Stratford ..... £13,937 0 0  
Downs, Waltham ..... 13,937 0 0  
Simpson, Paddington-street ..... 13,797 0 0  
Lawrence, City-road ..... 13,465 0 0  
D. C. Jones & Co., Gloucester ..... 13,424 0 0  
Gregory, Clapham Junction ..... 12,577 0 0  
Peters, Hoxham ..... 12,050 0 0  
Bentley, Waltham ..... 11,968 0 0

LONDON.—For new sliding glass partition, &c. for the Infants' Department of the Winchester-street School, Pentonville, for the School Board for London. Mr. T. J. Bailey, architect:—  
Whitehead & Co. .... £435 0 0  
F. Carter ..... 395 0 0

\* Recommended by the Works Committee for acceptance.

LONDON.—For enclosing, levelling, draining, and tarpaulining the additional land for the Hornet-row School, Hackney, for the School Board for London. Mr. T. J. Bailey, architect:—  
G. Moors ..... £178 16 0  
W. M. Dabbs ..... 175 0 0

\* Recommended by the Works Committee for acceptance.

LONDON.—For erecting additional water-closets, &c. for all departments of the Ben Jonson School, Harford-street, Stepney, for the School Board for London. Mr. T. J. Bailey, architect:—  
J. Edmunds ..... £270 0 0  
G. Barker ..... 680 0 0  
B. E. Read ..... 618 0 0  
O. Dawson ..... 578 0 0  
Simmonds Brothers ..... 563 0 0  
P. Carter ..... 507 0 0  
W. Hack ..... 498 0 0  
C. J. Sherwood\* ..... 429 0 0

\* Recommended by the Works Committee for acceptance.

LONDON.—For works in connection with the Jeoseph-road School, Heme Hill, for the School Board for London. Mr. T. J. Bailey, architect:—  
J. Jerry ..... £1,432 0 0  
Simmonds Bros. .... 1,214 0 0  
T. Lindfield ..... 1,198 0 0  
H. Walkley ..... 1,068 14 0  
Davis Bros. .... 863 0 0  
Caplen & Redgrave ..... 824 0 0  
J. Hume ..... 814 0 0  
King Bros. & Co. .... 785 0 0

\* Recommended by the Works Committee for acceptance.

LONDON.—For erecting new water-closets, &c. for the boys' and girls' departments of the Holden-street School, Buttes, for the School Board for London. Mr. T. J. Bailey, architect:—  
Davis Bros. .... £523 10 0  
H. Walkley ..... 487 0 0  
Simmonds Bros. .... 447 0 0  
King Bros. & Co. .... 439 0 0  
Whitehead & Co.\* ..... 355 0 0

\* Recommended by the Works Committee for acceptance.

LONDON.—For alterations and repairs at 39, Green-street, Park-lane, for Mr. W. J. Winstanley. Mr. Herbert Winstanley, architect, 10, Basinghall-street, E.C.:—  
George Foxley, King-street, Regent-street (accepted) ..... £150 0 0

LONDON.—For painting and decorating at 23, Charles-street, Berkeley-square, for Lord Granville Gordon.—  
George Foxley, King-street, Regent-street (accepted) ..... £210 0 0

LONDON.—For making good damage caused by fire at 10, Great Marlborough-street, W., for the Westminster Fire Office. Mr. Thos. E. Mundy, surveyor, 13, Buckingham-street, Adelphi:—  
Robert Perkins ..... £187 0 0  
George Foxley ..... 165 0 0  
Clements ..... 147 0 0

LONDON.—For alterations, general repairs, &c. to the Mission Hall, Harvey-street, Hoxton, for the managers of Park Church, Highbury:—  
Hibbs ..... £213 0 0  
Bennett ..... 201 2 0  
H. M. Dove (accepted) ..... 193 0 0

LONDON.—For removing and re-building the "Prince Alfred" public-house, Wood-street, Westminster, for Messrs. Wood & Co. Mr. J. Calder, architect. Quantities supplied:—  
Grant ..... £1,346 0 0  
Holliday & Greenwood ..... 1,377 0 0  
Falkner ..... 1,654 0 0  
Howard ..... 1,200 0 0  
Stephens ..... 1,060 0 0  
King & Son ..... 1,048 0 0  
Grafton ..... 850 0 0

LONDON.—For general repairs and decorations at 80, Holland-road, Kensington, for Mr. S. H. Byrne. Mr. J. T. Passmore, Aven Lodge, West Kensington, surveyor:—  
Squires & Potter ..... £284 0 0  
Jolliffe ..... 239 0 0  
Swan ..... 238 0 0  
Lindfield (accepted) ..... 205 0 0

LONDON.—For the erection of ten houses in Menotti-street and Cheshire-street, Bethnal Green. Messrs. J. & W. Stone, architects:—  
Balsam Bros. (accepted) ..... £3,140 0 0  
[For full list see last week's Builder, p. 263.]

LONDON.—For fitting-up basement of Chesterfield House, Great Tower-street, E.C., as a toilet saloon. Mr. Delissa Joseph, architect, 17 and 18, Basinghall-street, E.C.:—  
Perry & Co. (accepted) ..... £1,482 0 0

LONDON.—For stone and ironwork at 8 and 9, Trumpington-street, E.C. Mr. Delissa Joseph, architect, 17 and 18, Basinghall-street, E.C.:—

Portland Stone.  
A. & W. Marchant ..... £295 0 0  
G. Herridge ..... 265 0 0  
F. J. Barnes (accepted) ..... 215 0 0

Contractual Ironwork.  
Messures Bros. & Co. .... £166 12 0  
Shaw & Co. .... 162 0 0  
Rowson, Draw, & Co. (accepted) ..... 130 0 0

LONDON.—For shops and stabling at Roselynn-hill, Hampstead, N.W. Mr. Edward Monson, jun., architect, The Vale, Acton, W.:—  
Shops. Stabling. Total.  
Clayton & Co. .... £6,756 ..... £2,144 ..... £8,899  
E. Porter ..... 6,789 ..... 1,917 ..... 8,696  
Brown & Sweetland ..... 6,700 ..... 1,380 ..... 8,080  
Penny & Co. .... 6,930 ..... 1,890 ..... 7,610  
E. Hughes ..... 6,837 ..... 1,692 ..... 7,579  
J. J. Thompson ..... — ..... 1,375 ..... —  
E. Kerrison ..... — ..... 1,375 ..... —  
G. Lyford (accepted) ..... 6,680 ..... 1,340 ..... 7,900

LONDON.—For sundry repairs, painting, &c., at No. 34, Great Tower-street, for Messrs. Dent, Urwick, & Yeatman. Mr. J. D. Mathews, architect, 11, Dogwater-hill, E.C.:—  
Williams & Son, Barnsbury ..... £833 0 0  
Ashby & Horner, Aldgate ..... 843 0 0  
Jerrard, Lewisham ..... 793 0 0  
B. E. Nightingale, Albert Embankment ..... 785 0 0  
Ramsay, Walbrook ..... 736 0 0  
Thos. Wontner Smith & Son, Isledon Works, Essex-road, N. .... 668 0 0  
Lordon & Son, Upper Tooting ..... 637 0 0

LONDON.—For new shop-fronts at Nos. 74 and 75, Upper-street, Islington, for Messrs. T. Fenwick Evans & Co. Mr. Eugene C. Beaumont, architect, 43, Imperial-buildings, Ludgate-circus, E.C.:—

If plain bars to fronts.  
Draw & Cadman ..... £363 0 0  
T. Andrews ..... 344 0 0  
F. Sage & Co. .... 329 10 0  
Thos. Wontner Smith & Son\* ..... 315 0 0  
\* Accepted.

LONDON.—For repairs to coach-house and stables at Dulwich Wood House, Upper Sydenham, for Mr. Charles Bennett. Mr. W. F. Potter, architect:—

F. Walker & Sons, Poplar ..... £125 0 0  
Mid-Kent Building and Contracting Works, "Limited," Beckenham ..... 91 0 0  
F. Davies, Peckham-rye ..... 89 0 0  
Holliday & Greenwood, Erixton\* ..... 83 10 0  
W. Wythe, Dalston ..... 82 0 0  
\* Accepted.

LONDON.—For proposed alterations and additions to house in Holland-park-terrace, Notting Hill Gate, for Lieut. G. Mansfield Smith-Cumming. Messrs. Higgs & Rankin, architects, 44, Bedford-row, W.C.:

|                 |            |
|-----------------|------------|
| J. M. Mosey     | £1,200 0 0 |
| H. L. Holloway  | 1,135 0 0  |
| Kilby & Gayford | 1,134 0 0  |

LONDON.—For alterations and new shop-front to No. 40, Aldersgate-street, E.C., for Messrs. Herring & Co. Mr. Arthur Lett, architect:—

|                       |          |
|-----------------------|----------|
| Patman & Fotheringham | £493 0 0 |
| H. & E. Lea           | 469 10 0 |
| Drew & Cadman         | 469 10 0 |
| W. Palmer             | 468 10 0 |

LONDON.—For alterations and additions to Melville House, Overhill-road, Dulwich, S.E. Mr. J. M. Cable, architect:—

|                              |          |
|------------------------------|----------|
| Young & Lonsdale, Herts-hill | £340 0 0 |
|------------------------------|----------|

\* Accepted.

MANCHESTER.—For erecting coach-house and stables for Mr. J. H. L. Sackham. Mr. J. D. Harker, architect, 78, King-street, Manchester:—

|                        |           |
|------------------------|-----------|
| Edward Wood (accepted) | £256 17 6 |
|------------------------|-----------|

MERRION (Co. Dublin, Ireland).—For additions to St. John's House of Rest, Merrion, co. Dublin. Mr. W. Kaye Parry, M.A., architect, Dublin. Quantities by Mr. Henry McConnell, Dublin:—

|                            |           |
|----------------------------|-----------|
| Stephen Adams, Dublin      | £751 14 9 |
| T. Wardrop & Sons, Dublin  | 680 0 0   |
| C. Jolley, Blackrock       | 670 0 0   |
| T. Tighe & Sons, Dublin    | 673 0 0   |
| J. Pemberton & Son, Dublin | 637 0 0   |
| George J. Crumpton, Dublin | 627 17 3  |
| James P. Fife, Dublin      | 620 0 0   |

\* Accepted.

NEW MALDEN.—For additions to the Lecture Hall, &c., to the Congregational Church. Mr. W. H. Woodroffe, architect:—

|                  |           |
|------------------|-----------|
| Fagotter         | £421 13 0 |
| Lane             | 408 10 0  |
| Munday           | 392 10 0  |
| Adkins Bros.     | 375 0 0   |
| Aldridge & Son   | 355 0 0   |
| Earl             | 328 3 3   |
| Hollingsworth    | 322 0 0   |
| Young & Lonsdale | 308 0 0   |
| Mitchell         | 293 0 0   |
| Saunders         | 268 0 0   |

RICHMOND (Surrey).—For making a new road from Hill-street, to the River Thames, on the site of the Castle Hotel. Mr. Walter Brooke, Assoc.-M. Inst. C.E., Town Surveyor:—

|                                  | Silicated Spinkwell<br>stone steps, stone steps. |        |
|----------------------------------|--------------------------------------------------|--------|
| W. Neave & Son, Paddington       | £1,285                                           | £1,280 |
| R. Ballard, Child's Hill         | 1,230                                            | 1,275  |
| Lansdowne & Co., Richmond        | 1,210                                            | 1,240  |
| J. Bloomfield, Tottenham         | 1,191                                            | 1,168  |
| B. Cooke & Co., Battersea        | 1,063                                            | 1,075  |
| Nowell & Robson, Kensington      | 1,062                                            | 1,089  |
| G. Neal & Co., Wandsworth Common | 1,050                                            | 1,069  |
| A. Kellett, Ealing               | 1,010                                            | 1,013  |
| A. Atkins, Kingston-on-Thames    | 996                                              | 1,049  |
| J. G. Marshall, Brighton         | 980                                              | 982    |
| Paul & Son, Bromley              | 975                                              | 1,049  |
| W. Canliffe, Dorking             | 936                                              | 937    |
| G. Aldred, Strand-on-the-Green   | 897                                              | 847    |
| T. Adams, Kingland               | 818                                              | 859    |
| Surveyor's Estimates             | 872                                              | 808    |
| * Accepted Tender.               | £44 10s.                                         |        |

SHEPTON MALLEY (Somerset).—For erecting new copper-houses and other works, for the Anglo-Bavarian Brewery Company. Mr. W. H. Clark, architect, Bristol. Quantities by Mr. W. L. Bernard, 39, Broad-street, Bristol:—

|                              | Copper-house, | Raising stack. |
|------------------------------|---------------|----------------|
| Joseph Emery, Shepton Mallet | £8,078 7 8    | £114 6 0       |
| Wm. Cowlin & Son, Bristol    | 5,562 0 0     | 100 0 0        |
| Jacob Long, Bath             | 5,500 0 0     | 70 0 0         |
| Stephens & Rawson, Bristol   | 5,599 0 0     | 100 0 0        |
| R. Walters, Bristol          | 5,595 0 0     | 175 0 0        |
| J. Wilkins & Son, Bristol    | 5,444 0 0     | 125 0 0        |
| R. Wilkins & Son, Bristol    | 5,189 0 0     | 70 0 0         |

\* Accepted.

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|                                            |            |
|--------------------------------------------|------------|
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| S. Whitcomb, Petworth                      | 535 10 0   |
| R. Chamberlain, Petworth                   | 757 17 0   |
| J. Wadley & Sons, Five Oaks, Billingshurst | 748 0 0    |
| J. M. Marshall, Petworth (accepted)        | 550 0 0    |

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|                           |          |
|---------------------------|----------|
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| Clifford & Gough          | 549 10 0 |
| T. Turner, Limited        | 497 0 0  |
| H. M. Dove (accepted)     | 495 0 0  |

[All of Watford.]

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|                             |            |
|-----------------------------|------------|
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| Sir George Moyes, Dublin    | 975 0 0    |
| James Kiernan, Dublin       | 900 0 0    |
| Henry Pemberton, Ballyhenry | 529 0 0    |

\* Accepted.

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# The Builder.

Vol. LVI. No. 2410.

SATURDAY, APRIL 12, 1896.

## ILLUSTRATIONS.

Illustrations of Wollaton Hall, Awarded Silver Medal of R.I.B.A., 1889: Measured and Drawn by Mr. Percy K. Allen:—

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| North and South Elevations.....                                                    | Double-Page Photo-Litho.        |
| East and West Elevations.....                                                      | Double-Page Photo-Litho.        |
| Ground Plan and Cross Section.....                                                 | Double-Page Photo-Litho.        |
| Detail Drawings.....                                                               | Four Single-Page Photo-Litho's. |
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### Venice and the Modern Builder.



IN the principal cities of Italy the problem as to the conflicting claims of ancient architectural remains and ancient historical associations on the one hand, and the requirements of modern building, appears to become every year a more difficult and a more pressing one. Demands for extensive clearance and rebuilding are no doubt put forward in many cases on a basis of really practical requirement, both in regard to sanitary improvement and to the necessity of providing for the carrying on of trades and manufactures which are of vital consequence to the prosperity of the city in regard to the part which it is to take in the modern life and commerce of the world. We have always declined to adopt, in regard to this question, the onesided and in a sense rather selfish views held by those whose interest in the subject is purely archaeological. Inhabitants of other countries have no valid right to claim that the modern population of an ancient and interesting city shall forego all improvements necessary to render the city a satisfactory and convenient place of residence for themselves and for their everyday avocations, in order to preserve it as an untouched relic of the past for the foreign visitor. On the other hand there appears to be reason to believe that some proportion of the demand for alteration and modernising of ancient cities in Italy proceeds from that portion of the population who are the least cultivated, the least alive to the archaeological interest of ancient buildings, and whose interest in pushing on alterations and improvements is purely a commercial one, quite as selfish in its own way as the conservative demands of the archaeological purist. We recently published some remarks on the subject of the extensive clearance contemplated and in fact actually commenced in Florence, from an Italian architect, who expressed his decisive opinion, on an examination of the whole scheme, that much of it was unnecessary and prompted mainly by building speculators who are not only careless about the interest of ancient buildings, but also quite indifferent as to any effort to render the modern erections architecturally worthy of their site and of the associations of

the place. It appears that Venice is being threatened almost to the same extent, and with too much of the same spirit of indifference to anything but purely commercial considerations.

The changes that have taken place in the political condition of Italy have tended to promote this modern building movement, a subject which demands serious consideration, for Italy, especially as regards its principal cities, is a country which possesses an interest for students and lovers of art all over the world. The Italian cities present, no doubt, great difficulties to those who propose to introduce modern improvements. Every one of the principal cities possesses its own history, and has had its own school of art, which has commanded the respect and admiration of many generations of men. Hence the peculiar difficulty which arises, and which ought to be fairly faced, as to providing for the genuine and reasonable requirements of the modern populations without destroying the historic and artistic interest which has no doubt become, in a sense, the property of the whole intellectual world. And in regard to Venice, England may claim to have, perhaps, some special and peculiar interest. Our greatest poet has hallowed it with special associations; the name and the genius of Byron also are inseparably connected with the "Sea Cybele, fresh from Ocean"; our greatest landscape painter gave some of the best of his genius to re-creating on canvas the wonderful effects of light and colour to be found among its palace-bordered canals, and our most eloquent prose writer on art has consecrated sumptuous volumes to making better known to the western world the architectural glories of Venice, in pages teeming with enthusiasm, if sadly wanting in logical or accurate criticism. It was even said by an Italian writer in regard to the "restoration" of St. Mark's, that Ruskin, "more Venetian than the Venetians themselves" (much more, it would appear) had a claim to the citizenship of Venice, and would have been offered it if his great work on the city had been as well known to populace and municipality as it is to some of the more cultivated Venetian citizens. There is therefore really some claim for England to assume, among European nations, a special interest in Venice, a city only second to Athens and Rome in its historic interest, and perhaps even superior to Rome in artistic interest. The architectural remains of Rome have been the foundation of modern Classic architecture, and this

fact, coupled with their imposing scale and number, has given them an artistic interest beyond what their intrinsic architectural beauty might seem to justify. Venice, belonging to a period far nearer to our own, and in a very different state of preservation from Rome, forms, in combination with her sea and canals, a vision of poetic architectural beauty such as has existed, within historical knowledge, in no other place. It is this unique character of Venice which gives her such a value to the whole world, and makes one mourn over every threat of the defacement of such a vision. The building of a city European in culture and Oriental in rich and picturesque character, rising almost out of the sea, is a thing that has been done once and which in all probability will never be done again; and if it is threatened that our Venice is to be taken from us, it is reasonable that we should at all events ask, rather decisively, to be shown good cause for the robbery.

The modern builder has been for some time at work on Venice to a greater extent than many of our readers are aware of. Those who have visited Venice recently must have lamented the practical loss of the charming little island of S. Elena, the gem of the lagoon. Where S. Elena with its convent once stood, there now rises a vast edifice for the manufacture of railway carriages. This is to be regretted, but can hardly be blamed; railway carriages must be made, and we can hardly expect that Venice is to stand out of the modern railway system: some of those who want to visit the city for its beauty, and have little time to spare, would be the first to complain if they found they could not get there by rail; though it might perhaps be asked whether there was no site but S. Elena to found a carriage factory on. What is complained of rather, by those Venetians who have an interest in the beauty of their city, is the degree of apparently aimless and unnecessary pulling down and rebuilding which is now going on, the practical necessity and advantage of which is by no means always obvious. For several years past the demolition of houses and the filling up of canals has been going on, and the city is being deprived of its original character in order that it may be made to resemble other cities, mainly under the pretext of sanitary considerations and decency. If this were really all, opposition would be absurd; but when it is stated that "Venice will never rise again until carriages run through the streets," it is time to ask seriously whether this blas-



phemy (for one can hardly call it less) is really founded on any reasonable or logical ground. Imagine a municipality seriously proposing to take away from their town the one condition which above all others gives the place its unique interest and beauty. To put it even on the most practical and commercial grounds, what do the local authorities suppose brings to their city such a number of foreign visitors, whose presence must certainly be a distinct monetary gain to the town, except this very picturesque condition which they would remove? If this is what is wanted to provide trade, surely it would be better to build a "New Venice" on another site, and leave us the old one as a thing of beauty. The curious thing is that while all over the world the economy of water carriage is being more and more recognised, and canals are being made and proposed all over Europe in places where they were never made before, the one city which has the advantage of a natural waterway should be proposing to remove it, apparently from mere contradiction, and because it is there now, and "improvement" cannot be satisfied without change, and because other cities have carriage roads Venice must of necessity have them also. Yet this has been said, and it has even been suggested to fill up the Grand Canal for the purpose of converting it into a carriage road. A Venetian author wrote not long ago "We, who are not old, remember another Venice, picturesque, poetical, full of enchantment and mystery, which was destroyed, not for the sake of convenience or decorum, not through the requirements of the governing body or of new industries, but through the sheer desire to modernise everything." These are true words, which are borne out by facts, and will, it is to be feared, prove to be still more so should the project of the Office of Works of the Venetian Municipality be carried into effect.

It is not merely to afford pleasure to artists and poets that the best educated Italians desire (as we are assured they do) to see the characteristic features of Venice preserved as far as possible, but in order that their country may not be deprived of a city which has not its counterpart in the whole world, and whose beauty renders it worthy of being placed under a glass case, as Charles VIII. would have treated the Campanile at Florence. It is a painful truth, however, that there are people in Venice to whom the sight of the gondola gliding slowly over the lagoon is an offence and an anachronism; and the building project proposed by the Municipality, and accepted by the Provincial Assembly, is to be attributed mainly to the influence of these scornful of the past, these unconcerned observers of the most brilliant treasures of Venice. It is proposed by this revolutionary project to open no less than forty new streets in Venice, and all as wide as they would be made in any Continental town where there are carriages and horses to be provided for; and in the rage for demolition, the architectural interest of any building which might prove an obstacle to this ill-starred scheme goes for nothing. However, so the matter stands, and the Communal Council only replies to the protests and censure showered upon it:—

*Sic volo, sic jubeo, stat pro ratione voluntas.*

The official gazette of the kingdom has already published the decree establishing a Commission for putting legislation in action for modernising Venice. Architects, artists in general, and scholars are excluded from this Commission, a feature of the business which has given rise to severe censure; for it might at least be supposed that a commission to proceed to the work of demolition in an artistic city like Venice, would have thought it right to ask for the assistance and suggestions of artists.

For the present, however, the Municipality does not possess the requisite funds for carrying out its project, though it may be partially accomplished here and there, where any apparently urgent necessity for demolition and rebuilding may favour it. This is

already the case as regards the decree for the erection of a new post-office, which was required owing to the unsuitableness of the present one. But when the new streets shall have been opened, what class of buildings will be erected beside them?

It is probable that they will not differ much from those already put up in the new streets Vittorio Emanuele, 22 Marzo, and 2 Aprile: for Venice has not shown so far any very high aims in her new building, which seems to follow too closely the general spirit of modern town building which owes its inspiration rather to speculative ideas than to art. And if mere speculative and commercial architecture is to be decreed in other towns, how much more in a city like Venice, an ancient centre of art, and which possesses a whole series of magnificent monuments that have attracted students from all parts of Europe to admire and study them? There is little doubt, however, that the proposed new Venetian streets,—should they ever be made,—will be lined with common, vulgar houses, faced with stucco, which will contrast sadly indeed with the genial places which embellish and gladden the Grand Canal, the smaller canals and "campi." It would even be something if the outlines were pleasing, but the breath of the nineteenth century has passed over Venice, and the feeling for the picturesque, whether in detail, colour, or general outline, seems dead. Some of the works of restoration, or remodelling, executed recently are melancholy indications of this. For instance, a wing with a mass of yellow wall, and with heavy cornices and corbels of white stucco, has been added to the brown marble Tiepolo Palace, on the Grand Canal, and the hand of the whitewasher has passed over the pointed arches of the Sagrado Palace. Not so many years ago, there stood, at the corner facing the canal to the right of the Carmine church, an interesting little palace of very elegant proportions, assigned by tradition as the residence of Othello. This interesting monument was considered to require "thorough restoration, and, alas! received it. The beautiful sculptured marbles all passed away, perhaps into the possession of the master mason, and in place of the pointed arches, columns, the scutcheons and shields, of the original, he constructed a little common country-house, devoid of artistic character, and well adapted for a wine store, for which purpose, in fact, it was let.


It has been said that those who love Venice least are the Venetians, but this is, we believe, a libel on many of the citizens, for if in Venice the threatened opening of the forty new streets has been approved, if certain really preposterous restorations and other deplorable mistakes have been tolerated, there are on the other hand a good many who oppose this turn which the building question has taken in Venice to the detriment of all that Venice has most sacred and splendid to preserve; and who are keeping up a persistent agitation against it which will no doubt have its effect and succeed in averting, at least, some of the excesses into which, were it not for the control exercised by others, modern building speculators would lead the Board of Public Works of the once proud and noble city of the Doges.

The Venetians who support these proposed building innovations, those who only consider the artistic beauties and peculiarities of Venice as so many obstacles to the easier development of industry in the city, have been aptly reminded that those who built Venice, as it now stands, were men who had the greatest respect for and made the most brilliant successes in trade and manufactures. Love of art never checked the development of industry, and the ancient Venetians are precisely those who afford the most conclusive proof of this fact. The prominent Doges and the Procurators of the old period had been great merchants, had travelled all over the world in their youth, and after having laboured hard in commerce they returned wealthy to Venice, and erected on the lagoon those magnificent palaces, which seem to have emanated from a poetic inspiration. Yet the men who produced these works were by no means mere

poets and dreamers; and recent researches into the political and social life of ancient Venice, of which a wealth of illustration exists in her copious State records, have shown conclusively that the popular idea of Medieval and Renaissance Venice as a society mainly taken up with art is an entire illusion; that in fact this extraordinary State, in the times when the works were executed which are still, in their faded splendour, among the artistic glories of the world, was marked by all its dealings by a shrewdness and worldly wisdom, a selfish acuteness in driving bargains and a hard-hearted persistency in exacting them, which have seldom been equalled in any trading community. It was by this craft they had their wealth, which they certainly turned to glorious purpose as far as artistic production was concerned.

But the archives of ancient Venice show conclusively that so far from mercantile and commercial enterprise and industry being incompatible with art, the two ends were pursued by the Venetians of that day with equal devotion and success. And therefore if the Venetians of the present day think that the artistic effort and enthusiasm, which made their city what it is in an architectural sense, is incompatible with commercial enterprise and success, the facts of history are dead against them. If they can be got to realise this, Venice will perhaps be saved from such further innovations as will permanently ruin her peculiar and picturesque beauty—from such innovations in fact as are not suggested by genuine sanitary requirements, and conditions of public and private security.

#### NOTES.

 The special meeting of the Institute of Architects on Monday night, the scheme for further developing the education and examination system in connexion with the Institute was affirmed by the meeting. The general resolution "that the Report and Scheme be approved and adopted" was passed with only one dissentient voice, and the following resolutions were passed unanimously:—

"Resolved that the Council be requested to prepare the detailed particulars and conditions necessary for developing and carrying out the Scheme; and also to communicate with the Allied Societies, in order to secure their effective co-operation in so developing and carrying it out."

These resolutions were passed after a debate of some length, to which some of the younger members contributed very ably. At the same meeting, previously to discussing the education scheme, the subject of the alliance of non-Metropolitan Societies with the Institute was considered, and the following resolution was unanimously passed:—

"That the Royal Institute of British Architects do admit to alliance therewith, under the provisions of Section XVII. of the By-laws (Nos. 77-81), the following non-Metropolitan Societies:—

- (1) The Sheffield Society of Architects and Surveyors;
- (2) The Leicester and Leicestershire Society of Architects;
- (3) The Manchester Society of Architects;
- (4) The Glasgow Institute of Architects;
- (5) The Northern Architectural Association;
- (6) The Bristol Society of Architects;
- (7) The Nottingham Architectural Society;
- (8) The Royal Institute of the Architects of Ireland;
- and (9) The Liverpool Architectural Society."

The meeting of the 8th has therefore done good work, and laid the foundation for a systematic co-operation of the Institute and the allied societies in the improvement of architectural education.

**T**HE London County Council, at its meeting on Tuesday last, had a large variety of important topics to discuss. We briefly report on another page the proceedings as to some of the items which are likely to prove of most interest to our readers. One of the most important matters before the Council is that of the water supply of London. The Council must proceed warily in this matter, for, whatever may be the outcome of their action,—whether the existing works be acquired from



the companies or not,—London is rapidly approaching the limits of the present sources of its water supply, which,—even as regards quality,—are not by any means all that could be desired. It is computed that in three years' time, *i.e.*, in 1892, the available sources of supply to some districts of the metropolis will become inadequate to meet the demands made upon them, supposing the population to increase in the same ratio as hitherto, and allowing for the existing rate of consumption of water per head.\* This is a serious outlook for London and its County Council, and the question of metropolitan water supply may prove to be as difficult of solution as the sewage problem, and may entail even greater expenditure. Another important question raised was that of the provision of a suitable meeting-place and offices for the Council. That question, as will be seen, has not yet been disposed of, but we were strongly inclined to agree with Mr. Edis and the three other members of the Council who signed the "minority report" of the committee charged with the consideration of the subject. To spend 10,000*l.* on alterations which in all probability will only serve a temporary purpose, and the carrying out of which will certainly render it necessary to require additional office accommodation elsewhere, will not be consistent either with true economy or with efficiency of administration. It appears to be quite clear that the new municipal authority for London, which is nearly three times as strong numerically as the late Board of Works, and which will require a much larger staff than the late board had, in consequence of the increase of duties which it has to fulfil, will sooner or later find it to be not only eminently desirable but absolutely necessary to have its meeting-place and its administrative and departmental offices in one building specially adapted to its purpose, free from the petty and the overcrowded and insanitary state of some of the rooms at Spring-gardens have found utterance through the lips of Dr. Longstaff, one of the members of the Council. The use of subways for gas, water, and hydraulic power mains, electric wires, &c.; the preservation of an open space in Bethnal-green (known as the "Bethnal-green Poor's Land"); the conditions of the sale or letting of the Council's surplus lands; and the proper treatment of the trees on Hampstead Heath and other open spaces under the control of the Council, were among the other items (not elsewhere mentioned by us) which engaged the attention of the Council on Tuesday.

THE newly-constituted Railway and Canal Commission Court disposed last week of an action brought by the Pelsall Coal and Iron Company against the London and North-Western Railway Company. The result cannot be regarded as satisfactory; for the President (Mr. Justice Wills) and Sir Frederick Peel disagreed upon several important points, the verdict, consequently, depending upon the opinion of the third Commissioner, who concurred in the judgment delivered by the President. The Pelsall company appear to consider themselves prejudiced in consequence of the railway company performing gratuitously for certain of their competitors various services which they do not perform for them. The Commissioners were asked to compel the railway company to give all details of the composition of certain rates as charged to them, and as charged to the other persons alluded to,—the latter being in the same district, though not at the same station. A knotty point was whether the applicants were "interested,"—within the meaning of the Act,—in rates charged to other persons. The Commissioners were unanimously of opinion that any person who makes out by proper evidence that the rates which he seeks to have dissected are really competitive rates with his own, is a person interested within

the meaning of the Section. But, unfortunately for the applicants, the evidence they had brought forward was not conclusive enough for Mr. Justice Wills. Intending litigants may take warning, for it is evident that it will not do to leave the smallest matter to be taken for granted. In this case the Pelsall Company omitted to state that their traffic was sent from Pelsall Station,—probably thinking it unnecessary,—and were guilty of several similar "sins of omission," thereby earning for themselves the following rebuke from the presiding Judge:—"The materials upon which our interference has been invoked are so exceedingly insufficient and unsatisfactory, and have been put together with such exceeding haste and carelessness, as to make it scarcely respectful even to the Court to come before it in such a fashion." Sir Fredk. Peel, on the other hand, while admitting that the affidavits were far from being unexceptionable, was of opinion that they sufficiently supported the application. It was, however, dismissed,—though without costs. Mr. Justice Wills remarked that the applicants would have had to pay the costs had not the Railway Company resisted their application upon grounds that could not be supported. Thus, although the Pelsall Company get no redress for their grievances because they have not stated them explicitly enough, yet the Railway Company understood them sufficiently to resist the application, and have to pay for using bad arguments in support of their own position.

AN interesting and instructive judgment on the Public Health Act will be found in the recent judgment in the case of *The Queen v. Parly* in the current number of the Law Reports (Queen's Bench Division, vol. xxii., p. 620). The Local Board of a certain district carried out a system of drainage with the consent of the Local Government Board. Part of the system was without the district of this Local Board and within that of an adjoining rural sanitary authority. The sewage works in question produced a nuisance. The sanitary authority gave notice to the Local Board to abate the nuisance, and as this was not done, an order was made by two justices of the peace to the effect that the flow of sewage and the tanks, the causes of the nuisance, were to be discontinued and removed. In other words, the new system of drainage was to be put an end to. The Queen's Bench Division decided that the justices had not authority to make this order, because the ordinary sections of the Public Health Act did not apply to such a case as this. To decide otherwise would, in the opinion of the court, have had this extraordinary effect,—that two magistrates might suddenly render useless most elaborate and expensive sanitary schemes. The court also pointed out that there nevertheless existed a remedy for the state of things complained of; because persons individually injured could bring actions against the Local Board, and the complaining sanitary authority could obtain leave to file an information in the name of the Attorney General, which, as the court rightly observed, would be "a much more appropriate remedy than summary proceedings before the justices at the mere will of a Local Board, with whom, oftentimes, the mere fact of the intrusion of strangers into their district is a sore point." This decision will, therefore, clearly prevent sanitary schemes from being hastily condemned by local boards or ignorant justices.

IN a letter in the *Times* of Wednesday Mr. T. G. Jackson makes a well-written and forcible protest, especially for the benefit of the County Council, against the idea of removing the Church of St. Mary-le-Strand. We have already drawn attention to the significant measurements of the Strand at various points, brought forward by the Hon. Secretary of the Institute of Architects, and which prove that the portion of the roadway by St. Mary's Church is really, taking the average of the whole street, one of the wider and not one of the narrower portions. Mr. Jackson's main suggestion is that which we have repeatedly

made for some years past (though the *Daily Telegraph* has only just discovered the fact) that a new roadway should be formed to the north of the church and on the site of the Holywell-street houses. We may quote what Mr. Jackson says further on as to the architectural importance of the Strand churches:—

"Few streets in Europe can show anything to equal the series of Gibbs's three stately steeples of St. Martin's, St. Mary's, and St. Clement's; for the last is his too, though the body of the church is Sir Christopher's. They are notable examples of a class of buildings which vindicate the originality of English architects, and show how they worked out the Classic Renaissance in their own way. There is nothing like them in any other country; here only did the neo-Classic style attempt the steeple, and challenge comparison with Gothic on its own ground, not without success. . . .

The majority of the new Council are presumably not so indifferent to the architectural beauty of the great city over which they preside as to be guided either by the brute Philistinism of the utilitarian or the narrow bigotry of the Gothic purist. We have a right to expect better things of them, and to demand that they will be as careful for the preservation of the ancient architectural beauties of London as for its improvement in other respects. It would, indeed, be a bad beginning to their régime if it were signalised by an act of such little vandalism as this threatened destruction of one of the most picturesque architectural compositions in Europe."

It will be seen by our report of the proceedings at the County Council on Tuesday last that the question has been referred to the Improvement Committee and to the Housing of the Working Classes Committee,—it being suggested, we believe, by some of the Councillors, that by clearing away some part of the buildings to the north of the Church, not only may an important street improvement be effected, but sites may be found for artisans' dwellings of a healthy character. We are glad to see that it is an instruction from the Council to the Committees to have regard "to the desirability of preserving the Church, if practicable." We think we have shown that it is practicable.

WE perceive from an article in the *South London Press* of the 6th inst. that what is known as "the Brockwell Park scheme" is again coming to the front. We trust that the project for acquiring this fine park may be successfully carried through. Brockwell Park, which is situate adjoining Herne Hill Station, on the London, Chatham, & Dover Railway, is 78 acres in extent, and finely timbered. It is to be had for the sum of 122,000*l.*, or at the rate of 1,500*l.* per acre. It would be very desirable to preserve this fine breathing-space if possible; for the speculating builder, who has been for some years past gradually creeping up the rising ground between Brixton and Herne Hill, has now gained possession of part of that eminence, and, needless to say, his operations are proving anything but conducive to the preservation of the sylvan beauty of the neighbourhood. The same ubiquitous intruder is also invading the pretty hamlet of Dulwich, and although a park of 18½ acres is being provided there, the gift of the Governors of Dulwich College, it is about a mile away from Herne Hill, and therefore not so contiguous to the mass of bricks and mortar which now covers the once-pleasant fields of Brixton as the splendid park of 78 acres at Brockwell Hill. We are aware that there is a scheme, which has been before the public for some time, for the acquisition of what is known as "Raleigh Park," Brixton Hill (a short distance to the westward of Brockwell Park). Raleigh Park, it appears, is about 12 acres in extent, or little more than one-seventh the area of Brockwell Park. The price asked for Raleigh Park is 40,000*l.* Towards that sum the Charity Commissioners, the late Metropolitan Board of Works, and the Lambeth Vestry each promised to give 12,000*l.*, leaving 4,000*l.* still to be raised by the public. It is suggested by the *South London Press* that the promoters of this smaller park should divert their support to efforts to secure the larger, more important, and relatively much cheaper park in the immediate vicinity, the 36,000*l.*

\* See General Scott's Report in the "Seventeenth Annual Report of the Local Government Board, 1887-88," and the *Builder* for Dec. 1st, 1888, p. 394.



already conditionally promised being also (of course) diverted to the fund for the purchase of the larger and finer park. We wish we could feel assured of the success of the Brockwell Park project. Better "Raleigh Park" than no park, but much better than either, Brockwell Park. The difficulty would soon be solved if London's wealthy citizens were more widely blessed with the public spirit of the anonymous donor (we hear he is a builder: all honour to him!) who has just presented a park of 14 acres to South London, situate at Myatt's Fields, Camberwell, and which is to be opened this Saturday, the 13th inst., by the London County Council, as elsewhere mentioned by us.

**A**N advertisement in our columns of the 6th instant will remind our readers that the gardens and conservatory lately occupied by the Royal Horticultural Society are about to yield to the manifold changes which are being made in South Kensington. Founded in 1804, the Society removed, in 1821, from their small holdings in Kensington (Compton bridge) and Ealing to Chiswick, where they had acquired a lease, at 300*l.* per annum, of some thirty-three acres, since curtailed, of the market gardeners' grounds appertaining to the Duke of Devonshire's seat,—Chiswick House. There for many years were held the popular open-air fêtes. In 1859 the Society obtained a portion of the Gore House, Villars, Harrington, and Smith's charity estates, which had been bought by the Exhibition of 1851 Commissioners. Their new gardens were laid out in readiness for the International Exhibition of 1862. That exhibition was held in the building, mainly of brick, designed by the late Captain Fowke, R.E., conspicuous for its two vast glazed domes, the largest of their kind up to that date. Captain Fowke's structure gradually disappeared, and Mr. Alfred Waterhouse's Natural History Museum covers, in part, the site of the nave, which was 1,100 ft. long. The Museum was opened to the public on Easter Monday, 1881. The original plans for a red brick building, in the French Renaissance mode, were prepared by Captain Fowke, who died in 1865. The authorities finally approved Mr. Waterhouse's Romanesque designs six years later. Around these gardens was held a series of annual exhibitions in 1871-4, followed by another series that began with the "Fisheries" of 1883. Here in 1868 was shown the late Sir Samuel Meyrick's collection of weapons and armour, and here for a while, in galleries most ill-adapted for their security, the pictures of the National Portrait Collection were displayed.

**A** SUBSCRIPTION is being raised to defray the cost of restoring a notable monument in the Church of St. Botolph by Aldgate. It bears a sculptured marble recumbent figure, clad in a winding-sheet, lying beneath an entablature supported by columns. Pennant writes "the figure is at present deformed by fresh painting, and the inscription rendered illegible." The inscription, as recorded by Hatton (1708) and the late George Godwin (1839) runs on this wise:—"Here lyeth Thomas, Lord Darcy, of the North, and sometime of the Order of the Garter; Sir Nicholas Carew, Knight of the Garter; Lady Elizabeth Carew, daughter to Sir Francis Brian; and Sir Arthur Darcy, younger son to the said Lord Darcy; and Lady Mary, his dear wife, daughter of Sir Nicholas Carew, who had ten sons and five daughters"; the Darcy and Carew arms are emblazoned. Lord Darcy was descended from Sir Humphrey Dacre, of Gillesland, elevated Lord Dacre of the North by Edward IV., who acted as arbitrator in the memorable contest between Sir Richard Fiennes, husband to Joane, granddaughter and heir of Thomas, sixth Baron Dacre, and his wife's uncle, Sir Humphrey, a younger son of Lord Thomas. Thomas, Lord Darcy, was beheaded on Tower-hill in 1537, for his share in Aske's rebellion, known as the "Pilgrimage of Grace." Sir Nicholas Carew, of Beddington Hall, between Croydon and Carshalton, Surrey, Master of Horse to the

king, met with a like fate on March 3, 1538-9, for having taken part in certain revolutionary proceedings which followed upon the publication of Cardinal de la Pole's treatise, "The Unity of the Church." All the members of that house were charged with high treason; many of them were executed; and the Cardinal's mother, Margaret, the venerable Countess of Salisbury, was attainted, and ultimately beheaded on the Tower-green, May 27, 1541. In St. Botolph's was the Darcy family vault. The monument we speak of stood in the chancel of the old church, as rebuilt by the canons of Holy Trinity Priory, hard by. It has latterly been put within a porch of the new church, built 1741-5, after the designs of George Dance the elder, at a cost of 5,500*l.* During some current repairs the monument is deposited, for safety, with Messrs. J. Daymond & Son, architectural sculptors. The memorial alabaster tablet to Sir Edward Darcy, Knight (1612), is also mentioned by Hatton, and as being, together with the effigy, in the former chancel. At Beddington, once famed for its beautiful garden and fine orange-trees, Sir Francis Carew entertained in royal state Queen Elizabeth, in 1599 and 1600, and King James I., in 1603. The manor-house, which passed to the Throckmortons (who assumed the name of Carew) on Sir Francis's death in 1611, was almost wholly rebuilt in 1709. Walpole, writing to Lady Ossory in July, 1779, describes his visit here, and speaks of "the brave old hall with a pendent roof, copied by Wolsey at Hampton Court." This hall was preserved when, twenty-five years since, the Female Orphan Asylum was established here. The house, with twenty acres, was bought for 14,500*l.* of the Carew trustees. Sir Walter Raleigh gave the orange-seeds to his wife's uncle, Sir Francis, an enthusiastic horticulturist. The trees perished in the hard frosts of 1739-40.

**THE** West Highland Railway, the Bill for which in a modified form has just received the sanction of a House of Lords Committee, is likely to bring the banks of Loch Lomond into greater notice for the purposes of residence by the Glasgow citizens than has hitherto been the case. The railway in question is to commence at Helensburgh, and to end at Fort William. The first part of it will pass along the western bank of Loch Lomond, which, from one end to the other, will thus be quickly accessible from Glasgow. The effect of the railway further north is not likely to be very noticeable, though, of course, it will render some parts more accessible. It is also somewhat doubtful whether the railway will have a remunerative goods traffic, having regard to the facilities for water carriage from Fort William to Greenock. Should it be constructed, as at present intended, to the former place, it will some day, in all probability, be prolonged to Inverness and to Strone Ferry. What Mr. Ruskin will say to this railway it is not difficult to imagine.

**I**N marked contrast with the practice of the late Metropolitan Board of Works is the course pursued by the London County Council with regard to the preparation of its agenda-paper and the presentation of its reports. Not only is the agenda-paper clearly arranged, but the reports of the various committees are printed *in extenso*, so that every member of the Council, and every representative of the Press, can readily follow the course of the business. At Spring-gardens, under the old régime, the practice was (until within the last few months) for the agenda-paper to be presented in the higgledy-piggledy and disjointed fashion which we described in a "Note" in the *Builder* for Sept. 1, 1888, p. 163. Down to the very last meeting of the late Board, the reports of committees were never in print. The practice under the Board's rule of London was for these reports (often of very great moment) to be presented in writing only; it was, consequently, necessary for them to be read by the Clerk—an arrangement fraught with loss of time as well as loss of temper, for it was often quite impossible for

the members of the Board or the representatives of the Press to follow, or even to hear the words of long and tedious reports read in the low monotone of Mr. Wakefield's voice. It is true that sometimes there were a few "press copies" of these written reports available for the use of members, but they probably never exceeded six in number. But for some occult reason, not one copy of any report was vouchsafed to the Press gallery until after the whole report had been disposed of by the Board. When the discussion (sometimes lasting an hour or two on a single item out of several in a report) was concluded, then, and then only, two, or most three, copies of the report were sent for the use of the fifteen or sixteen reporters who might be present. What wonder that the late Board's proceedings were very meagrely reported?

**THE** House of Commons on Monday night had one of its annual skirmishes on the ventilation of the House, which, as usual, showed extraordinary diversities of opinion with very vague and shadowy information of the subject. Mr. McDonald, who opened the subject, complained that the House of Commons was "not ventilated on a systematic plan," one of the most unjustifiable statements we ever heard. Has Mr. McDonald taken the trouble to go over the system and ascertain how it is worked? The fact is the House of Commons, the room itself, is very well ventilated; there may be a deficiency of fresh air supply in the corridors and other accessory parts of the House; there is always a difficulty in keeping up sufficient ventilation in corridors and such accessory apartments when in use by a number of people, because a sufficient supply of air for the purpose is sure to lead to a complaint of draughts from a proportion of the persons concerned. It is impossible to get a large number of people to agree about ventilation; there is always a proportion of people who are mortally afraid of draughts. Those who want the present air-supply system stopped, and the windows opened instead would very likely be the first to complain when they found the inevitable cold draughts descending on their heads, and they would probably discover also that the House would be most difficult to speak in. Mr. Tatton Egerton remarks as to the importance of the source from which the air is drawn was more to the point. The sources are not immaculate though means are taken to purify the air in passing in. A better system would be to lead the air supply down from the top of the Victoria Tower, instead of driving the vitiated air up there. Such a system would however require the constant use of mechanical power, which is now only resorted to as a supplement to the pull of the upcast shaft, in case of any partial failure of the latter. Any radical alteration of the ventilation system of the House is ever made, we should recommend this method, and the employment of mechanical means entirely as more efficient and more easily regulated. In the meantime we may commend to the grumblers Mr. Labouchere's jaunty optimistic declaration that the ventilation is now "absolutely perfect," and that "nothing contributed so much to health and longevity as attendance at the debates." It seems to agree with Mr. Labouchere, at all events.

**The late Mr. M. H. Bloxam.**—It is proposed to take immediate steps towards establishing a memorial of the late Mr. M. H. Bloxam, F.S.A., at Rugby. Mr. Bloxam was a member of the school under Dr. Woolf (Dr. Arnold's predecessor), and he has bequeathed to it a valuable library and many rare objects of archaeological interest. Though living at Rugby all his life, he was also well known in archaeological circles throughout the country. All who are interested in the project are invited to a meeting at Rugby on Saturday, May 11, at 4 p.m., in the old Sixth-form School, when a committee will be formed to carry out the proposal. In the meantime all communications should be addressed to Mr. G. M. Seabrook, F.R.S., Rugby.—*Times*.



THE LATE METROPOLITAN BOARD  
OF WORKS:

## ITS LAST ANNUAL REPORT.

WE RECORDED, in a "Note" in our issue of the 3rd ult., the untimely decease of the Metropolitan Board of Works,—untimely, because although by effluxion of time and in accordance with the provisions of the Local Government of the Board would have expired on the 31st ult., it came to a summary end, self-provoked, in the 20th ult. By its persistence in proceeding at the last moment with the acceptance of a tender for the Blackwall Tunnel scheme (which, as we explained on the occasion referred to, would have committed its successors not only to a heavy outlay, but to the endorsement of an engineering scheme which they had had no means of considering), the Board precipitated its own dissolution by ten days. It was deemed necessary, in fact, to preemptorily snuff out the Board; and by one of those happy but all too rare instances of prevision in Acts of Parliament, it was actually found practicable to meet this necessity with the requisite promptitude. The Board's death therefore took place under circumstances which added to the obloquy by which, in consequence of the revelations made by Lord Herschell's Commission, its latter days had been overshadowed.

The "Report" of the Metropolitan Board of Works for 1888, recently issued, is before us, we write, and the present review of it will to some degree serve the purpose of an obituary notice of the late Board. That Board, although it was inherently defective in constitution, has no mean record of good work achieved, as is apparent from the Report.

Thirty-three years have elapsed, as the Report reminds us, since the Metropolitan Board of Works was called into existence by Sir Benjamin Hall's "Act for the Better Local Management of the Metropolis," usually known as "The Metropolis Local Management Act." Those who collect the state of London at that time, and who have witnessed the progress of improvement since the creation of the Board, will be the first to admit that, despite its innumerable failures, London owes much to that body. Under it it would be strange were it otherwise, considering the chaotic condition of things which obtained elsewhere than in the City in the days prior to the Board's existence, and taking into account the extensive powers with which it was vested. The Board was, in fact, a tentative approximation to a municipality for the metropolis, and supplied what had hitherto been wanting,—the means of "co-operation or conjoint action" in regard to needs which were common to the whole metropolis. It may be said, indeed, that the primary object of the creation of the Board was the establishment of a system of sewerage and main drainage,—the end of which was at that time most pressing. Owing to the compulsory abolition of cesspools a few years before (in 1848), the sewers, which were originally intended only for the reception of the surface drainage, became the channels for carrying into the river "all the excreta and waste-water of the population." Most of these wastes were discharged directly into the river, at low water only, so that for a great part of each day they were tide-locked, thus coming so many elongated cesspools, and as they only discharged their contents at low water, it is no wonder that in five or six years the state of the Thames as it passed through London was as bad as, and even worse than, the condition of the river at Woolwich has been in late years owing to the immense volume of sewage discharged daily from the Barking and Crossness Outfalls. The main drainage system of London, carried out by the Board in the first years of its existence, is in its way as monumental a work as the construction of the river bankments, and (with certain supplementary works which have been found necessary from time to time, owing to the great increase of London, both in area and population) has cost upwards of 5,000,000*l.*, whereas the cost of the Victoria, Albert, and Chelsea Embankments is stated to have been about 2,150,000*l.*

We have already referred to the crying

The Report may be described as being, in some degree, an obitography, for "a report of a special committee" appointed last year "to prepare a concise history of the Board" is given as a preface, explaining the fact that this concise history is combined with the Annual Report for 1888. The population in 1855 is given in the Report as 2,291,191; in 1881 it is put at 4,306,389. In 1855 the number of inhabited houses is stated to have been 407,747; for 1888 the figures are 649,283.

necessity that exists for the purification of the river in the neighbourhood of the metropolitan sewage outfalls. The late Board, by their main drainage operations, have only succeeded, as far as the Thames is concerned, in transferring the *locals* of serious pollution a few miles lower down the river than they found it. They say, in their Report:—

"There is good reason to hope that when the works at Barking\* and Crossness are completed, and the whole of the London sewage is dealt with by precipitation, with the addition of a further purifying process when necessary in hot weather, the result will be that no further pollution will be caused by the discharge of the London sewage into the Thames."

We sincerely trust that the anticipations of the late Board may be realised, but we greatly fear that its successor, the London County Council, will yet have to grapple with the great sewage outfall difficulty. This is a problem which is likely to tax the resources of the new Engineer, whoever he may be, who is to succeed Sir Joseph Bazalgette.

A summary of the innumerable statutes conferring powers upon the late Board is given as the first appendix to the Report. These multifarious enactments provide for, among other things, the prevention of floods from the Thames, the formation of new streets, the control of buildings, the construction and maintenance of bridges, the demolition of houses in unhealthy areas under the Artisans' Dwellings Acts, the maintenance of the Fire Brigade, the supervision of the structural arrangements of theatres and music-halls, the sanctioning of tramways, control over the construction of railway bridges, the supervision (but to a very limited extent) of the gas and water supply, control over the sale and storage of explosives, petroleum, &c., the supervision of slaughter-houses and offensive businesses, also of dairies and cowsheds; the prevention of the spread of contagious diseases among cattle, horses, and dogs; "the supervision and control of what is known as 'baby farming'"; and "other matters of detail incidental to municipal government." All these powers are now transferred to the London County Council, who have also to discharge certain other duties hitherto performed by the magistrates of Middlesex, Surrey, Essex, and Kent.

We cannot attempt to summarise or digest the mass of statistics contained in the Report, but we may mention that the total cost of new streets and street improvements which were carried out by the late Board, or which were in progress at the time of its decease, amounted to no less a sum than £7,437,560. Moreover, grants to the amount of more than a million and a-half sterling were made to the City of London and various local authorities in aid of street improvements. Under the Artisans' Dwellings Acts, the late Board has carried out, altogether, twenty-two improvement schemes, including those now in progress. The areas to which the improvements apply contain altogether 59 acres. The total number of tenements in the unhealthy dwellings removed was 7,403, comprising 12,043 rooms, exclusive of those in "registered common lodging-houses." The blocks of improved dwellings already erected on the sites cleared by the demolition of the old "rookeries" are 263 in number accommodating 27,543 persons. "If to these figures," says the report, "are added those connected with the improved dwellings provided for persons displaced by the street improvements effected since 1872—viz., 61 blocks of dwellings, with room for 10,688 occupants—it will be seen that the Board's operations have resulted in providing improved dwellings for 38,231 persons of the labouring class." This result, however, has been somewhat dearly achieved, for we are informed that "the total amount expended by the Board in giving effect to the Artisans' and Labourers' Dwellings Improvements Acts exceeds a million and a-half sterling." This works out at about £40 per person provided for.

With regard to Thames crossings, the Report recalls the fact that when the Board came into existence there were only three free bridges across the Thames, viz., London, Blackfriars, and Westminster. At a somewhat later period, Southwark Bridge was added to this limited number, that structure having been acquired and the tolls abolished by the Corporation of the City of London. These four bridges, then, remained for many years the only free highways

for traffic between the two sides of the river. In 1877, the Board obtained an Act empowering it to free all the bridges over the Thames in London upon which tolls were levied. In October, 1878, the tolls on Waterloo Bridge were abolished, and during the next two years Lambeth, Vauxhall, Chelsea, Albert, Battersea, Wandsworth, Putney, and Hammersmith Bridges were opened free from toll by the acquisition of the structures at a cost for the whole series of 1,376,825*l.* Many of these bridges were at that time in such a condition that it was necessary at once to take measures to strengthen, and in some cases to reconstruct, them. The foundations of all the piers of Waterloo Bridge were deepened and secured, at a cost of 62,705*l.* The old wooden bridge at Putney was demolished, and a new and handsome granite bridge erected in its place at a cost of 250,000*l.*, or 300,000*l.*, including the cost of the new approaches.\* It was found necessary to underpin the southern pier of Hammersmith Bridge, and also to rebuild the superstructure,—and a very ugly affair it now is, quite unlike the old bridge,—at a cost of 82,177*l.* The old and imperfect timber bridge at Battersea, which had long been inadequate to the requirements of the traffic, has been pulled down, and a new cast-iron-arched structure, with stone piers, is now being erected, at a cost of 143,000*l.* This work is now in an advanced state of progress, and is likely to be completed in the course of this year.† Other schemes of providing for the cross-river traffic comprise the Woolwich Free Ferry (opened by Lord Rosebery on the 23rd ult.) and the Blackwall Tunnel scheme. This was the scheme the too-ardent prosecution of which led to the Board's summary extinction, ten days before the appointed day, under the circumstances already referred to. In 1887 the Board obtained power from Parliament to form a tunnel or subway under the river at Blackwall, with approaches on either side, so as to form a line of communication for foot passengers and vehicles between the East India Dock-road on the north and Woolwich on the south. It appears that, "after much deliberation," the Board, upon the advice of its Engineer (Sir Joseph Bazalgette, who has just retired from that office), came to the conclusion that the best course would be to make the tunnel in three parts, or, in other words, to make three separate tunnels,—two for vehicles going in opposite directions, and one for persons on foot. It was decided to proceed in the first instance with the tunnel for foot passengers, and with the formation of the approaches to the three tunnels. The Parliamentary estimate of the cost of the three tunnels and the approaches was 1,568,200*l.* Towards the end of last year, the Board invited tenders for the construction of the footway tunnel and the approaches, but only two tenders were submitted, viz., one from Messrs. S. Pearson & Son, who were willing to undertake this section of the work for 354,513*l.*, and one from Mr. W. Webster, amounting to 357,604*l.* Both these tenders being largely in excess of the Engineer's estimate, the matter was referred back to the Works Committee, with the result that early in this year tenders were again advertised for, when, as we stated three weeks ago, the lowest tender submitted was that of Messrs. Pearson, who offered to carry out the work for 318,840*l.* The acceptance of this tender (which was 38,840*l.* in excess of the Engineer's estimate) by the Board at what proved to be its final meeting, on the 15th ult., was in direct opposition to the desire of the Board's successors, the London County Council, who asked for the reference of the matter to themselves, as they would not only have to find the money for the project, but would be saddled with the responsibility of carrying out an engineering work of some difficulty under the supervision of an engineer other than Sir Joseph Bazalgette, who was then about to retire, as the Board knew. The hazardous nature of the work will be gathered from the statement, contained in the Engineer's Report, that "the river bed through which the tunnel will be made consists of gravel, which, of course, is very pervious to water . . . The depth from the bed of the river to the top of the tunnels will be generally from 9 ft. to 10 ft." It is proposed to construct the tunnel by the aid of pneumatic pressure, as employed in connexion with the construction of the foundations of the Forth Bridge.

There are many other branches of the late

\* Fully illustrated and described in the *Builder* for Jan. 3, 1886.

† For description of this bridge, see *Builder*, Aug. 11, 1888, p. 107.



Board's operations which we should be glad to refer to in detail did space permit. The Board did much to entitle it to gratitude by the acquisition and maintenance of parks, commons, and open spaces, and it will also be remembered for the increased efficiency of the Metropolitan Fire Brigade, which still falls short, however, of the actual strength in plant and *personnel* needed for the adequate protection of life and property from fire.

The Report concludes by referring to the scandals brought to light by the recent Royal Commission. On this head it says:—

"It has been a source of pain and sorrow to the Board that, at the close of thirty-three years' administration of the local affairs of London, which has been attended with at least some measure of success, and in the course of which the Board has carried out some of the greatest works of public utility of which any city can boast, its good name has during the last year of its existence been sullied by iniquitous proceedings, of which, though carried on in its midst, its members as a body were entirely without knowledge."

Two of the three appendices to the Board's Report consist of the reports of the Engineer (Sir Joseph Bazalgette) and the Superintending Architect (Mr. Thomas Blashill) on the work, large in amount and varied in character, executed in their respective departments during the year 1888. Both are business-like documents, and, in common with the whole Report, are well worth perusal by ratepayers and County Councillors. The Metropolitan Board of Works is dead, and the County Council reigns in its stead. If the new municipal authority achieve the success which its friends hope for, it will owe that success in no small degree to the fact that in many respects the late Board, defective as was its constitution, cleared the ground and made smooth some, at any rate, of the rough places in the management of the vast "province of houses" known as London.

#### WOLLATON HALL.

In connexion with the illustrations of Wollaton Hall, by Mr. Percy K. Allen, which we publish this week, we give the following abstract of the paper read by Mr. Allen before the Nottingham Architectural Society, on Thursday, March 28th:—

"Wollaton Hall is  $2\frac{1}{2}$  miles to the west of Nottingham Great Market-place, and stands on an eminence in the midst of a well-wooded park of 784 acres. The park is enclosed by a brick wall, supposed to have taken seven years in building, and there are four lodges, known as the Lenton Lodge (the one nearest Nottingham), the Beeston Lodge, the lodge at Wollaton Village, and one at Wollaton Gardens. The Lenton Lodge, which cost from 6,000*l.* to 7,000*l.*, was built between 1823 and 1825 from designs by Jeffrey Wyatville, whose real name was Wyatt, but was allowed by the Sovereign to use the affix 'ville,' to distinguish him from the numerous other Wyatts; and he is not the same Wyatt whom I mention later on, as he had very little to do with the Hall itself. When approaching the Hall from the Lenton Lodge, some tall Scotch pines will be noticed on the right. These mark the site of the ancient village of 'Sutton Passey's,' which is said to have been demolished when the Hall was built, as being in too close proximity to it. We next come to an avenue of lofty limes, half a mile in length, and on emerging from it we obtain the first good view of the Hall. One cannot fail to be struck with its dignity and admirable proportion from whatever point of view it is seen.

It was built by Sir Francis Willoughby, in the reign of Queen Elizabeth, as is seen from the inscription over the garden entrance, which is:—

EN · FRANCIS · WILLUGHBY · MILITIS ·  
· EDIS · RARA · ARTE · EXTRUCTAS · WILLUGH-  
· BEIS · P.B. · RELICTAS · INCHOATE · 1580 · ET ·  
· FINITE · 1588 ·

which, translated, freely, means,—'See this house of Francis Willoughby, knight, built with unusual skill, and left to Sir Percival and Lady Bridgett Willoughby. Begun in 1580, and finished in 1588.'

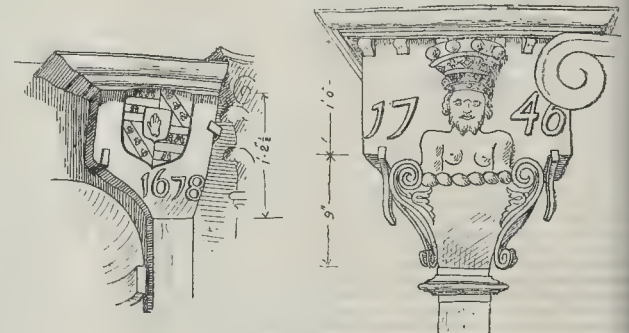
Sir Francis was born in 1547, and brought up with his sister Margaret, at Tilney, in Essex, by their cousins the Greys. He died in London, and was buried in St. Giles's Church Without, Cripplegate.

On arriving at the north front entrance, above which the Willoughby coats of arms may be seen, we pass through a vestibule into the large hall, which is the principal feature inside the

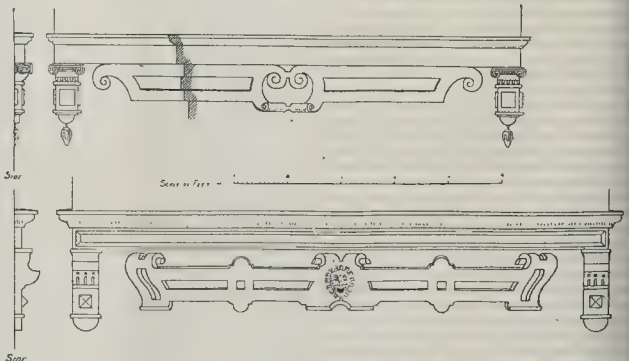
\* As a uucugiam.



Grotesques, Wollaton Hall.



Spout-heads, Wollaton Hall.

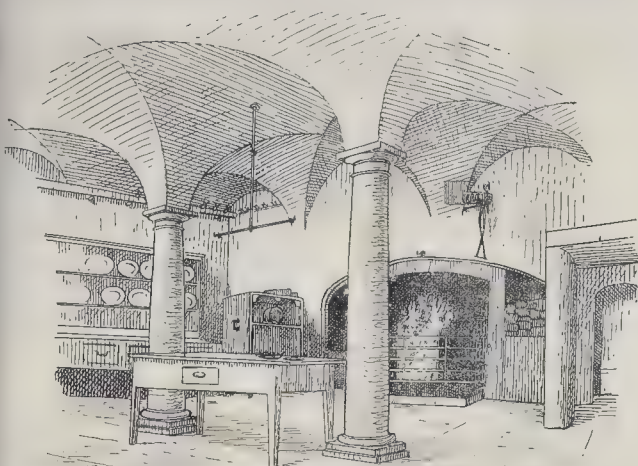


Window-sills, Wollaton Hall.

building, and measures 61 ft. 10½ in. in length, is supported by stone corbels, carved into 30 ft. 1½ in. in width, and 50 ft. 9½ in. in height. grotesque heads, the most curious of which are shown on the drawing. (See lithograph: "Red and screen of large hall.") Above the hammer-beams are columns painted to represent marble and pierced shields, on which are emblazoned different emblems of the Willoughby coat-of-arms.

A fine hammer-beam roof of oak, said to have been added by Wyatt, spans the hall. It is





The Kitchen, Wollaton Hall.

Wood panelling has, within recent times, taken the place of the original plaster ceiling.

Over the large hall is the prospect-room, so called from the splendid view to be obtained from it. It is 22 ft. 6 in. in height, and has a fine plaster cornice of triglyphs, with skulls and ornaments carved on the metopes, running round it.

There are two principal staircases, known respectively as the north and south. Originally there were handsome carved balusters and newels to them, but these are now removed, and a light iron framework, of simple design, has taken their place. The only original part of a staircase that is still standing is at the top of the back staircase, leading on to the lead flats.

No rooms of particular interest are to be found on the first-floor, the principal ones being the present ball-room (formerly the drawing-room), over the saloon, and the corresponding room on the north front, over the vestibule. This latter room is now partitioned off so as to form several small bedrooms, but it was originally the state dining-room, and before being put to its present use served as a billiard-room.

Descending to the basement, we find under the armoury a good-sized kitchen, with a semi-circular groined roof, supported by columns, and leading from it a second kitchen, underneath the dining-room, with larders beyond. A sketch of the kitchen is appended.

On the south side are the housekeeper's room, still-room, china-rooms, and store-rooms. The addition on the west front, made by Henry, sixth Lord Middleton, provided a steward's room,—now used as the housekeeper's room,—a servants' hall, and several necessary out-offices.

There are no rooms underneath the large hall.

Barrel-vaulted cellars, cut out of the solid rock, some portions being bricked in, extend for several hundred feet beyond the building.

Of the exterior little is needed in the way of explanation. Another stone was employed, and, considering the 300 years that have passed over the building, it has worn extremely well, the majority of the mouldings being still sharp and clean. The figures at the top of the pavilions and over the entrances are made of cement, and run with lead to keep them firm. An alteration was made about 1801 at the garden entrance, the present doorway leading from the saloon to the garden being originally a window like the others. This was done by Jeffrey Wyatt, who also bricked up the windows between the columns.

A plan by Wyatt, in the Estates Offices at Wollaton, shows that he proposed making some very extensive alterations to the building; but few of these have been carried out, the principal one being that just mentioned. Amongst his ideas not carried out, he proposed to cut away

the portion of the screen, in the Large Hall, between and including the doorways, thus extending the room to the passage wall, and to put another piece of screen at the far end, to correspond with what was left.

An erasure on another drawing, hanging in the Estates Office, by J. L. Johnson, and dated Dec. 8, 1785, shows that at some time there was an idea of putting a flying buttress up to the central portion from the parapet of the main building, as if to support it.

Many people doubt whether the central portion formed part of the original design, but attention should be called to the thickness of the wall at the east end of the large hall (it is about 7 ft. 6 in.), which, I think, shows that some important feature, needing good support, was to come above. It at any rate answers this purpose now, as it supports the two circular stone staircases leading on to the leads, and terminating in the turrets. There are no staircases at the other end of the hall. All the windows lighting the large hall, with the exception of those on the south front, are doubly glazed, to prevent their being blown in by the high winds.

Many of the windows in the main building are only for outside show, being boarded, or, in some cases, bricked up on the inside. This is shown on the side elevation of the garden entrance, where a section is shown through a bricked-up window on the first floor. In several cases a floor is built across the centre of the window, thus adding another story on the inside to that which is visible from without. This is seen on the side elevation of the south-east pavilion.

The four flues brought together over each pavilion are an addition, and are not shown upon old views of the Hall, but at what date they were added I have been unable to ascertain. The inconvenience in cleaning them may be imagined, two or three soot-doors having to be provided in each flue. They are built of brick, covered with cement, and iron stays are used to support them.

The passage underneath the steps on the south front was probably meant for and used as a skittle-alley.

Ornamenting the building are thirty-two busts, four of which have names attached, and represent Plato, Aristoteles, Virgilius, and Marcus Cato. Of the others, one is evidently meant to represent Charles I., which proves that some of them were added several years after the building was finished.

There are twenty full-length figures,—i.e., four on each pavilion, which are 4 ft. high, and two over each entrance, which are 3 ft. high. The two over the garden entrance represent the Monk and the Saracen who form part of the Willoughby coat of arms. Besides these there are 299 carved heads, &c., on the building.

The amount of lead used is enormous, the roofs of the Pavilions, as well as that of the

rest of the building, being lead flats, and all the principal cornices are covered with it. On the lead spout, heads, &c., which have the Saracen's head and the owl worked on them, neither time nor expense would seem to have been spared. Sketches of two of these spout-heads are given.

One of the best views of the Hall is obtained from the stables, which are on the west front, and were built by Sir Francis Willoughby, the first baronet. There is nothing of particular interest in them, except the carved pediment over the entrance, which represents the Monk and the Saracen holding the coat of arms, with numerous banners and weapons on either side.

The Hall was threatened by an attack of the Reform rioters in 1831. They entered the park by the Beeston lodge, which was at that time only a five-barred gate (the lodge being built two years later), but were repulsed by the Wollaton troop of the South Notts Yeomanry Cavalry. It was at this time that all the magnificent carved woodwork, which adorned the interior, was removed. PERCY K. ALLEN.

#### THE ELECTROLYTIC TREATMENT OF SEWAGE.

ELECTRICITY is invading almost every domain of domestic and municipal economy, and not the least curious and promising of its applications is that one which utilises its power of bringing about chemical decomposition, for the treatment of sewage.

Ever since the time when people began to congregate in large numbers on small areas, the question of sewage disposal has been one that has exercised and baffled the skill of chemists and sanitary engineers, and it has attracted the notice of economists and faddists without number. A satisfactory, widely applicable, and economical solution of the question has yet to be found. In the meantime, every attempt to scientifically deal with the matter off the beaten and somewhat discredited track which either involves the discharge of the sewage in the crude state into river or sea, or which merely attempts to mitigate its immediately obnoxious nature by chemical treatment, deserves attention, and, so far as results warrant, encouragement.

It was this feeling that probably induced a large party of representatives of the technical press to accept an invitation to view the experimental works, erected at his own expense, by Mr. William Webster, F.R.S., by permission of the late Metropolitan Board of Works, at the Southern Outfall Works, Crossness. The party met at Charing Cross on the morning of Wednesday, March 27, and proceeded together to the scene of operations.

For the benefit of readers who may not have perused Mr. Webster's paper read at the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, which is given *in extenso* in the *Builder* of July 21, 1888, we append the following explanation of the principle of the process:—When a sufficiently strong current of electricity is passed through a chemical compound either in solution or otherwise, and decomposition results, this is termed electrolysis. It will also be found that certain of the products of decomposition will be disengaged at one pole and the remainder at the other. In the patents of Mr. William Webster (Nos. 1,333, Jan. 27th, 1887; 15,760, Nov. 17th, 1887; 15,989, Nov. 19th, 1887), and also of Messrs. Hermite, Paterson, & Cooper (Nos. 15,384, and 15,385, November 10th, 1887), advantage is taken of this well-known fact. The chemical compound to be decomposed in the process under discussion is sewage, which contains organic matters suspended and in solution, as well as chlorides and other salts dissolved in water. On connecting this mixture with the poles of a sufficiently powerful source of electricity it is claimed by Mr. Webster that at the negative electrode, which may be of iron, nascent hydrogen, ammonia, &c., are set free by the current, and produce an alkaline reaction, while at the positive pole, which may be of iron, carbon, platinum, &c., nascent chlorine and oxygen are evolved, part of which unite to form, with the water, hypochlorous acid. By separating the negative from the positive pole with a porous partition or pot, the alkaline solution can be prevented from neutralising the acid and free chlorine evolved at the positive pole. Every one with an elementary knowledge of chemistry is acquainted with the extraordinary activity



Analyses of Experiments, 1888-9.  
PARTS PER 100,000.

| Appearance.                              | Colour.                              | Nitrogen as  |                    | Chlorine as Chloride | Oxygen required to oxidise organic matter. | Suspended Matters. |               |               |
|------------------------------------------|--------------------------------------|--------------|--------------------|----------------------|--------------------------------------------|--------------------|---------------|---------------|
|                                          |                                      | Free Ammonia | Albuminoid matter. |                      |                                            | Total.             | Mineral.      | Organic       |
| (A) Raw Sewage, very turbid & opalescent | Bad                                  | 3.57         | 0.6                | 14.61                | 4.03                                       | 14.52              | 5.95          | 8.57          |
| Effluent, clear                          | None                                 | 2.9          | 0.28               | 13.39                | 1.34                                       | 1.48               | 1.05          | 0.43          |
| (A) Raw Sewage, very turbid & opalescent | Very bad                             | 1.89         | 0.54               | 29.5                 | 2.57                                       | 15.43              | 7.43          | 8.00          |
| Effluent, clear                          | None                                 | 1.8          | 0.24               | 29.0                 | 1.21                                       | 2.20               | 1.91          | 0.29          |
| Average of 20 Analyses                   | Raw Sewage, very turbid & opalescent | Slight *     | 4.34               | 0.5                  | 21.64                                      | 1.24               | 33.35         | not estimated |
| Effluent, clear                          | None                                 | 3.22         | 0.2                | 18.62                | 0.52                                       | 1.56               | not estimated |               |

(A) Time of Settlement 1 hour, in open reservoirs.

of such elements as chlorine and oxygen when in the nascent state, that is to say, at the moment immediately after liberation before the (so to speak) connecting bonds of the respective atoms have found convenient points of attachment to other atoms. Oxygen in this state has its power of oxidising organic matter such as abounds in sewage enormously enhanced; chlorine, too, in this state rapidly decomposes water, uniting with hydrogen and setting free a fresh portion of nascent oxygen. The hypochlorous acid also produced in some quantity is partly engaged in attacking the iron of the positive pole to form ferrous hypochlorite, but partly also helps to modify and oxidise the sewage. It is claimed that by this means the whole of the dissolved organic matter can, if necessary, be oxidised to harmless products, while the suspended matter separates as a flocculent precipitate, which partly rises to the surface, being carried there by the liberated hydrogen. On the electrolytic solution being run into settling-tanks, after a period of from half an hour to two hours, the sludge will subside, and a clear and remarkably pure effluent run off. This, then, is the theory of the processes for the electrolytic treatment of sewage. How far they will be found efficient in practice, time and trial alone will decide.

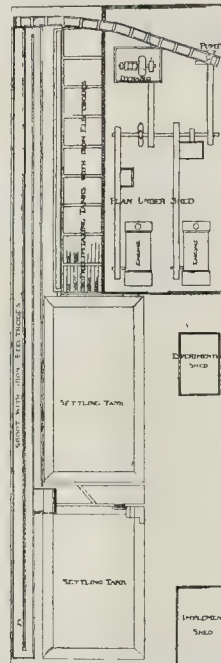
On arrival at the works, an inspection was first made of a model of the very ingenious automatic decanting-weir, patented by Mr. Houghton, and which is capable of wide application wherever liquids of different specific gravities are dealt with, or whenever, as in the case of the separation of solids from sewage, it is necessary to cause as little disturbance as possible of the contents of a settling-tank. The essential point consists of the arrangement, one above the other, of parallel flaps, which open or close by the action of a float, so that as the tank fills the submerged flaps automatically close and an upper one opens, a disturbance of the lower strata of the sediment-loaded fluid being thus avoided.

After viewing the magnificent pumping engines, which are capable of dealing with 152,000,000 gallons of sewage daily (the average amount pumped daily is something like 75,000,000 per diem), an adjournment was made for luncheon. In the course of a short speech made subsequently, Mr. Webster stated that the experimental works about to be viewed had cost him about 5,000*l.*, and that he felt confident of the ultimate and complete success of his process, even when worked on the largest scale. He further stated that he estimated the cost of the electrolytic treatment of the sewage at about 13*s.* per million gallons, but it subsequently transpired that this did not include interest on cost of plant, depreciation, or cost of dealing with the sludge.

As regards the process actually in operation at the Crossness Works, the following details were furnished by Mr. Webster. The crude sewage on being pumped up is allowed to flow into channels lined with iron. The accompanying plan will enable the arrangement to be better understood. Starting with the engine-shed, the engines, of an old type, made some twenty five years ago, are each 20-h.p. nominal.

\* We print the table as furnished to us, but we do not understand how it comes to pass that while the sewage in the two separate analyses is recorded as "bad" and "very bad" in regard to odour, the odour in the average of twenty analyses is recorded as "slight."

By an arrangement of the gear, one engine only is used at any one time both for pumping and for driving the dynamo. The dynamo is an Edison-Hopkinson, capable of developing an energy of 43-h.p. From the dynamo the leads run through resistance-frames, by means of which the amount of current can be regulated. These are then connected with the iron electrodes in both the precipitating tanks and the shoot. These electrodes or plates are made of common pig iron.



Plan of Experimental Works at Crossness for the Purification of Sewage by Electrolysis (Webster's Process).

The sewage is discharged into the shoot from the pump connected with the main sewer. The shoot is fitted with plates, as shown in the accompanying drawing. In travelling along the shoot every particle of sewage comes in contact with the plates or electrodes, and finally flows into the settling-tanks.

Experiments prove that with 27-h.p. it is possible to treat one million gallons of London sewage in twenty-four hours. About two grains of iron are consumed for each gallon of sewage treated. For a town furnishing ten million

gallons of sewage daily (corresponding to a population of 333,000, at thirty gallons per head) the consumption of iron would not exceed 484 tons per annum. The power required would be equivalent to 8-h.p. per 10,000 of population.

The effect of the current of electricity was certainly most remarkable, the turbid, crude sewage quickly separating into a clear liquid and a flocculent precipitate, the latter of which settled readily. The most important point about the whole process, perhaps, is that not only is the effluent clear, but that it is also free from putrescible matter. In fact, as one eminent chemist has remarked, if the figures given in the following analyses be correct, the sewage effluent from Webster's process is really purer than the Thames water itself.

We have no hesitation in saying that, so far as can be judged from the experiments seen at Crossness, the electrolytic process is at once the most scientific and the most promising of all the thousand-and-one schemes which have been propounded for solving a troublesome and pressing problem.

## Illustrations.

### MEASURED DRAWINGS OF WOLLATON HALL.

OUR lithograph illustrations this week are entirely occupied by measured drawings of Wollaton Hall, the work of Mr. Percy K. Allen, of Nottingham, and which deservedly obtained the Institute of Architects' Silver Medal for measured drawings from an existing building.

The illustrations include the four principal elevations, a plan and section, detail elevations of one of the angle pavilions and of the garden entrance, drawings and details of the roof and screen over the large hall, and a sheet of sections of mouldings, and other details.

Some notes on the building by Mr. Allen, and some further sketches, will be found in another column.

Our readers will agree with us that Mr. Allen has done a good service to all who are interested in English Renaissance architecture by producing, with such conscientious care and labour, these illustrations of a famous building.

### SUSSEX AND ITS ARCHITECTURE: THE ARCHITECTURAL ASSOCIATION.

THE twelfth meeting for the present session of this Association was held on the 5th inst., in the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

Mr. T. E. Pryce (Hon. Sec.) said that in connection with the protest against removing the Church of St. Mary-le-Strand, a letter thanking the Association for their action in the matter had been received from the vicar of the church. A communication had also been received from Lord Rosebery, stating that the protest would be laid in due course before the London County Council.

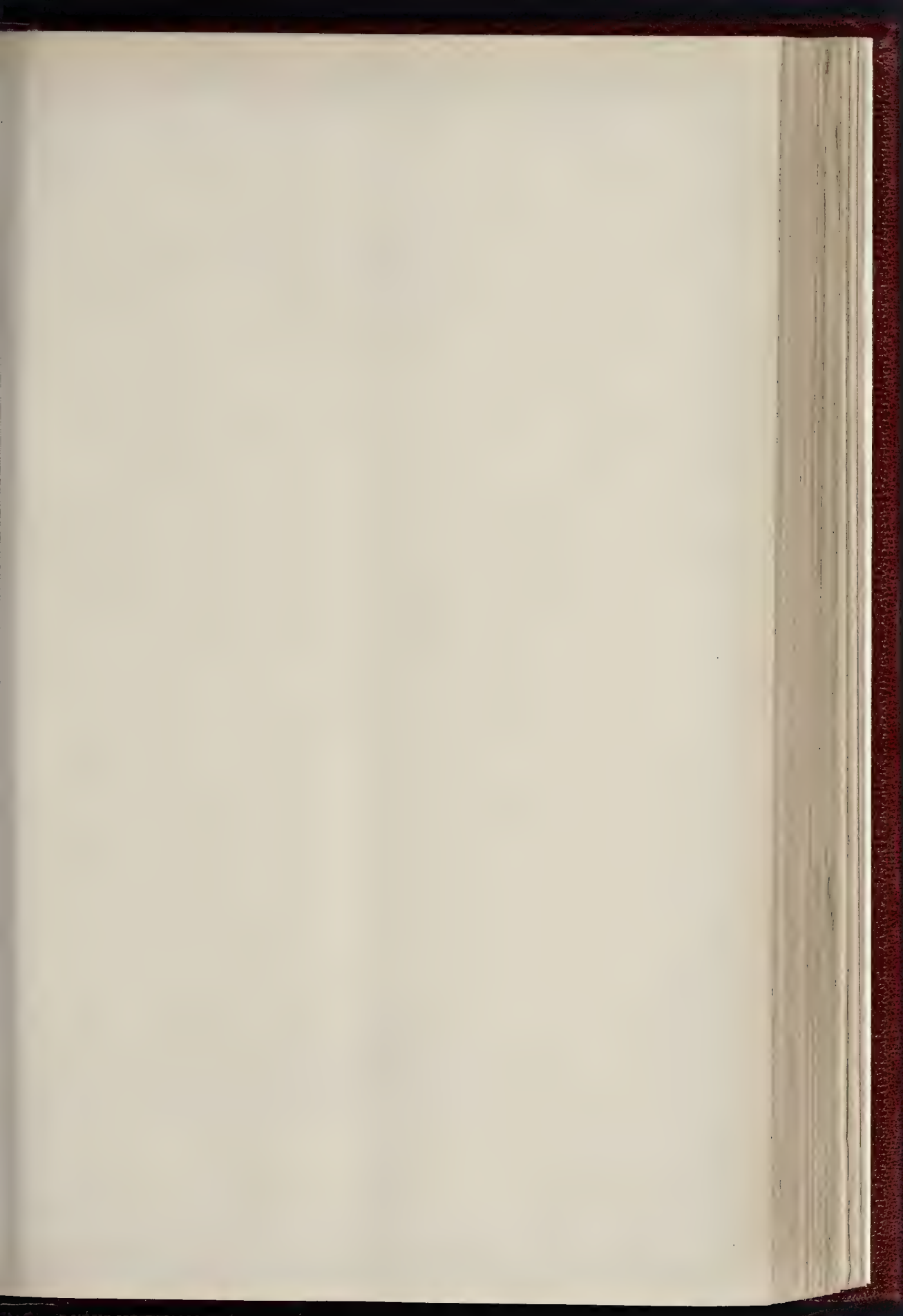
The following new members were elected, viz.:—Messrs. W. B. Price, F. G. Christmas, and G. E. Shephard.

A vote of thanks was passed to Mr. James Brooks for showing the members over the Church of St. Mary, Hornsey, on the occasion of the last visit.

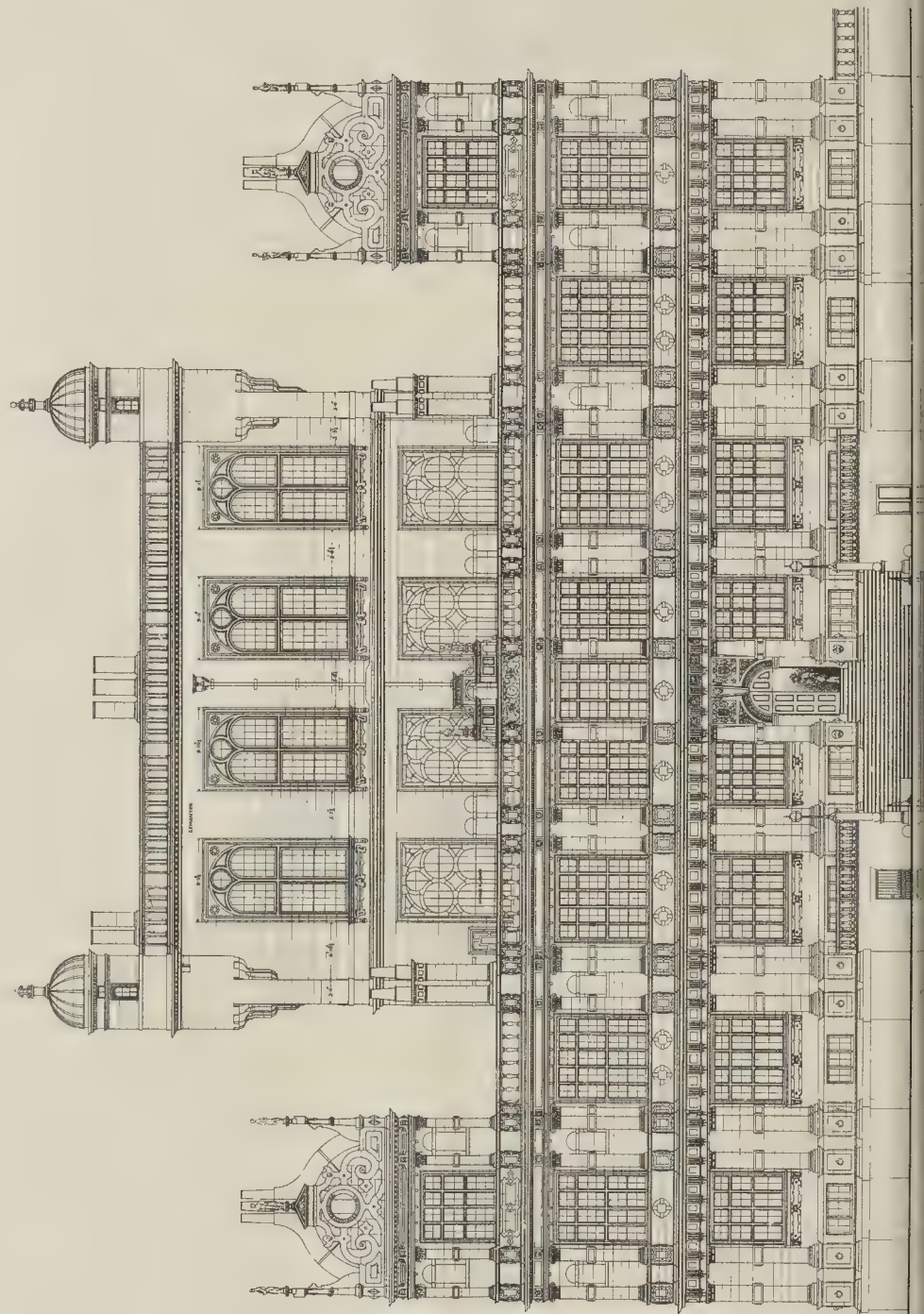
The preliminary or house-list of officers for the ensuing year was read, giving members the opportunity of handing in any nominations they may desire to make before the next meeting. The list nominated Mr. L. A. S. Stokes as President.

Mr. Lacy W. Ridge then gave an address on "Sussex and its Architecture." Sussex, Mr. Ridge said, was one of the kingdoms of the Heptarchy, and had remained a political organisation from that time. It was alone amongst the counties of England in having been a single bishopric by itself from the first foundation of the Church to the present time, and it was only within the last few years that any other county had come to occupy a similar position. He was therefore going to call the attention of his hearers to a part of the country which was not only fairly near London, but which possessed great historical interest. The county had artificial divisions not heard of in any other English county; these divisions were called Rapes. These were first mentioned



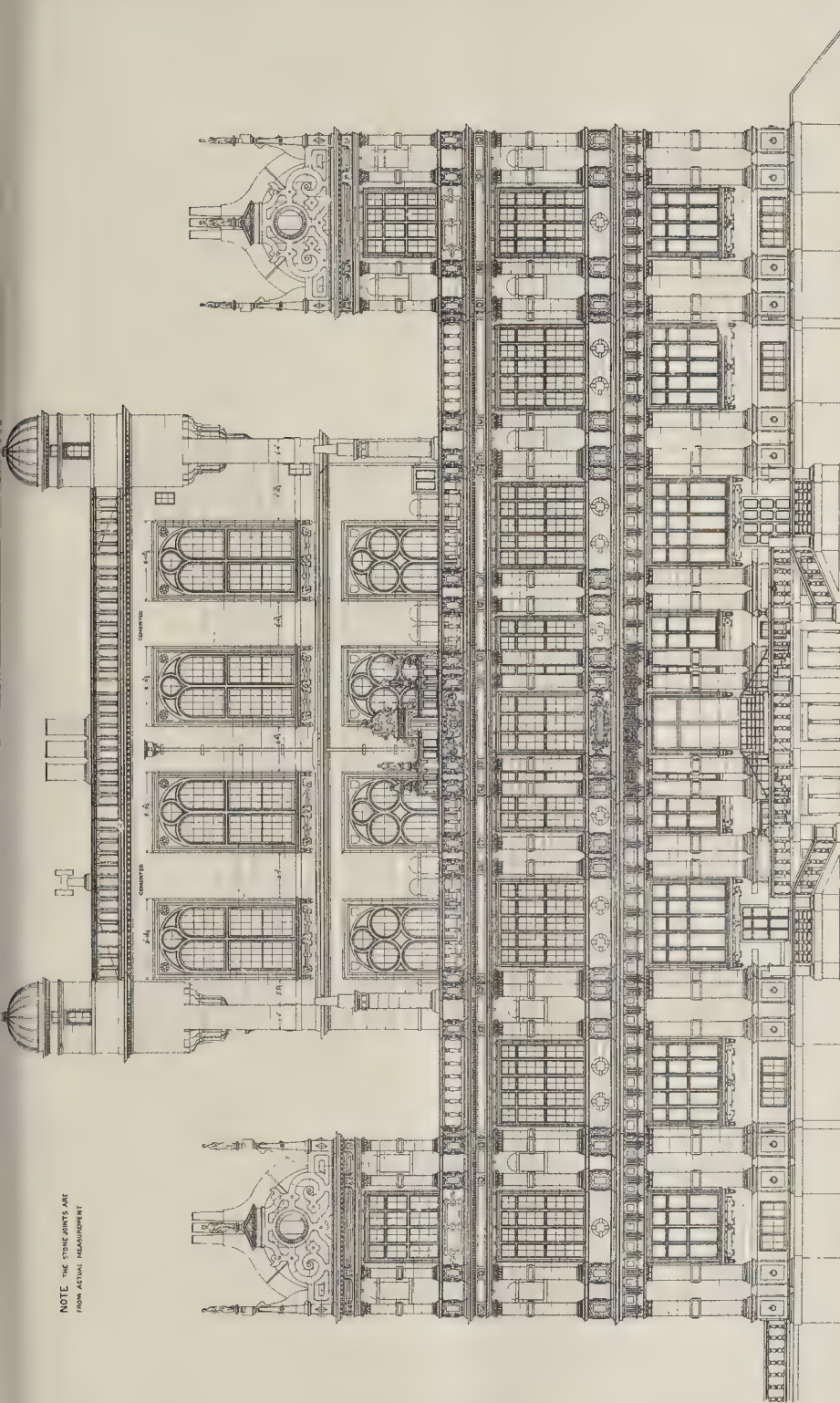


THE BUILDER, APRIL 13, 1889.

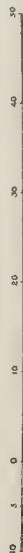




NOTE THE STONE JOINTS ARE  
FROM ACTUAL MEASUREMENT



SCALE OF FEET



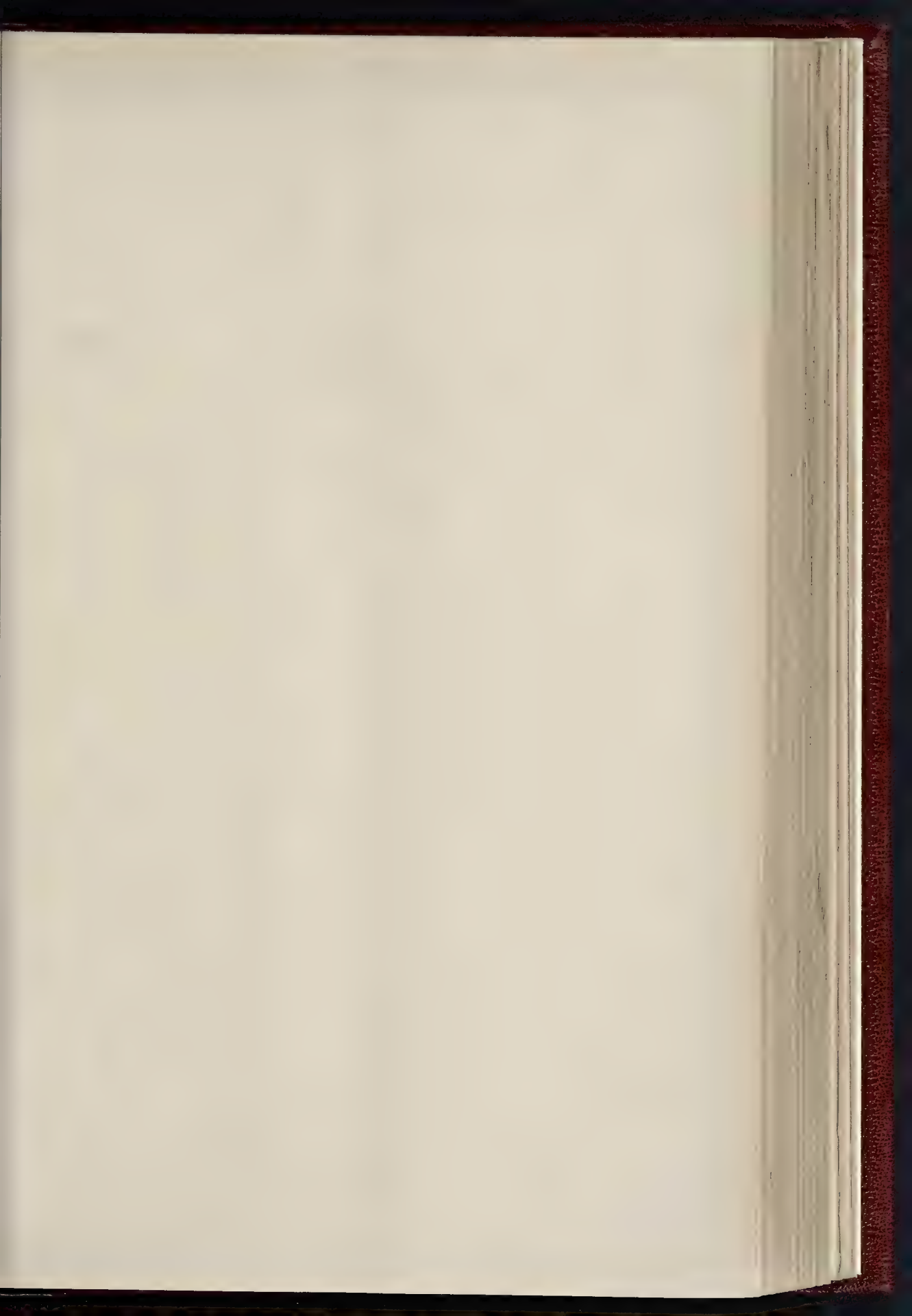
SOUTH ELEVATION

MEASURED AND DRAWN BY MR. PERCY K. ALLEN.

Awarded R.I.E.A. Silver Medal, 1889.

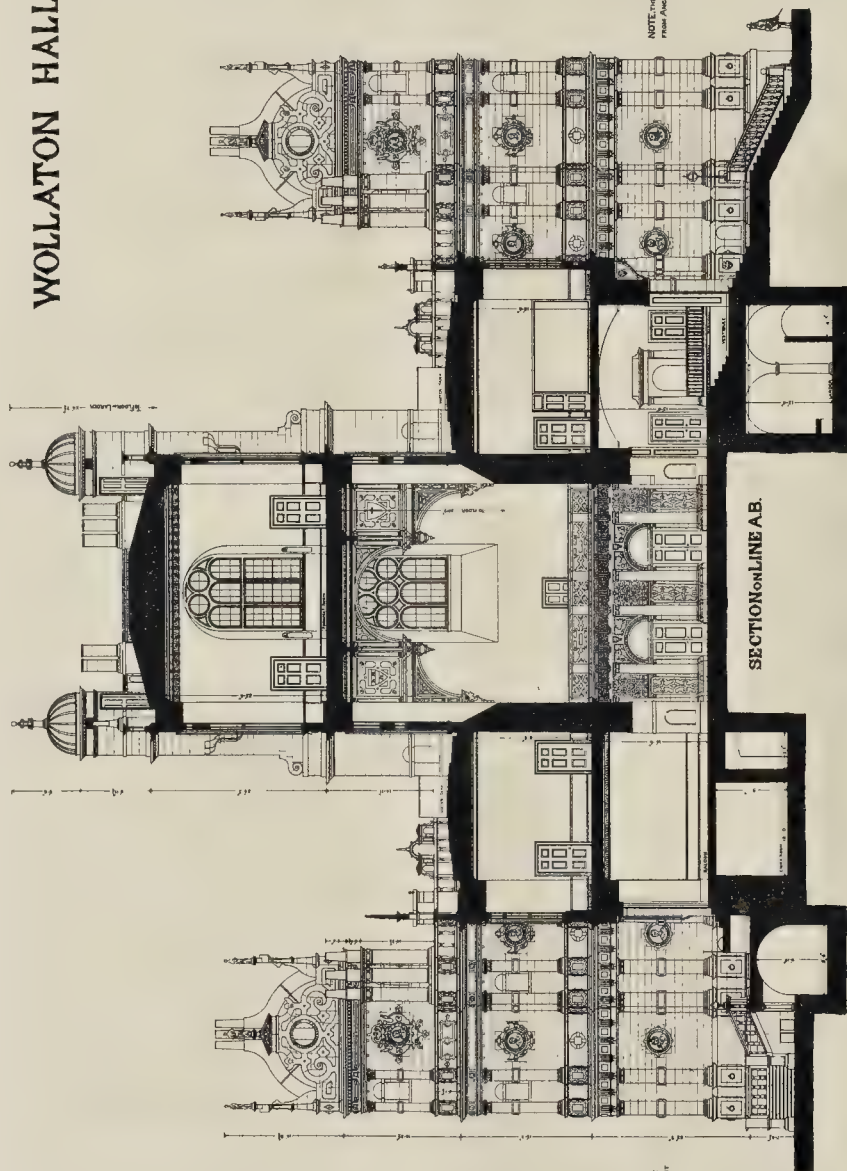






THE BUILDER, APRIL 13, 1889.

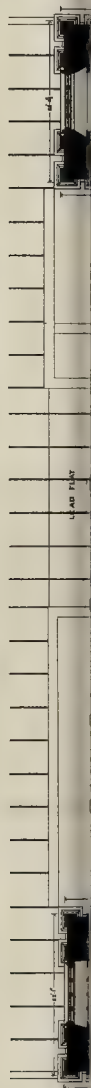
# WOLLATON HALL.



NOTE: THE STONE CARPENTER WAS FROM ASHLEY, LINCOLNSHIRE.

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SECTION ON LINE A.B.





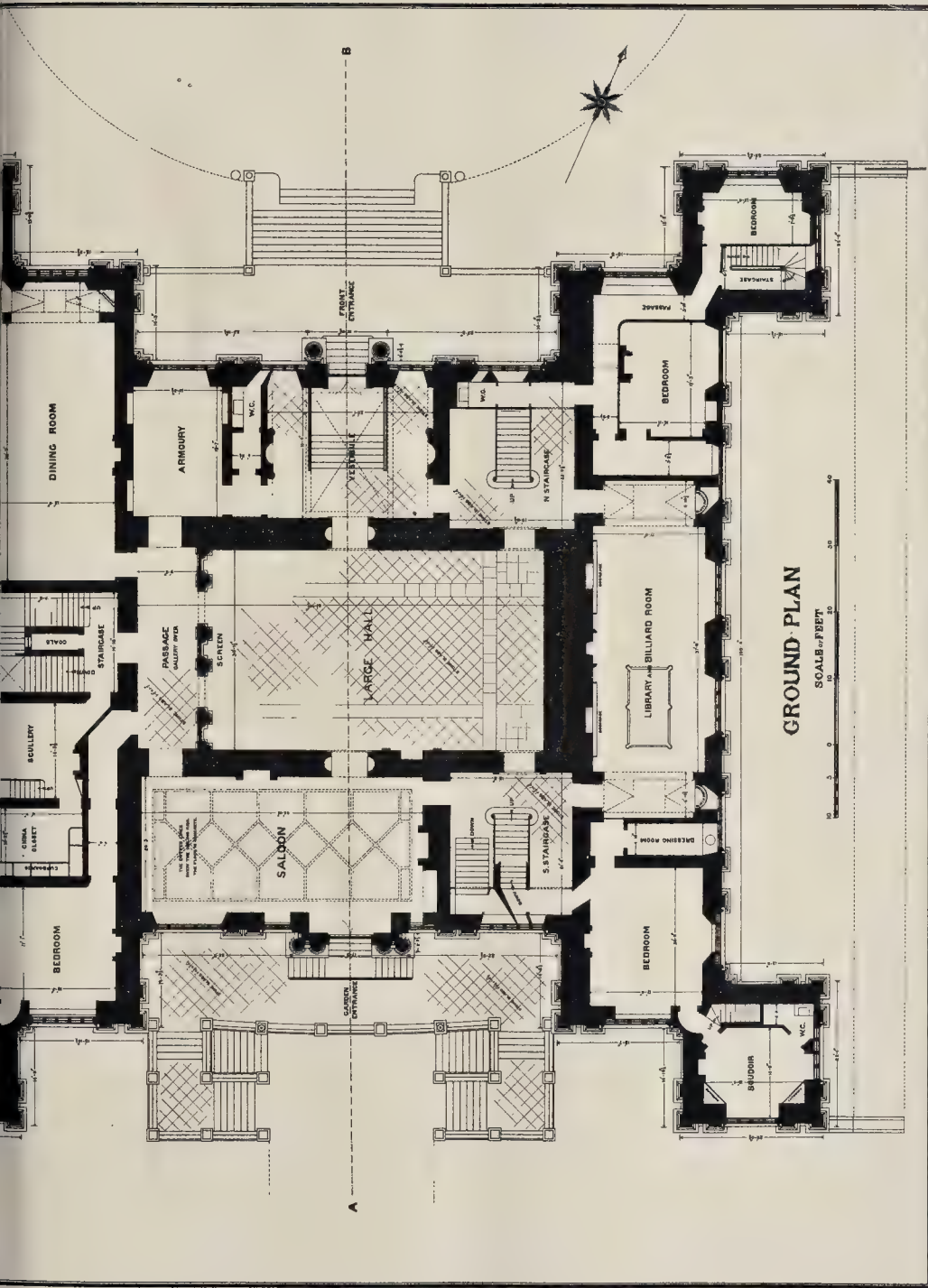


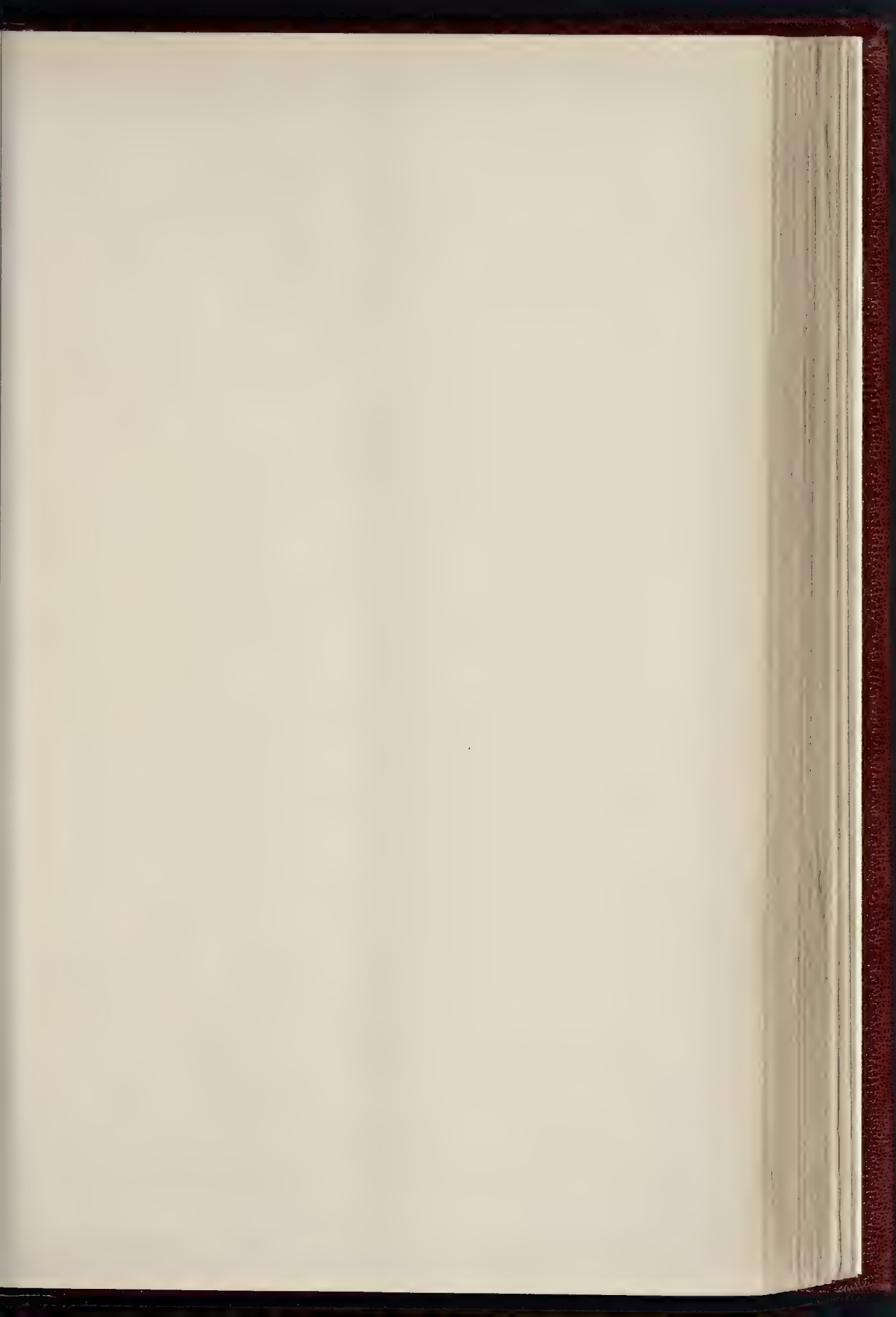
PHOTO. 1710. SPRING & 22. MARINE LANE, CANON, S. LONDON, E.C.

MEASURED AND DRAWN BY MR. PERCY K. ALLEN.

Awarded R.I.B.A. Silver Medal, 1889.

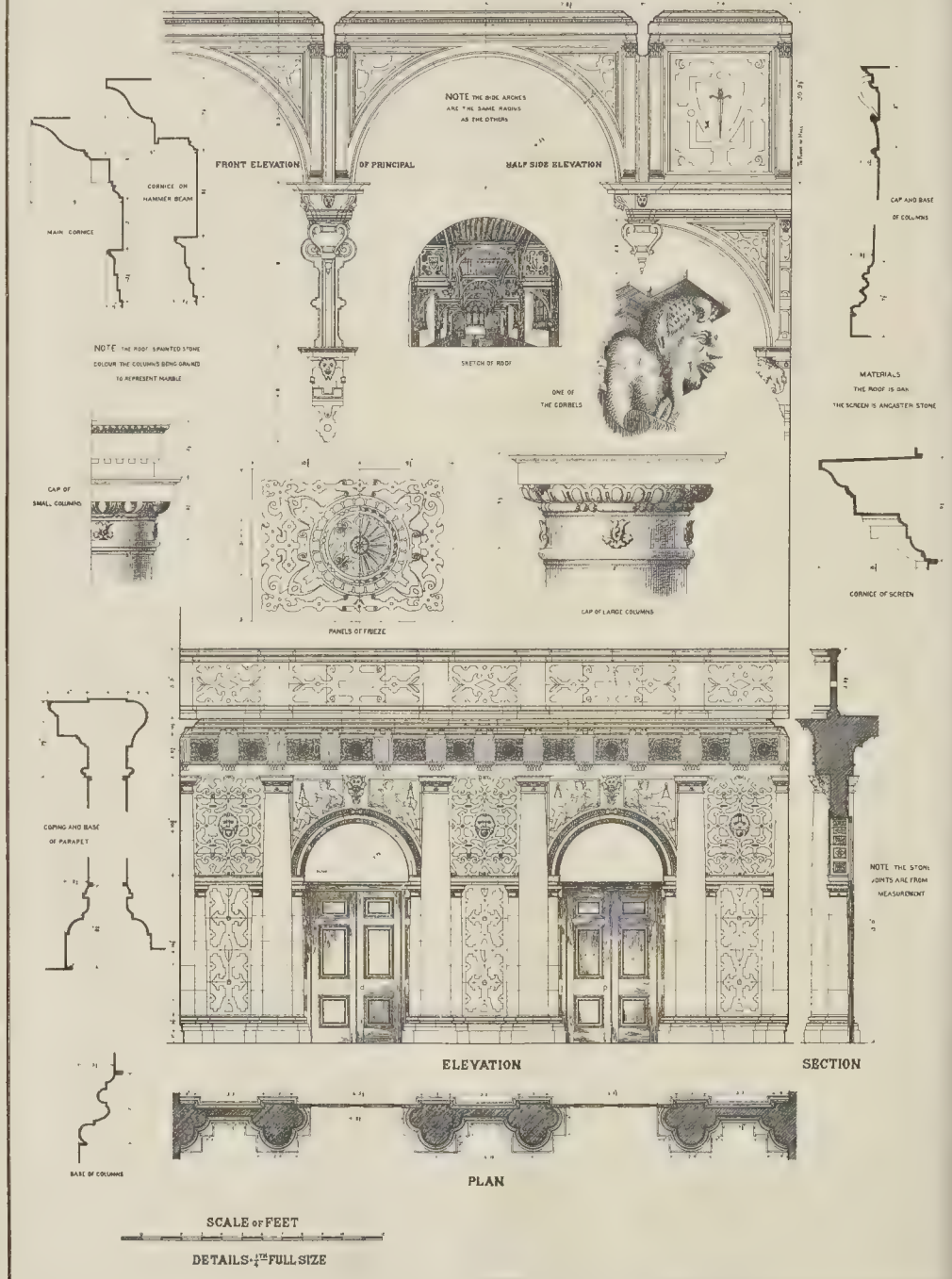






# WOLLATON HALL

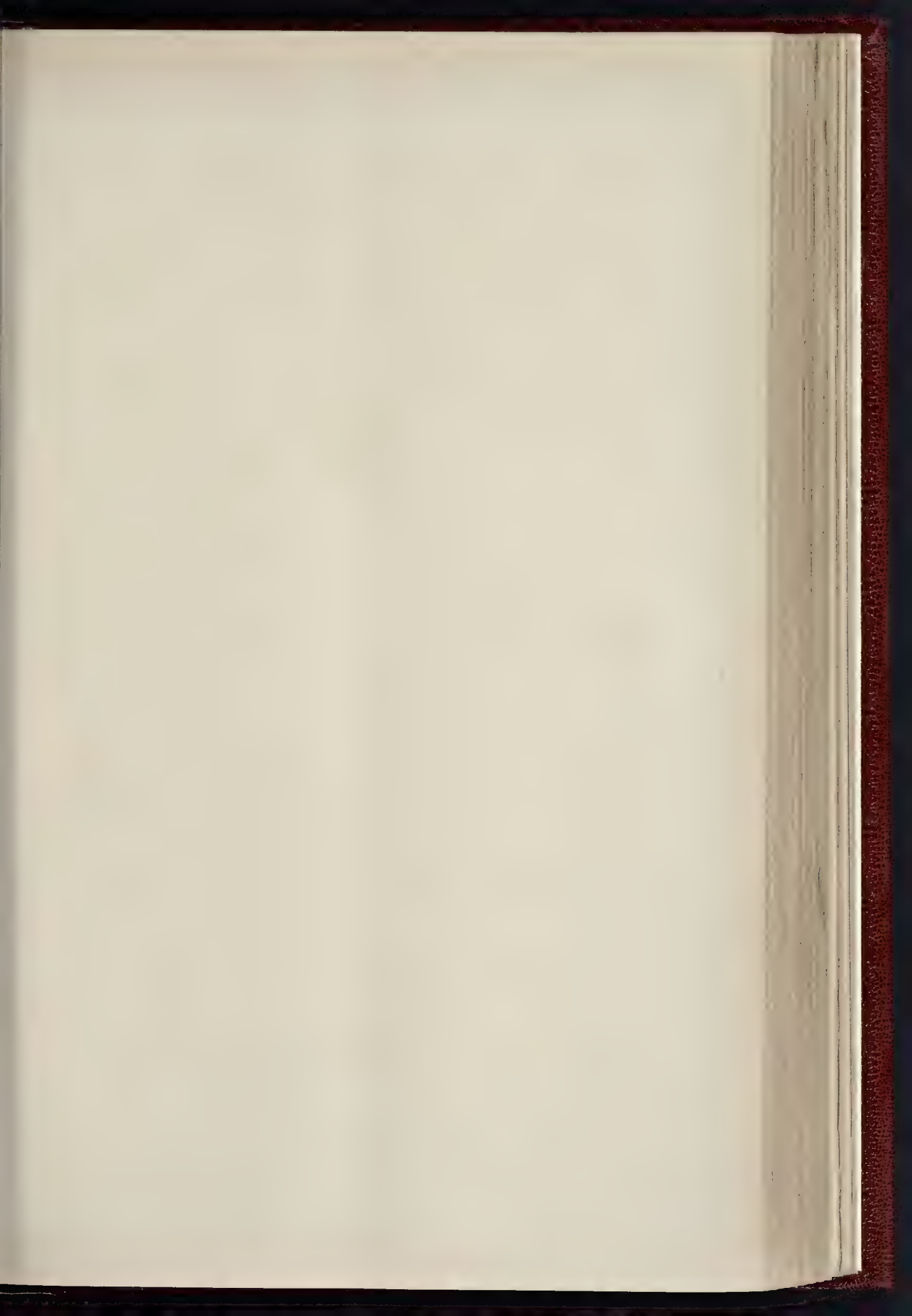
## THE ROOF AND SCREEN OF THE LARGE HALL

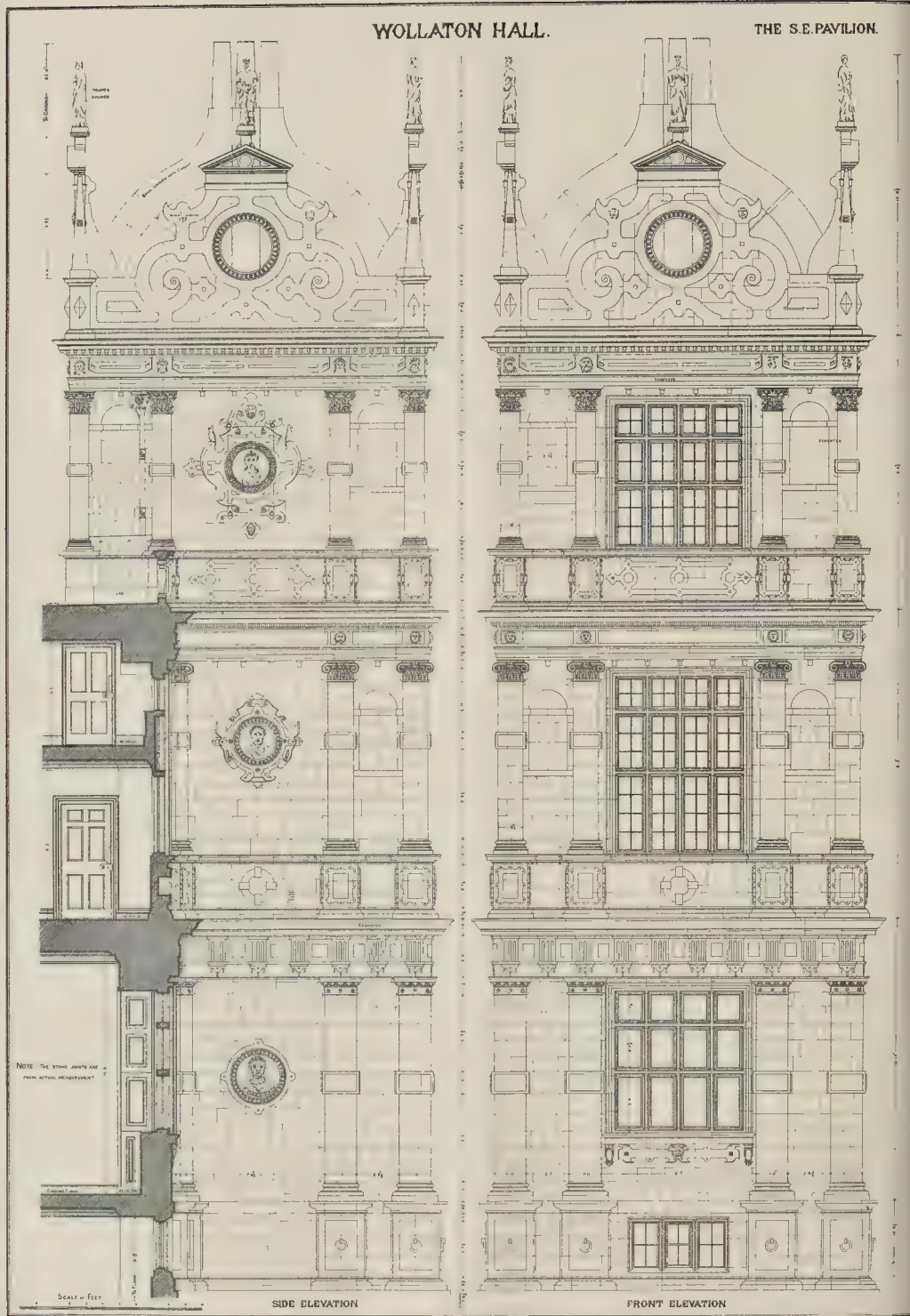


MEASURED AND DRAWN BY MR. PERCY K ALLEN

Awarded R.I.B.A. Silver Medal, 1889.





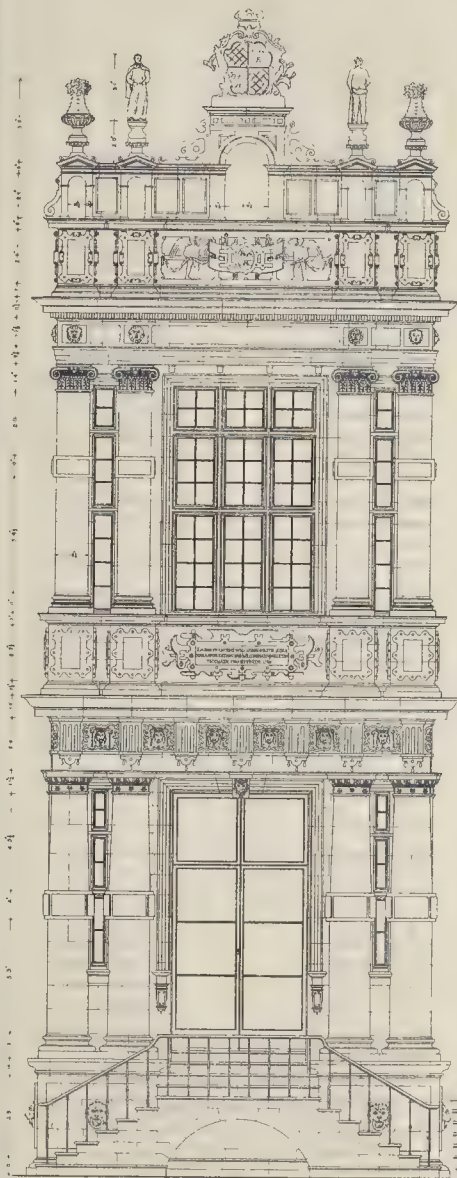


MEASURED AND DRAWN BY MR. PERCY K. ALLEN.

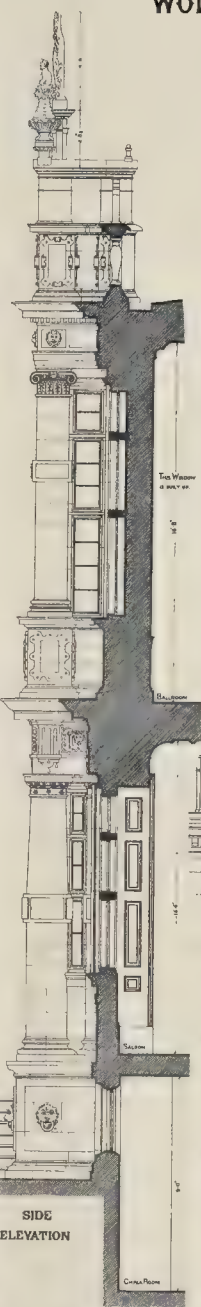
*Awarded R.I.B.A. Silver Medal, 1889.*



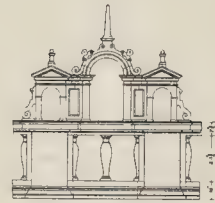
# WOLLATON HALL.



FRONT ELEVATION



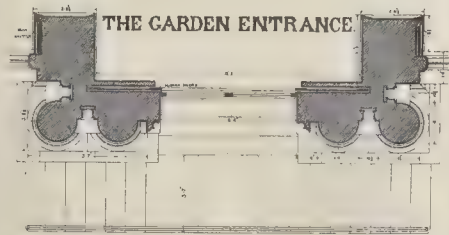
SIDE ELEVATION



ORNAMENT ON PARAPET, WEST ELEVATION.



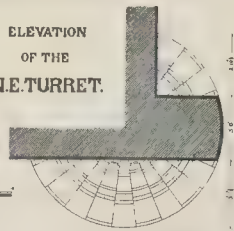
ELEVATION OF THE N.E. TURRET.



GROUND PLAN

NOTE: ALL THE STONE JOINTS WERE PLOTTED ON THE SPOT.

SCALE OF FEET



PLAN OF THE CORBELLING, LOOKING UP

MEASURED AND DRAWN BY MR. PERCY K. ALLEN.

PHOTO LITHO. SPRAGUE & CO. 22, MARTINS LANE, CANNON ST., LONDON, E.C.



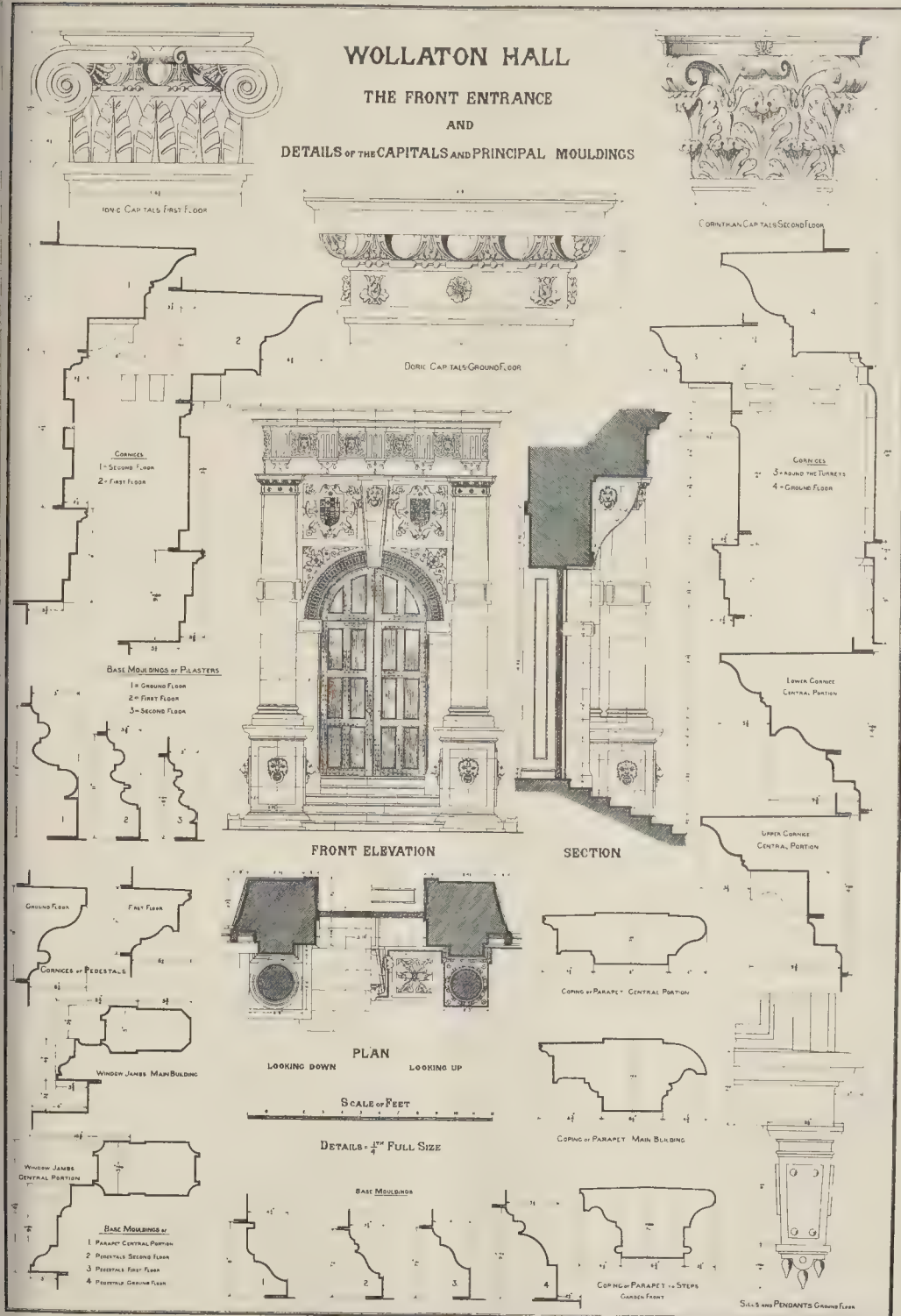


# WOLLATON HALL

## THE FRONT ENTRANCE

AND

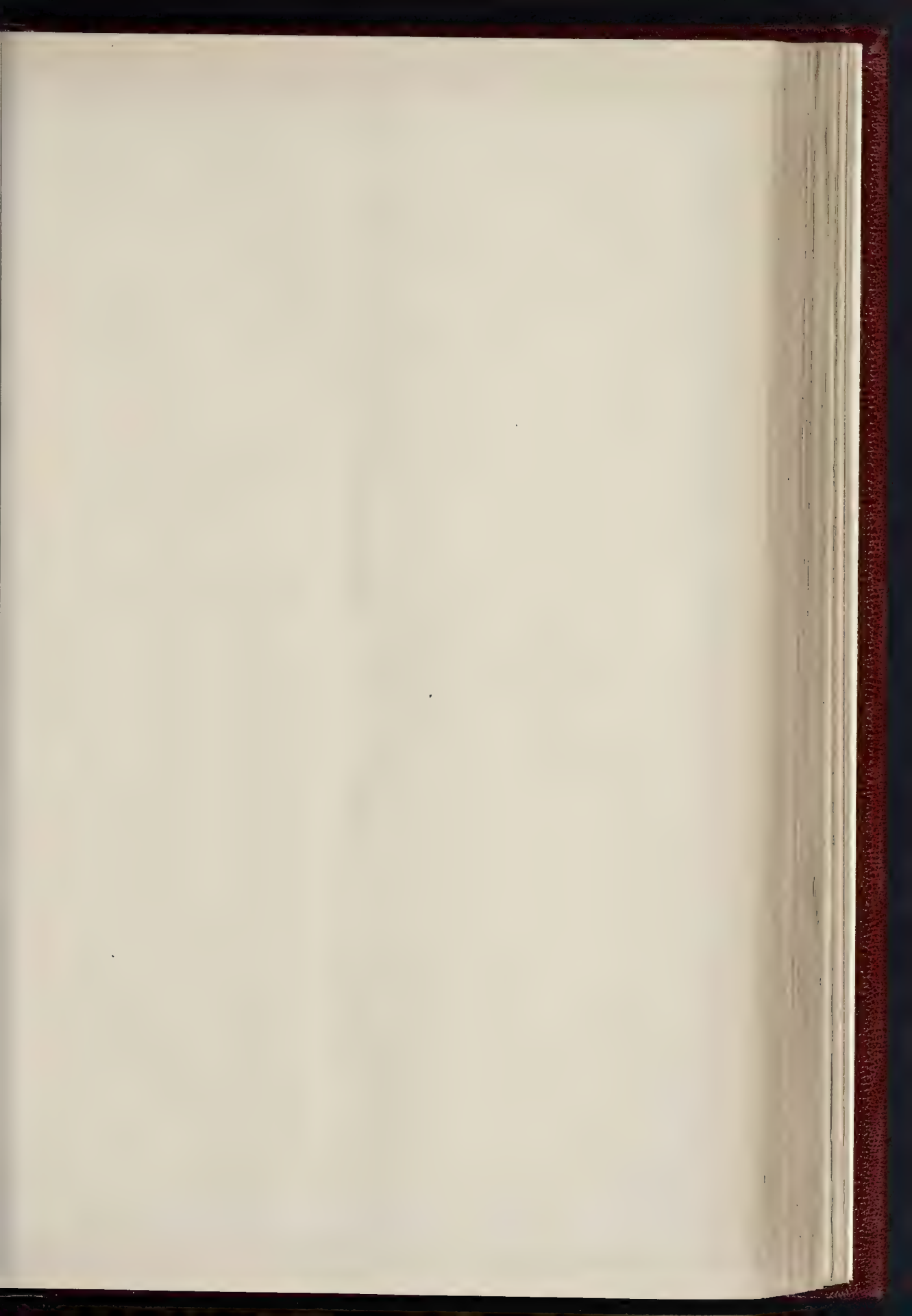
### DETAILS OF THE CAPITALS AND PRINCIPAL MOULDINGS



MEASURED AND DRAWN BY MR. PERCY K. ALLEN.



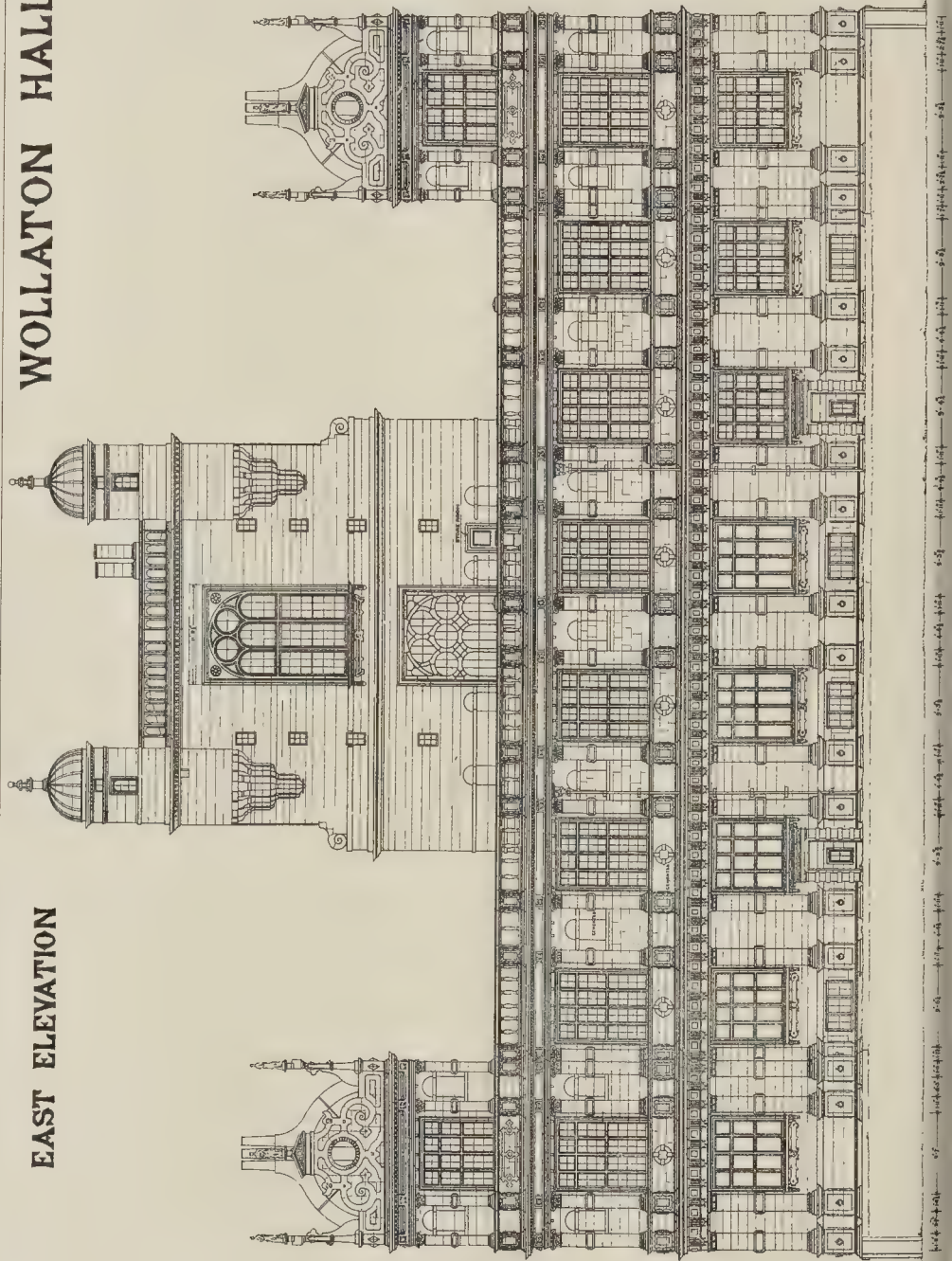




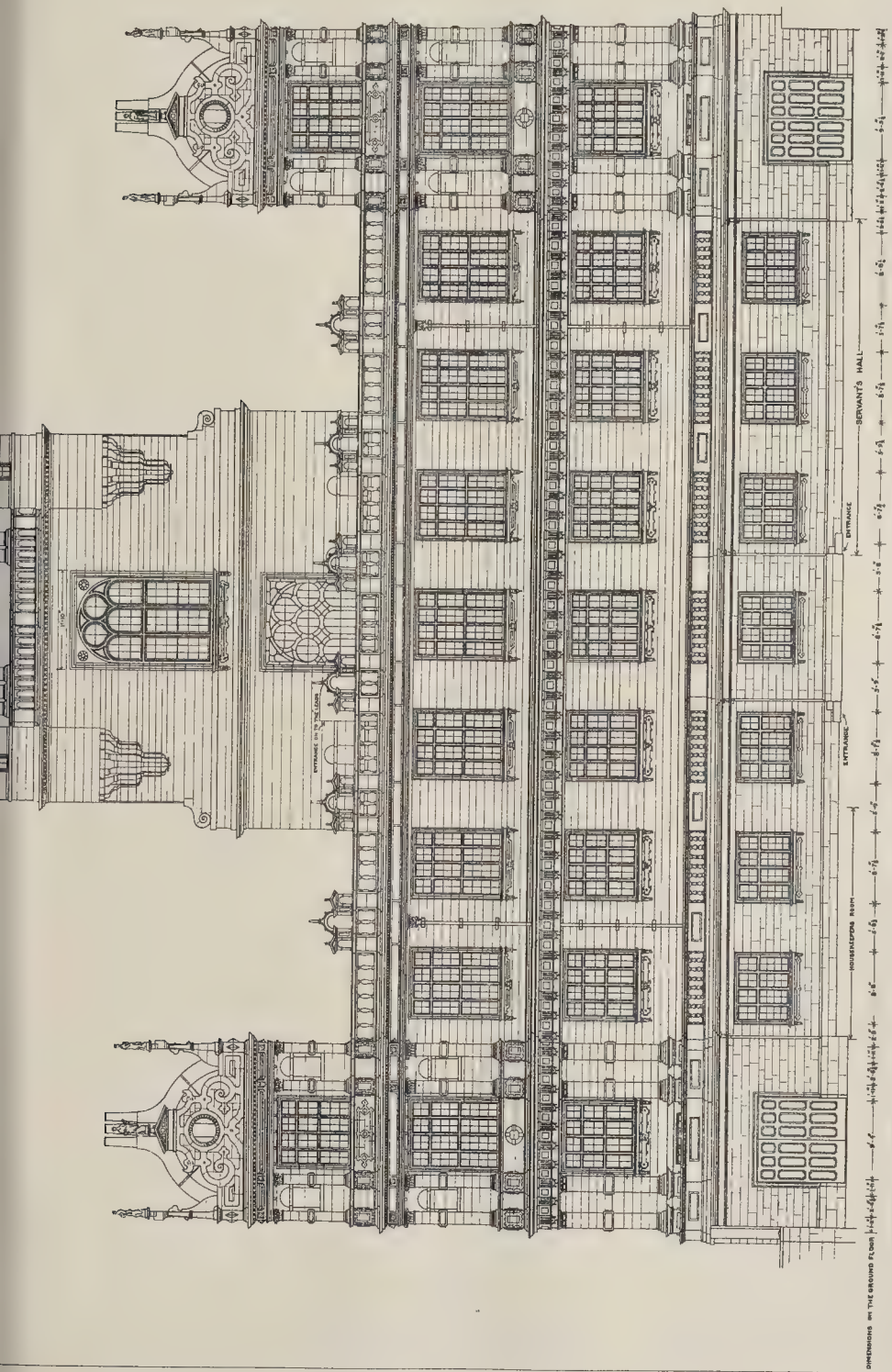
THE BUILDER, APRIL 13, 1893.

## EAST ELEVATION

## WOLLATON HALL.







MEASURED AND DRAWN BY MR. PERCY K. ALLEN.

*Awarded R.I.B.A. Silver Medal, 1889.*





in the Domesday Survey; they were formed by approximately perpendicular lines drawn from the coast, and running northward up the country, each Rape being named after a place immediately on the coast, or near it, and having a castle. The county was about seventy miles long from point to point, but only about twenty-five miles broad. It was divided into East and West (with three Rapes each), which had now become the divisions for the new County Councils. Those were what might be called the artificial subdivisions of the county, but it had also very marked natural subdivisions. Mr. Ridge then pointed out on the map the range of chalk hills running through Guildford and Dorking, and the neighbourhood called the North Downs. South from these chalk Downs were sandhills, with a variety of country, and then came the South Downs. The geological theory was that the chalk passed clean over from the North Downs to the South Downs, covering up the whole of the country known as the Weald. The rivers of the district ran across the chalk, north and south, and passed through the Downs. In the centre of the Wealden formation, quite detached, was a very unique strip of the oolite beds, was a formation that occurred in Dorsetshire. That was the spot where some years ago people had been bored to see if they could find coal, though unfortunately for Sussex they were unsuccessful, so that the county was still habitable (laughter). On the Downs were many camps and barrows, the earliest evidences of human habitation. In fact, there was hardly a high point on the Downs which had not its ditch and parapet, manifestly for purposes of defence. The next part which came into habitation was the piece between the chalk Downs and the sea, extending from the western borders of the county as far as Brighton. A great waste was going on along this part of the coast, and considerable portions of land must have been from time to time swallowed up. Another feature there was the number of harbours and estuaries where the shipping formerly went well up into the heart of the country. The tidal waves and storms came from the south-west, so that the shingle was being continuously carried eastward, and the tendency was for the mouths of harbours to be taken more and more to the east, and the estuaries to silt up. Places which at one time lay on the sea were now inland, and other places, which were on the coast, had been swept away. In this district the Saxons settled, occupying as their centre Chichester, the Roman Regnum, and where sufficient remains had been found to prove that it was a station of some importance. From that point went the Stane Street, running over the hills to London, and important Roman remains had been found at Bignor, on the course of the Stane Street. The South Saxons who inhabited that district were heathens, and it was the last part of the country to be converted to Christianity. Wilfrid, Bishop of York, settled near Selsey Bill, and from that spot converted the South Saxons. At the Conquest, the seat of the bishopric was moved from Selsey to the town of Chichester. After the conquest, there was considerable intercourse between England and the Continent, and a great deal of trade was carried on by the boats of the period, which were able to draw into the shallow harbours of the coast. A good deal was known about the county from the Domesday Survey, recently published in *fac-simile* by the Sussex Archaeological Society. That showed that at the time of the survey only the coast and the courses of the rivers contained any considerable population. The cathedral at Chichester was built in the early art of the twelfth century. A fire occurred here in the year 1185, when the wooden roof was destroyed, and the walls were evidently very much damaged, but an economical repair was carried out by refacing the walls towards the nave during the transition period between Norman and Early English. The east end was then taken down and rebuilt square instead of oval, and in this Transitional work, though freed from the limitations of the earlier work, they still kept the round arches to a great extent. That work represented the most characteristic period of architecture, so far as at particular part of Sussex was concerned. Probably was the time of its greatest prosperity, because, owing to the connexion of our kings with Normandy and other parts of France, intercourse with the Continent would be most active, and it was at such times that architecture was mostly developed. About four miles E. at Boxgrove, was a priory church, the choir

of which was built almost immediately after the east end of Chichester Cathedral, and showed similar features. Near Chichester was the church of Bosham, the place whence Harold took ship on his ill-fated voyage to Normandy. That church was represented on the Bayeux tapestry, but it had no resemblance to the church as it was seen at present. The church contained a fine five-light east window, with Purbeck marble shafts,—very characteristic of the neighbourhood and of the period. Bosham was a picturesque place for sketchers. Close to Chichester was the church of Appledram, with three-light shafted windows in the chancel.

Most of the churches of the district were small, and, as a rule, built of flint, which was not at that time subjected much to architectural treatment. A great many of the churches had little wooden bell-cotes, which were characteristic of the district, and most picturesque; while few of them were without some object of interest. They had, however, been all more or less restored, and no doubt some of them had suffered considerably in the restoration. When young architects went to a church, and found there was not much definite architectural interest in it, they must not assume that of necessity it had contained much of interest before being restored. There were some good fonts in the district, many of them being considerably older than the churches. With the exception of five, every church in the district and on the Downs dated either from the twelfth or the thirteenth century. Most of the churches had some later work, but they nearly all dated from those two centuries, and he did not believe there was one dating from the fourteenth century. The Decorated style of architecture was little developed in France, and the same cause which prevented its development in that country might have had a similar effect in this part of England, namely, the French wars. There was a particularly good Decorated window in the south transept of Chichester Cathedral, containing some hideous glass from Metz; and there was an interesting bit of Decorated work at St. Mary's Hospital in Chichester. The chancel of the hospital chapel was built like a church chancel, and attached to it was a nave constructed like a barn with large oak posts running up and forming nave and aisles. That was the place where the patients lived, and they were able to hear mass, when said in the chapel, through the handsome screen that still remained. After the Reformation, the inmates had little cabins built for them, of what might be called Queen Anne work, and having a most picturesque effect. There were also in Chichester the remains of a Priory Church in the Priory Park, with lancet windows, shafted, at the east end, and, with the exception that the church was in a sad state of decay, it was an interesting building. It was at present the Town-hall, but the Councillors were compelled to adjourn to some more convenient place, as it was not sufficiently comfortable for carrying on the municipal business. In the recreation-ground was a mound which some considered to be the site of the castle taken down early in the Middle Ages. He, however, believed it was the site of a Calvary, there being a similar thing at Lewes at a place called the Dripping Pan, which was formed by taking the earth out to form a great mound, up which the people went to their devotions. To the Cathedral, in the Decorated period, was added the Lady-chapel, and, later, in the fifteenth century, the detached bell-tower. As to the Cathedral spire, he did not wonder that people ignored the fact of its not being the old one, as the selection of stone for the new spire had been excellent, and it had come to look quite ancient. The next important town was Arundel, spelt in Domesday Book as Harundel. The castle contained a circular keep of some interest, and other old remains; but as it had been constantly restored, its archaeological interest had passed away. Arundel contained one of the few Perpendicular churches of the district—a very fine cruciform collegiate church. The east end contained very handsome tombs, and it had recently been decided by the law courts to be the private property of the Duke of Norfolk, but he (the lecturer) saw no reason why it should not be thrown open for inspection by visitors at certain hours. Near Arundel was the interesting Early English church of Clymington, containing an old stone pulpit,—rather a rare thing in that part of the country. Near Arundel was also an interesting Norman church at Burpham. Further up the Arun Valley, on

the north of the Chalk, was Amberley Castle, which one of the bishops obtained leave to crenellate, though it was never a very strong fortification. A little further to the east lay Tarring, near Worthing, with a good church and a hall, belonging to the palace of the Archbishops of Canterbury, who owned a series of properties running right through the county, Tarring being one of the most important stopping-places on their journeys. The building was now used as a national school. A good many interesting cottages were to be found in the district. At Broadwater was a church, the earliest part of which was of Norman date. In restoring it, many of the Perpendicular windows had been taken out, and Early English work substituted, thereby diminishing the interest of the building. Close to Broadwater was Sompting, where was the only English church with what might be called the Rhine spire, in which the sides of the roof, instead of sloping off, on the cardinal sides of the tower, went off diagonally. A great deal of Saxon work was to be found there. Large quantities of bricks were made in the district, but the old people had built largely with flint. He could not say that much Domestic work was to be found in that part of the country. There was an excellent house in the West-street of Chichester, believed to have been designed by Sir Christopher Wren. It was a fine piece of brickwork, and would be a good study for any young man to take up; and there were other excellent houses of genuine Queen Anne work remaining in that city. Turning to the Adur Valley, Bramber was a small village, and Steyning a very unimportant town; but at one time they returned two members to Parliament, showing that the places were once of great importance and consequence. Bramber possessed the ruins of a castle, and a little church containing some Romanesque work with carved capitals. The village also contained an excellent museum, and two or three good old buildings. Steyning possessed a good church, apparently intended to be a cruciform building, but with only one arm left. At the mouth of the Adur Valley were Old Shoreham and New Shoreham, the latter with a fine cruciform Transitional church built about the year 1200. The town still contained an example of the flint of the district, used in chess-board pattern. That kind of work, though carried out most elaborately in Norfolk and Suffolk, never attained in Sussex to the same point of perfection. At Poyning, near the Devil's Dyke, in the vicinity of Brighton, was another of the fifteenth-century churches of the district, the whole of the walls being faced with knapped flints, and some parts built with squared flints,—a very elaborate sort of work. There was another church at Alfriston, almost a counterpart of Poyning's, having merely the four arms of the cross, with a tower in the middle. Both churches were apparently of the same date, being of Perpendicular work, with the east windows of the same design, the same window being reproduced again in Tarring Church. When restoring the windows at Alfriston Church the mason told him that the templates fitted exactly the windows in a church at Lewes. Turning to Brighton, Mr. Ridge said that was about the last place in the world where one would look for anything archaeological, but he might tell them that they could do so without their search being absolutely in vain. The Church of St. Nicholas was one of the little old Down churches, and contained a very interesting old font, there being also a stump of a churchyard cross in the churchyard. Next came Lewes, which had a most picturesque situation, and was possessed of one of the finest priories in the kingdom, though it had had the misfortune of being made over, at the Reformation, to Thomas Cromwell, who took care to demolish it. Lewes, outwardly, was most picturesque, but inside, except for its castle gateway and ruins, it was disappointing. Lewes shared with Chichester the peculiarity of being mentioned in Domesday Book as a place where the manors had enclosures of some sort belonging to them, and he imagined that they were town residences attaching to different properties. At Alfriston was a picturesque wooden parsonage, showing the kind of house people used to occupy in the old days, with very little planning in it, the rooms being merely side by side. West Dean had a fourteenth-century parsonage. It contained a cork-screw staircase in one corner, and an external staircase at the end. At Eastbourne, the old church had Transitional work, between Norman and Early English. At Wilmington were the



remains of a priory. His hearers might have read a notice in the papers of the Wilmington Giant, a great rough figure traced on the side of the hill. The figure was now overgrown with grass, and people were talking of restoring it, though, to tell the truth, it was far from being a work of art (laughter). Next was the valley of the Western Rother, the churches there being of no great architectural interest. The most interesting thing in the district was Cowdray, now in a ruinous condition, and situated rather low down, as those old houses were, near the water. Midhurst contained a good many interesting old houses, and Petworth had a considerable amount of work of the same sort. Petworth House was extremely ugly, but it contained a good deal of fine work and carving. There was some sixteenth-century work in the hospitals and other old buildings of the town. Selham possessed an interesting church—a very small building, with a Saxon chancel arch and doorway, both carved. Most of the churches on the Weald were of a later date than those of the Chalk district. At Hardham were the remains of a priory, and an old Norman church, with some frescoes on the wall, the preservation of which had been attended to. They were apparently of thirteenth-century work. Parham had a large Elizabethan house. Horsham was a town of some interest, the church being a large and now handsome building of different dates, some of the work being nineteenth-century, although he did not know that it was very much the worse for that. Nearly all the old buildings there were roofed with slabs of Horsham stone, which were rather difficult to keep on and point. They were, however, very picturesque, but the supply had either absolutely ceased, or they could only now be procured with some difficulty. Another product of Sussex was the Petworth marble, which was very much like Purbeck, though the little shellfish of which the former was composed were larger. Petworth marble was not used at Chichester because they could get the Purbeck marble easier by sea, though it was utilised a good deal at Canterbury. A feature of that part of the county were the "hammer-pounds." A good deal of iron was at one time manufactured in the district, and to work the mills the water was kept back by embankments, thus forming a series of artificial lakes in the hollows of the hills, which were very picturesque features in the landscape. The manufacture of iron in that part of the world had gone on from the time of the Romans, and had only ceased in the present century, as the district, depending on its trees to supply fuel, was unable to compete with the coal-producing counties. In the Weald were situated a good many comfortable stone houses of the sixteenth or seventeenth centuries. These, no doubt, had their origin very much in connexion with the iron manufacture. As to timber houses, his hearers could not do better than read what Mr. Nevill had recently written about the old Surrey houses in the *Builder*, his remarks being very applicable to the Sussex houses. East Grinstead was a picturesque town, and at Pevensey was a castle with an outer wall of Roman bricks, built in courses, and having an Edwardian keep. Pevensey also possessed two fine churches. Across the marsh lay Hurstmonceaux Castle, an early brick building of about the beginning of the sixteenth or end of the fifteenth century. They then came to Hastings and Battle, where were the remains of the old Abbey and its gateway, Battle being also a most interesting place. Hastings contained two good perpendicular churches—St. Clement's and All Saints', and some small remains of its castle. Not far from Battle lay the church of Etchingham, which was well worth studying for the superiority of its design. The church, the walls of which were all worked in ashlar, contained some beautiful Decorated tracery, and also the old stalls, screen, and brasses. Bodiam Castle was built about the end of the fourteenth century by a man who had been in the French wars. It now stood externally complete, with its surrounding moat, which, when covered with a wealth of water-lilies, had a most charming effect. Lastly, they came to the interesting bit of country including the two old towns of Rye and Winchelsea, which were two of the Cinque Ports. Those ports in the Middle Ages had the responsibility of guarding the country against invasion, and they were then important places, perfectly able to perform the duty required of them. Although at one time those were im-

portant seaports, the sea had now left them. The water had encroached upon Old Winchelsea, so that the inhabitants removed to a rocky site, laying out the New Winchelsea in forty squares, the lines of which could still be traced. A great many of the houses were constructed with cellars, in which were stored the French wines, then an important part of the commerce of the place. The sea, however, eventually left New Winchelsea, and so ruined it. Winchelsea contains the remains of a Decorated church with some interesting and elaborate monuments. Rye had a very large church, but it had suffered tremendously in the French wars, and had been very much knocked about. The church stood in the middle of the town, which was more prettily situated, and lent itself better to drawing than almost any other town he knew of. Rye had not been too prosperous a place, the result being that the old houses had been left pretty much as they were. Rye was the most picturesque place in Sussex for old Domestic work, and he thought he could not do better than leave his hearers to the contemplation of Rye (applause).

Mr. H. O. Cresswell, in proposing a vote of thanks to Mr. Ridge, said he was not surprised that he had dilated a little on the county itself, for anyone who had travelled about Sussex with his eyes open could not help admiring its beauty, quite apart from its architecture. He was surprised, however, that Mr. Ridge had not said something more about the Sussex marble in his geological introduction, though he had touched upon it afterwards. He supposed there was no doubt that the shafts at Chichester were of Purbeck marble. Etchingham Church, everyone would agree, was a most beautiful specimen of fourteenth century work, the tracery being very elegant, and the whole effect exceedingly picturesque. Etchingham Church was illustrated in the Association's "Sketch Book" not long since. Mr. Ridge had given the forms of "Arundel" and "Harundel," and it had been suggested that for the misuse of the letter H the Cockney was responsible. He did not believe that was the case, for in talking the other day with a philologist, the latter informed him that the letter H was only misused or omitted in those parts of England where the Normans had penetrated.

Mr. L. A. S. Stokes seconded the vote of thanks. Sussex churches, he said, were extremely picturesque where the flint was used, a coat of plaster being thrown over it, and the flints showing here and there.

Mr. P. M. Johnston referred to the encroachment of the sea on the coast of Sussex, where entire villages had been washed away. Middleton old church had thus disappeared, a new one being erected about the beginning of the present century. The churches in the western part of the county afforded a most interesting field for students of architecture. Rustington Church, never mentioned in the accounts of that part of the country, had some fine architectural features, and Lymington had an interesting church which had almost been spoilt in restoration. Another church he was sorry to see had been restored was Patching, an Early English example of very much the same type as Chichester Cathedral. Restoration, as a whole, had been a great curse to Sussex, and especially between the years 1830 and 1860, when much valuable work was destroyed (applause).

Mr. Webb inquired whether Mr. Ridge had noticed the foreign influence in the churches round Lewes, which were so like those to be found on the French coast?

The vote of thanks to Mr. Ridge was then put and carried by acclamation, and a similar compliment paid to Mr. P. M. Johnston, for the excellent series of photographs exhibited by him.

Mr. Ridge, in replying, said he had noticed the foreign influence in some of the Sussex churches. He had observed it notably in the case of Newhaven Church, having seen a church in Normandy which corresponded with it. In the Ouse Valley were three round towers, the reason for their existence, no doubt, being that stone was scarce there; the towers were built of flint, and without stone quoins.

The proceedings then terminated.

**Obituary.**—We regret to hear of the death of Mr. John Cundall, architect, Leamington.

#### INSTITUTE OF BUILDERS.

The annual dinner of this Institute was held at the Hôtel Métropole on Friday the 5th inst. Mr. Frank May, J.P., the President, in the chair. Among those present were Colonel Bird, Captain Widnell, Messrs. T. Blashill, L. J. Maton, F. Chambers, C. J. Shoppee, H. G. Harris, and Geo. Burt. After the toast of "Queen," and that of "The Prince and Princess of Wales and the other Members of the Royal Family," the President proposed "The Navy, Army, and Auxiliary Forces," to which Colonel Bird responded.

In proposing "The Institute of Builders," the President stated its history from its foundation as the Builders' Society in the year 1834, particularising the services rendered by it to the trade both under its old title and since its incorporation, making special reference to the Benevolent Fund.

Mr. Thomas F. Rider in a humorous speech proposed "The Architects and Surveyors," Mr. Blashill and Mr. Shoppee replying.

Mr. Howard Colls proposed "The President," to which Mr. Frank May replied.

The toasts of "The Past Presidents and Secretary" having been proposed by Mr. H. T. Ashby and Colonel Bird, Mr. George Burt and Mr. Richard S. Henshaw responded respectively.

The toast of "The Visitors," proposed by Mr. John M. Burt and replied to by Captain Widnell, was the concluding item on the list.

#### THE LONDON COUNTY COUNCIL.

A MEETING of the London County Council was held in the Council Chamber of the Corporation of London, Guildhall, on Tuesday last, Lord Rosebery in the chair.

**Loans for Paving.**—The report of the Finance Committee stated in one of its paragraphs that the Committee had considered a letter from the Vestry of Newington, requesting sanction to borrow the sum of 7,000*l.* for paving works. The Vestry stated that they contemplated entering into a contract with the Victoria Stone Company to supply and execute the work at a price much less than previously paid for that or York stone, the Company agreeing, if secured by a mortgage, to accept payment by twenty equal annual instalments, with interest at 3½ per cent. calculated on the balance from time to time remaining unpaid. The Vestry further stated that they were satisfied that this stone would last considerably more than twenty years in side streets where it was to be laid, and in view of other loans being raised, considered it desirable to keep the instalments and interest payable out of current income as low as possible, and to spread the repayments over the longest possible period. The power of the Vestry to borrow was given by the 183rd Section of the Metropolitan Management Act, 1861, and that section authorised the Vestry to borrow, for the purpose of defraying any expenses incurred or to be incurred by the Vestry in the execution of the Act, any sums of money necessary for defraying any such expenses, and for the purpose of securing the repayment of any sums so borrowed the Vestry might mortgage the rates upon the credit of which such sums were borrowed. It did not appear, however, that the words of the section gave the Vestry power to execute a mortgage of rates to secure the repayment of the contract price of the proposed paving works, and, seeing that the Treasury also in a recent case objected to more than fifteen years being allowed to repay a loan for York stone paving work, the Committee recommended—

"That the application of the Vestry of Newington that the Council should sanction a proposal by the Vestry to mortgage the general rates of the parish, to the extent of 7,000*l.*, be not granted, as the Council are advised that it is doubtful whether the Vestry have power to mortgage the rates as a security for the performance of a contract."

Three of the local members (Dr. Bott, Mr. Bassett Hopkins, and Mr. Marsland) spoke in favour of referring the matter back to the Committee for reconsideration, Dr. Bott remarking that, having regard to the superior durability of Victoria stone as compared with York stone, the request of the Newington Vestry might well be acceded to. Mr. Thornton spoke in support of the amendment to refer the matter back, although he said he could not agree with all that was said in favour of Victoria stone. It was quite true that, if undisturbed, Victoria stone would last longer than York stone; but if it had to be disturbed it became comparatively useless. After some further discussion, it being stated that the Solicitor to the Council (Mr. Ward) was of opinion that the rates could not be legally mortgaged in the manner suggested, the recommendation of the Committee was agreed to.

**The Midland Railway Bill and Open Spaces in St. Pancras.**—The Parliamentary Committee reported that the Midland Railway Bill had been before the Select Committee of the House of



Commons. The Select Committee concurred with the Council in considering that the area of land proposed to be provided by the Company as an equivalent for the land to be acquired was inadequate. The Parliamentary Committee also reported that they had passed a resolution stating that they adhered to their opinion that in cases where open spaces were taken under Parliamentary powers, there ought, as a rule, to be obtained at least an equal area of land in exchange. Mr. Firth, M.P., the Deputy Chairman, announced that the House of Commons Select Committee had decided, with reference to the St. Pancras case, that, in exchange for the 6,000 square yards of land to be taken by the Midland Railway Company, a piece of land 4,200 yards in extent, and the sum of 12,000*l.* should be given by the Company.

**The Artisans' Dwellings Act.**—The Parliamentary Committee recommended that the following clause be inserted in the Bill which the Council is promoting in Parliament for amending the Local Government Act, 1888:—

"The Medical Officer of Health, appointed by the London County Council in pursuance of the principal Act, shall be deemed to be a Medical Officer appointed by them for the purpose of the Artisans' and Labourers' Dwellings Improvement Act, 1875, and the Acts amending the same, and in addition to the duties which he shall perform the duties and be subject to the liabilities imposed by those Acts on a Medical Officer of Health of a local authority, and Section 13 of the said Act shall be repealed."

This was agreed to.

**The Administration of the Metropolitan Building Act.**—The same Committee also reported that another matter upon which further legislation was desired was to obviate the necessity of the Chairman of the Council signing various documents as required by the Metropolitan Building Act, 1855, and enabling the Chairman of the Improvements Committee or some other person approved by the Council to sign such documents. The Committee, with a view of effecting these objects, recommended that the following clause be inserted in the amending Bill before mentioned:—

"The approval by the Council of any plans or particulars under the provisions of the Metropolitan Building Act, 1855, or any Act amending the same, shall be signified by writing under the hand of the Superintending Architect of Metropolitan Buildings, and countersigned by the acting Chairman for the time being of the Metropolitan Improvements Committee of the Council, or by any other person appointed for that purpose by the Council."

This was agreed to.

**The Metropolitan Water Supply.**—The Parliamentary Committee further reported that, in pursuance with a resolution of the Council of the 19th ult., they had considered the question of making application to Parliament in respect of the Metropolitan water supply, and they had come to the conclusion that the best way of obtaining the object proposed by the Council's resolution on March 19 would be to embody in a second amending Bill proposals for extending the powers of application to Parliament, given by Section 14 of the Metropolitan Local Management Act, 1855, to matters affecting the water supply, and to include provisions for the costs of inquiry in the Council's Money Bill of this session. They therefore recommended:—

That a separate Bill be introduced into Parliament for conferring powers on the Local Council to introduce Bills relative to the Water supply, and that the matter be referred back to the Parliamentary Committee, with instructions to prepare and submit such a Bill to the Council."

This was also agreed to.

**Gates and Bars in the London Streets.**—The same Committee reported that they had had before them the resolution of the Council of March 15, referring it to them to consider and report what steps should be taken to remove the bars, gates, and fences, which now interfered with the free use by the public of certain thoroughfares in the Administrative County of London. The Solicitor had presented a report to the Committee on the subject, and, having considered this, they had passed the following resolution:—"That, having heard the Solicitor, the Committee are of opinion that the only practicable method of dealing with bars, gates, and fences is by lodging Private Bill notices in October and November, and that as the general inquiry into the question stands referred to the Highways Committee, the Parliamentary Committee are awaiting their report."

**The New Street from Holborn to Islington.**—One of the recommendations contained in the Report of the Improvement Committee was as follows:—

"That the application of the Holborn District Board that the width of the portion of the proposed new street, from the Holborn Town Hall to Islington, which lies between Finsbury and Colindale-square, may be increased from 50 to 60 feet, be not granted."

After some discussion, it was agreed that this question should be referred back for further consideration.

**Gift of a New Park for South London.**—The Parks and Open Spaces Committee, by its Chairman, Lord Meath, brought up an important report, one of the principal items of which was that the new park at Camberwell, the gift of an anonymous donor, be opened on Saturday next, and that the park be named, in accordance with the wish of its donor, "Myatt's Fields."

**The Housing of the Council.**—Sir Walter de Souza, Chairman of the Special Committee appointed on the 19th of February to consider and report upon the best method of obtaining suitable premises for a Council Chamber and the necessary offices, and instructing the Committee, before reporting on the best method of obtaining suitable premises, to see how best the present Council Chamber at Spring-gardens could be enlarged, brought up the Report of the Committee, who stated that they had come to the conclusion that the present Council Chamber [the old Board Room] at Spring-gardens could be enlarged sufficiently to accommodate the Council. The plan submitted with the report showed how, in the opinion of the Committee, this could best be done without incurring a large expenditure of money, which, having regard to the uncertainty of the future requirements of the Council, the Committee considered would be undesirable. The plan provided for a Council Chamber 50 ft. by 53 ft., one end being semicircular, and of a total superficial area of 2,340 ft. (the present Board-room being 30 ft. by 40 ft., and of a total superficial area of 1,200 ft., exclusive of the space occupied by the Press and Public Galleries. By the proposed scheme the Press and Public Galleries would be much larger than in the present Board-room, the former being sufficient to accommodate 45 persons and the latter 120 persons (the present galleries only seating 17 and 35 persons respectively). The plan also provided for four Committee-rooms, including the two rooms at present set apart for the use of the Committees of the Council. The lease of the main building, which it was proposed to add to, would expire on April 5, 1895, having thus about sixty-nine years to run. The ground-rent was £350 per annum. The alterations, which it was thought would take about five months to carry out, could be effected at a cost of about £10,000. The Committee accordingly recommended:—

That the plan submitted for the enlargement of the present Board-room, and providing for two additional Committee-rooms be approved."

The Committee further reported that, in the event of the suggested alterations being carried out, certain rooms used by some of the present staff on the ground and first-floors, and near the present Board-room, would be interfered with, and that it would therefore be necessary to obtain additional office accommodation outside the building, and they submitted a recommendation as to the acquisition of certain premises for this purpose in the vicinity.

The following important "addendum" was appended to the report of the Committee:—

"The undersigned, whilst agreeing with the Committee that the plans submitted by the Architect, and referred to in the report, show the best means of altering and converting the present premises, in the terms of the reference, are of opinion that such alterations will be only sufficient for temporary purposes, and that the existing site and area occupied by the present Council buildings will not be found permanently fully adequate for the work of the Council, and that proper municipal buildings on a much more important scale will be eventually required."

This addendum was signed by Messrs. Frank Debeuham, Robert W. Edis, Ernest Collard, and Alfred J. Hollington. After some discussion it was resolved, on the motion of Mr. Eneas Smith, seconded by Mr. Boulton, to postpone the consideration of the subject until after the Easter recess.

**District Surveyors.**—The following notices of motion were referred to the Building Act Committee for consideration and report:—

"That in the opinion of the Council all District Surveyors to be appointed by the Council should be appointed at a fixed salary instead of by fees, and on condition that they should devote their whole time to the office, and not to engage in private practice; also that all fees payable in respect of their office be paid into the County Council Account." (By Mr. Westcott.)

"That the Building Act Committee and the Standing Committee do confer as to a reform of the system hitherto followed in the appointment of District Surveyors in the Metropolis, with the view of arranging that the duties hitherto discharged by the District Surveyors shall be performed by a department of the Council, and that all fees received in connection with such duties shall be paid directly to the Council." (By Mr. Lewis, as an amendment to Mr. Westcott's motion.)

**The Church of St. Mary-le-Strand.**—On the motion of Captain Probyn, seconded by Mr. Augustus Harris, it was referred to the Improvement Committee and the Housing of the Working Classes Committee to consider and report on the best method of increasing the accommodation for vehicular traffic in the Strand, having regard at the same time to the desirability of preserving the Church of St. Mary-le-Strand, if practicable.

**The Illuminating Quality of Gas.**—On the motion of Mr. J. Williams Benn, seconded by Mr. Burns, it was resolved:—

"That it be referred to the Sanitary and Special Purposes Committee to consider and report on the desirability of the Council applying to the Board of Trade to introduce a Bill in the present session of Parliament to localise the use of a portable photometer for testing the lighting power of gas in parts of London remote from any official testing place."

The Council adjourned at 7 o'clock, after a sitting of four hours, another meeting being arranged for Thursday last.

## GOTHIC STAIRCASES.

SIR,—It is not surprising that there is a little trouble over these things at Westminster Hall, seeing that there is scarcely any authority in ancient Gothic architecture for any but navel or corkscrew staircases. I can only call four examples to mind of a more spacious and convenient form, viz., that at St. John's, Beverley (the Minister), conducting to the Chapter House, which has two flights (under an arcade) meeting at one landing in front of the door; that of Canterbury (external), seeing that there is a straight flight, an open arcade at each side, and a roof over it; that at Beaulieu, Hants, a straight flight in the thickness of the Refectory wall, with a beautiful arcade on one side; and that at Christ's College, Manchester, with three returns in the corner of the cloister, which, being of Tudor date, is nearest to our modern ideas of what a staircase should be. These are all convenient and beautiful architecturally. At Westminster the fear of sacrificing too much of the area of the new rooms appears to have created difficulties with the staircases, but for this the Committee are, doubtless, quite as responsible as the architect.

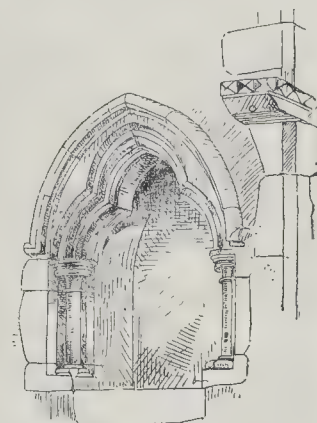
## ANTIQUARY.

\* \* Our correspondent's summary of existing Gothic staircases other than navel ones is of interest; but our point is not so much against the stair designs in themselves, as against the breaking up of Westminster Hall for staircases giving access to inconvenient rooms which were never wanted except for an archaeological whim. We suspect the writer is in error as to the responsibility of the architect. His first plan showed a staircase in two flights, one against the wall, and the lower one projecting far out at right angles into the body of the Hall.

## "NORMAN BRACKET IN EYNSFORD CHURCH."

SIR,—With reference to the interesting letter on this subject published in last week's *Builder*, the accompanying sketch, made some years since, may be of interest to your readers, as illustrating your correspondent's remarks. I regret that I have no details of the piscina, which is of very beautiful design. The church itself, with its Norman tower and Early English apse and transepts, has many points of value to the architect as well as the archaeologist.

The obvious peculiarity of the bracket shown in the sketch, and described by your correspondent,



Bracket in Eynsford Church.

lies in the fact that it was not originally designed for the position it occupies, nor for the use it is conjectured to have been put to. It would appear to have been a portion of the abacus of a Norman arch—perhaps of that to the chancel.

There is no other Norman work visible nearer than the western tower, so it is singular that this isolated fragment should have been retained—especially as it possesses no beauty.

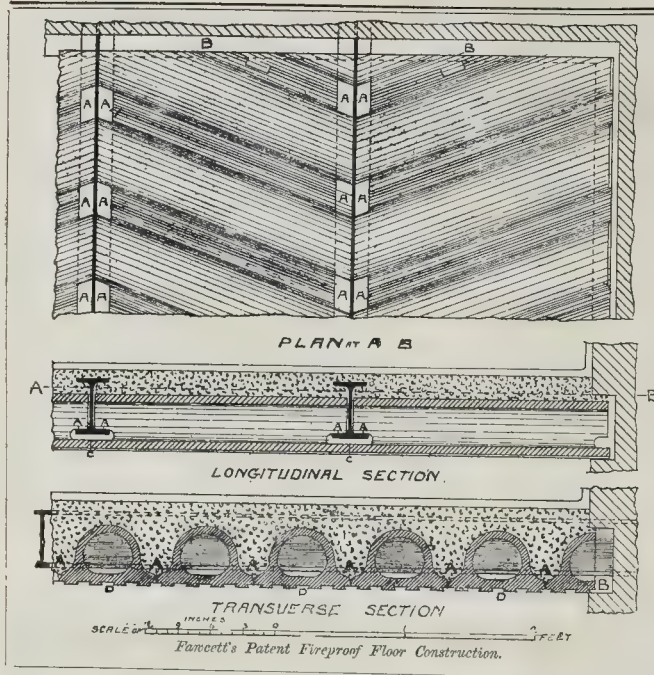
It is possible that this church may be included in this year's programme of the Kent Archaeological Society's Excursion, and if so, further light may be thrown on the question of the purpose this bracket may have served.

P. M. JOHNSTON.

27, Lombard-street, E.C., April 3, 1889.

**The Elbe-Trave Canal.**—Negotiations are in progress between Prussia, Lubek, and Mecklenburg, for the construction of a canal between the Rivers Elbe and Trave. The cost is estimated at 900,000*l.*, of which Prussia contributes one-third.





## FIREPROOF FLOORS.

SIR,—In last week's issue of the *Builder* you have published a paper read by Mr. G. M. Lawford at a meeting of the Society of Engineers, in which several inconsistent statements have been made. In the discussion which followed the reading of the paper, these inconsistencies were, to some extent, rectified; but, as you have not reported the discussion,\* I shall be glad if you will allow me to draw your attention to them. Mr. Lawford said my floor was a modification of the Hornblower floor. There is no resemblance between the two; most of the description he gives of my floor is entirely wrong, and important features are omitted; he omitted to say that he had himself witnessed the tests made with my tubular timbers, for the purpose of comparing the strength with Mr. W. Lindsay's (jun.) tubes; he knew that they had withstood double the load; and also that the concrete in my construction had a direct bearing on the lower flange of the joist, the concrete in itself being strong enough to take the whole of the load and the shock of anything falling on the floor. On the other hand, he knew Mr. Lindsay's tubes, when tested, were not supported as they would be in actual use; that two out of the three tested broke with 11 and 12 cwt. on them; that they had to carry the whole of the load, and receive the shock of anything falling on them, it is evident, withstand.

These misstatements and omissions, if not at once put right, will do me serious injury.

MARK FAWCETT.

\* We have previously described Mr. Fawcett's system of floor construction, but we now append some diagrams in illustration of it. The top one is a plan of two bays, taken a little below the top flanges of the joists. The letters A A show the portions of the lower flanges of the joists where the concrete (shown in transverse section passing down between the tubes) takes its bearing. B B represents a channel in the wall, into which all the tubes open, thus promoting the circulation of air in the hollow spaces of the tubes. C C marks longitudinally the dovetail grooves on the bottom of the tubes, and D D shows these grooves in cross section. They afford a good key for the plaster.—Ed.

**Competition for Public Buildings in Scandinavia.**—The competition for the new Parliament Houses in Stockholm promises to be one of the largest on record, no fewer than 110 architects being now in the field. We referred recently to a competition for a new opera-house at Christiania, and we now learn that the deciding commission, with seven votes to six, have limited the competition to Norwegian architects.

\* The Society of Engineers' meetings are technically private, and we therefore could not report the discussion; the papers are not usually reported in public journals, but an exception was made in this case.—Ed.

## The Student's Column.

## TOWN DRAINAGE.

## XV.—HOUSE DRAINS WITH SHORT BRANCHES.

HOUSE with continuous frontage and no way out at the back, has, on the basement floor, a water-closet and urinal situated at A, and a kitchen sink at B, on the accompanying plan. On the ground-floor there is a lavatory C, and a water-closet D. On the first-floor a bath-room over the lavatory C, and on the second-floor a housemaid's slop-basin and washing-sink at E, and a water-closet over D. The rainwater of the back slope of the roof of the main building F G H I falls towards the vertical pipe K in one corner of the area for light, and that from the other roofs towards the vertical pipe L in another corner. The rainwater from the front slope of the main roof comes down into the front area. The plan of the basement (fig. 1) shows the lines of drainage.

A 6 in. pipe having been laid up from the sewer, a disconnecting trap is set at M, a bed of concrete, 5 ft. by 4 ft., and 1 ft. thick, having first been laid, in which the trap is set, and with which it is surrounded when set level, a brick air-inlet chamber being then built 3 ft. by 2 ft. 3 in., with 9 in. walls, upon the bed of concrete, the upper part of which is formed

a dotted line. A ground-water drain may be unnecessary in some cases, those, that is to say, where it is known that the water in the ground stands permanently at a level lower than the drain can be laid at, having regard to the depth of the drain at its junction with the sewer; but if that is not so, the basement floor may be much improved in dryness by laying such a drain, even though it can be no more than 2 ft. or 3 ft. deep. As, in the line of drain, the trap which cuts off the air of the sewer from that of the house-drain is below the outlet of the ground-water drain, no foul-air can pass into it, and it needs no other trap; it is better, perhaps, without one, for the large grating over the air-chamber serves the purpose of an air inlet to the ground-water drain as well as to the house-drain. If this were not so, and if a trap were placed at the end of the ground-water drain, it would be necessary to form also an air-inlet on its upper side.

The offices on the ground and basement floors are mostly situated at the far side of the area for light; others are in different parts of the house. Those above the basement floor are drained by vertical pipes, which descend inside the house, and are turned through the wall at the bottom into gullies outside, all of which are trapped. Beyond the farthest branch the drain is continued to the point V, where the ventilating-pipe is erected, terminating at a level 5 ft. above the eaves of the main building, assuming

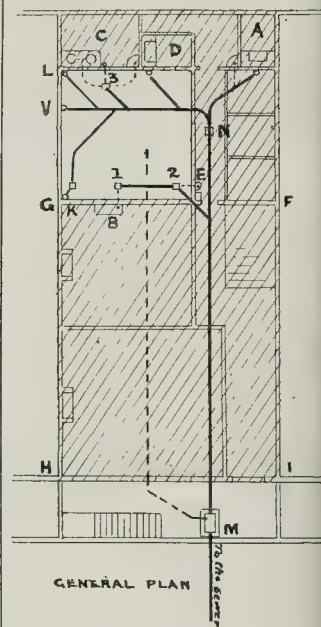
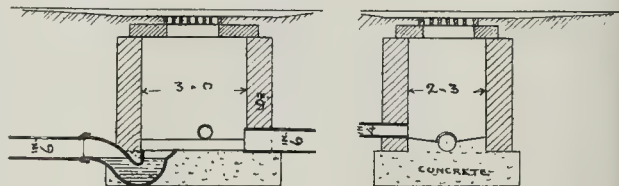


Fig. 1.



## SECTIONS OF THE AIR-INLET CHAMBER

Fig. 2.

within the walls so as to be a continuation of the lower half of the drain-pipe, and rendered with Portland cement and clean sand  $\frac{1}{2}$  in. thick, in the proportions of 1 to 1, the side benches being slightly inclined towards the centre channel and rendered also. At the upper end of the chamber a 6 in. pipe is built into the wall, and in the side wall a 4 in. pipe to receive the ground-water drain, shown on the plan by

that there is no dormer window in the roof. The sink B is drained into the gully 1, the housemaid's sink into the gully 2, the lavatory C into the gully 3. The two soil-pipes of the water-closet A on the basement floor and D on an upper floor, pass straight to the drain, each having a trap at its foot. The waste-pipe of the bath over C is also turned into the gully 3. The rain-water from the vertical pipes K and L



passes through a "shoe," which has an open grating at the surface of the ground on the upper side of the trap.

Thus, all the openings to the drain are trapped, except the one prolongation of the main drain which leads to the ventilating pipe. The air-inlet chamber is shown in fig. 2. It is covered with an iron grating, the clear openings of which are in the aggregate 50 square inches. This is slightly sunk below the general surface, sufficiently to collect to that point the rain-water which comes down from the front slope of the roof over the paved surface of the front area.

At the point N on the main drain a square junction-pipe is turned vertically upwards and closely covered, being thereby made air-tight. Over this a specially-out flagstone, 18 in. square, is bedded, having a small space in its centre sunk to receive a ring, by which it may be raised if at any time it be decided to examine that portion of the drain between M and N. The drain might have been laid nearer the centre of the building, and further from the two walls alongside and near to which it is laid, too near if it could have been avoided; but it may be seen that the water-closet A is in an awkward position: a long branch would have been necessary, without there being adequate means of ventilating it, and it was considered better to approach the situation as nearly as possible, even though the main drain were laid at a greater distance within the house than in the other position it would have been. One main point to be kept in view is to make all branches as short as can be. The rain-water branches need not be so much considered in this respect, although, in the case of a long branch being required, the trap should be placed near the main drain rather than at the foot of the vertical pipe.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

6,645, Ventilating Soil-pipes. A. W. Smith.

According to this invention, special attention is paid to the ventilation of the portion of the pipe between the basin-trap and the upright, or, rather, soil-pipe. An air inlet is placed in the side or other suitable part of the main soil-pipe. In its normal state this closes the soil-pipe, but is operated (by pulling the handle of the water-closet, or automatically) so as to open to admit the passage of the soil, and, at the same time, to close an outlet for the passage of air to the portion of the soil-pipe between the trap and the main soil-pipe. An air inlet is, however, provided to allow the wash of the water to create a current of air, which materially increases the ventilation. Immediately the soil has passed the valve closes, and this prevents any noxious gases from entering one portion of the soil-pipe; while, at the same time, the air outlet is opened and all noxious air is allowed to escape, fresh air being admitted by the inlet.

6,651, Flushing Cisterns. T. W. Twyford.

In order to make these cisterns ornamental as well as useful, instead of constructing them of iron, they are, by this invention, made of wood, metal, or tiles, or entirely of porcelain. The cisterns can be embellished, ornamented, or otherwise treated with artistic effect, to accord, if necessary, with the style of fittings which may be used in other parts. The cisterns are also made of vitreous enamel, with or without raised ornaments.

6,944, Building Blocks. A. von Berkel (Berlin).

By this invention, weather and fireproof blocks are made in a special manner, to obviate the chloride of magnesium used in the manufacture from exuding; and, in order to strengthen the blocks, textile fabrics or reed mats are inserted in the paste before the moulding is done.

7,079, Hinges. R. Beckett.

By adding a contracting additional band or racket at an angle to the usual band hinges, additional support is given, as the lower arm may act as a spur or strut to a pin or hinge at a lower point than that on which the upper band rests, the depth of the spur-band or bracket is regulated by the width and weight of the door it has to carry.

14,173, Window-sashes. W. H. Dawson.

In order to prevent the admission of dust, and the like around the sashes of carriage windows, the sash which is the subject of this patent has a flexible strip, preferably of india-rubber, inserted in its grooves, combined with a using having grooves to receive the strip, the run and depth of each groove being such that the outer edge of the sash-strip therein will closely fit the bottom of the groove, the depth of which is lighter less than the width of the strip, so that the strip has to be bent slightly, and is thus caused to

bear firmly against the bottom of the groove, while the width of the groove is such as to permit the bending of the strip.

18,892, Wash-basins, Baths, &c. W. E. Andrew (New Jersey).

Instead of relying upon a water-seal, which is frequently displaced by gas pressure or syphoning, for the prevention of sewer-gas passing into dwellings, a valve, or gate, is used, which is held in place by the pressure of a spring or weight, so fixed that the pressure of the sewer-gas forces the valve closer. In this way the circumstances, which in other traps conspire to make the seal uncertain and ineffective, are made to aid in making the same secure and effective.

1,874, Revolving Cows, or Hoods. D. G. Hoey.

In order to obviate the spindle on which the cow revolves being forced out of the perpendicular, and to prevent the cow being lifted off by the action of a high wind, a channel, or race, is made around the circumference of the chimney-pot, and the cow fitted with ball-casters to facilitate its action. When the cow, or hood, is required to revolve with special ease and sensitiveness, the race, or course, is made of gun-metal, truly turned and finished, and the balls of the castors, or the balls contained in the cups or the wheels and rollers, are made of phosphor-bronze or specially prepared steel.

### NEW APPLICATIONS FOR PATENTS.

March 25.—5,120, A. Reid, Wood Screws.

March 26.—5,139, A. Raggs, Carpenter's Planes.

5,141, W. Devoll, Syphons for Flushing Water-closets.

5,157, J. James, Manufacture of Cement.

5,163, T. Hilton, Flushing Syphon.

5,175, T. Wintour, Ventilating Apparatus.

5,188, F. Newman, Sash-fasteners.

5,210, F. Trabert, Contrivance for use in the Construction of Seafoils.

March 27.—5,245, B. Pitt, Window-sash Fasteners.

5,255, W. Howlett, Door Fasteners.

5,260, A. Carpenter, Fasteners for Window-sashes.

5,266, H. Knowles, Fastening of Window-sashes, &c.

5,281, P. Smyth, Chimney and Ventilating Cows.

March 28.—5,342, A. Haghe, Facilitating the Raising of Long Ladders.

5,368, H. Kent, Disinfecting Adhesive Paint.

March 29.—5,378, H. Levett, Door Springs and Checks.

5,384, W. Heathman, Band Saw Machines.

5,400, W. Thomas and W. Strong, Window-fastenings.

5,412, T. Ferguson, Ingredients for use as Mortar, Plaster, &c.

March 30.—5,473, J. Clark, Glazier's Hacking Knife.

5,490, T. Taylor, Securing Door-knobs to Spindles.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

1,578, R. Stone, Paint and Pigments.

—1,799, C. Richardson, Device for Preventing Down Draughts.

—2,308, R. Somerville, Dowels.

—2,401, J. Wilks, Press for Moulding Bricks, Tiles, &c.

—2,434, H. Griddle, Mallets.

—2,780, A. Pouton and Others, Artificial Stone.

—2,781, A. Pouton, Artificial Stone.

—3,117, H. Abbott, Securing Window-sashes, &c.

—3,144, G. A. and R. Bell, Bricks.

—3,178, J. Sharples, Flushing Water-closets.

—3,190, G. Dickson and W. Brodie, Traps for Water-closets.

—3,328, W. Rudall and Others, Closing the Openings at the bottom of Doors.

—3,615, J. Adams, Planing-machines.

—3,700, J. Deeley, Flushing Cisterns.

—3,710, J. Howie, Flushing Water-closets.

—3,758, W. Dowland, Plane Iron for Carpenters, Joiners, &c.

—3,851, H. Hallowell, Chimney Top or Cow.

—3,970, E. Matheson, Tiles and Slings same.

—4,005, J. Hall, Norfolk Latches.

—4,079, J. Brundett, Whitewash Brushes.

—4,087, F. Lane, Horizontal Saw Frames.

—4,161, A. Huice, Sash-fasteners.

—4,174, F. Vine, Fastenings for Windows.

—4,269, R. Wyatt, Silent Action Ball Valve.

—4,437, W. Prideaux, Screws.

—4,638, F. Lane, Sawing-machinery.

—4,947, R. Cluais, Drain-pipes, Joints, &c.

### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

7,031, G. Wright, Registered Store Grates.

7,708, L. Goggs and T. Irvine, Metallic Paints.

7,925, H. and H. Holloway, Block Floors or Pavements.

8,164, W. Walker and Others, Raising, Lowering, and Locking Mechanism for Window-sashes.

8,919, C. Gilman, Fireproof Ceilings, &c.

9,920, C. Gilman, Construction of Roofs.

9,921, C. Gilman, Fireproof Floors and Roofs.

9,922, C. Gilman, Fireproofing Wood or Iron Posts, Columns, &c.

9,923, C. Gilman, Fireproof Floors and Ceilings.

9,924, C. Gilman, Outer Walls of Buildings.

9,925, C. Gilman, Roofs or Coverings for Buildings, &c.

9,926, C. Gilman, Pavements or Sidewalks.

9,927, C. Gilman, Columns, Girders, &c., for Building Purposes.

**New Cathedral in Peking.**—The largest Christian cathedral in China was recently formally opened at Peking with great ceremony.

It is 248 ft. long and 108 ft. wide, the style being Gothic. It is built of heavy square bricks, weighing 50 lb. each. All the material was procured in China, the workmen being also Chinese.

## RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.\*

APRIL 2.—By H. J. BROMLEY.  
Hatcham—10, 12, and 14, Manor-grove, ut. 970 yrs., g.r. 20, r. £200 ..... 2,825

By HANNAH BROS.  
Stoke Newington—84, Bayton-rd., ut. 89 yrs., g.r. 26, r. £36 ..... 325

By A. G. THOMSON & CO.  
Wandsworth—34, Colonge-rd., ut. 83 yrs., g.r. 28, r. £40 ..... 300

APRIL 3.—By N. W. ROBINSON.  
Gordon-sq.—No. 55, ut. 34 yrs., g.r. 28, r. £145 p.a. .... 1,620

Hemel Hempstead—"The Lawn," and 18a, Or. 36p ..... 3,610

Haymarket—18, Oxenden-st., f. r. 478 1/2 p.a. .... 1,900

Piccadilly, The Albany—Freehold suite of chambers, fee farm rent £25 p.a. .... 490

The Albany—Freehold suite of chambers, r. £105, fee farm rent £30 p.a. .... 760

Lambeth—344, Kennington-rd., f. with possession. 760

Waterloo-rd., &c.—F.g.r. of £70 p.a., reversion in 32 yrs. to ex. £300 p.a. .... 2,300

APRIL 4.—By WALKER & CO.  
Wimbledon—Freehold building land, 5a, 1r. 5p. .... 7,000

St. Margaret's—19, Claremont-rd., f. r. £42 p.a. .... 560

Strand—No. 295, ut. 60 yrs., g.r. £37, r. £200 p.a. .... 1,160

By NEWSON & HARRIS.  
Westbourne-park—No. 115, f. r. £200 p.a. .... 4,230

Highbury—9, Highbury New-pk., ut. 60 yrs., g.r. £15, r. £100 p.a. .... 860

Euston-road—117, Gower-st., f. r. £283 1/2 p.a. .... 3,450

Finsbury-park—An improved rental of £28 1/2 p.a. .... 810

Horton—38 and 39, Moseley-st., ut. 1, Marston-st., ut. 17 yrs., g.r. £7 1/2 p.a., r. £283 1/2 p.a. .... 135

APRIL 5.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

By BAKER & SONS.  
Hampstead—4, Westbourne-rd., ut. 91 yrs., g.r. £30, r. £180 p.a. .... 1,900

South Kensington—33, Gloucester-rd., ut. 61 yrs., g.r. £15, r. £25 p.a. .... 3,800

Edgware, Strand-rd.—A plot of land, f. r. 60 p.a. .... 80

City—10 and 12, Bishopsgate-avenue, ut. 84 yrs., g.r. £85 each, r. £235 ..... 720

By W. W. JENKINSON.  
Greenwich, Ravensbourne-st.—Coal wharf and premises, ut. 54 yrs., g.r. £27 1/2 p.a., r. £58 p.a. .... 930

By DOLMAN & FRASER.  
Hampstead—22, Fellows-rd., ut. 75 yrs., g.r. £2, with possession ..... 855

Upper Tooting—5, Victoria villas, ut. 77 yrs., g.r. £8 1/2 p.a., r. £80 p.a. .... 525

APRIL 6.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

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APRIL 8.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

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South Kensington—33, Gloucester-rd., ut. 61 yrs., g.r. £15, r. £25 p.a. .... 3,800

Edgware, Strand-rd.—A plot of land, f. r. 60 p.a. .... 80

City—10 and 12, Bishopsgate-avenue, ut. 84 yrs., g.r. £85 each, r. £235 ..... 720

By W. W. JENKINSON.  
Greenwich, Ravensbourne-st.—Coal wharf and premises, ut. 54 yrs., g.r. £27 1/2 p.a., r. £58 p.a. .... 930

By DOLMAN & FRASER.  
Hampstead—22, Fellows-rd., ut. 75 yrs., g.r. £2, with possession ..... 855

Upper Tooting—5, Victoria villas, ut. 77 yrs., g.r. £8 1/2 p.a., r. £80 p.a. .... 525

APRIL 9.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

By BAKER & SONS.  
Hampstead—4, Westbourne-rd., ut. 91 yrs., g.r. £30, r. £180 p.a. .... 1,900

South Kensington—33, Gloucester-rd., ut. 61 yrs., g.r. £15, r. £25 p.a. .... 3,800

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Hampstead—22, Fellows-rd., ut. 75 yrs., g.r. £2, with possession ..... 855

Upper Tooting—5, Victoria villas, ut. 77 yrs., g.r. £8 1/2 p.a., r. £80 p.a. .... 525

APRIL 10.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

By BAKER & SONS.  
Hampstead—4, Westbourne-rd., ut. 91 yrs., g.r. £30, r. £180 p.a. .... 1,900

South Kensington—33, Gloucester-rd., ut. 61 yrs., g.r. £15, r. £25 p.a. .... 3,800

Edgware, Strand-rd.—A plot of land, f. r. 60 p.a. .... 80

City—10 and 12, Bishopsgate-avenue, ut. 84 yrs., g.r. £85 each, r. £235 ..... 720

By W. W. JENKINSON.  
Greenwich, Ravensbourne-st.—Coal wharf and premises, ut. 54 yrs., g.r. £27 1/2 p.a., r. £58 p.a. .... 930

By DOLMAN & FRASER.  
Hampstead—22, Fellows-rd., ut. 75 yrs., g.r. £2, with possession ..... 855

Upper Tooting—5, Victoria villas, ut. 77 yrs., g.r. £8 1/2 p.a., r. £80 p.a. .... 525

APRIL 11.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

By BAKER & SONS.  
Hampstead—4, Westbourne-rd., ut. 91 yrs., g.r. £30, r. £180 p.a. .... 1,900

South Kensington—33, Gloucester-rd., ut. 61 yrs., g.r. £15, r. £25 p.a. .... 3,800

Edgware, Strand-rd.—A plot of land, f. r. 60 p.a. .... 80

City—10 and 12, Bishopsgate-avenue, ut. 84 yrs., g.r. £85 each, r. £235 ..... 720

By W. W. JENKINSON.  
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By DOLMAN & FRASER.  
Hampstead—22, Fellows-rd., ut. 75 yrs., g.r. £2, with possession ..... 855

Upper Tooting—5, Victoria villas, ut. 77 yrs., g.r. £8 1/2 p.a., r. £80 p.a. .... 525

APRIL 12.—By BROAD & WILKINSON.  
Dulwich—167, Lordship-lane, ut. 70 yrs., g.r. £5, r. £42 p.a. .... 375

By BAKER & SONS.  
Hampstead—4, Westbourne-rd., ut. 91 yrs., g.r. £30, r. £180 p.a. .... 1,900

South Kensington—33, Gloucester-rd., ut. 61 yrs., g.r. £15, r. £25 p.a. .... 3,800

Edgware, Strand-rd.—A plot of land, f. r. 60 p.a. .... 80

City—10 and 12, Bishopsgate-avenue, ut. 84 yrs., g.r. £85 each, r. £235 .....



## Miscellaneous.

**Glasgow Architectural Association.**—The usual monthly meeting of this Association was held on the 2nd inst., when a paper on Neo-Greek was read by Mr. John A. Campbell. He briefly sketched the rise of the style in the beginning of the present century; now it may be considered the national French style of architecture. The cause of its origin was the natural revulsion of popular taste from the severe Classicism in all the arts which then prevailed, in conjunction with the enlarged knowledge of ancient architecture gained by the archaeological missions to the East sent out by direction of the first Napoleon. A re-birth or renaissance of Greek refinement of detail in a style quite adaptable to modern requirements was the result. The leaders of the new school were Duc, Labrousse, and their confrères, some of their works being among the very finest of modern architectural efforts, as, for example, the Palais de Justice, Vendôme Column, Library of St. Gervaise, Gare du Nord, and numerous monuments, instances of these widely differing subjects, yet all expressed in a living style which freely meets modern needs with modern materials, while fully conservative of the excellences of the earlier art. Incidentally the essayist took occasion to controvert the unfair comparisons instituted by Mr. William Morris in a recent lecture between Mediaeval architecture and revived Classic. Mr. John Keppie opened a discussion which followed, noting the peculiar excellence of the Neo-Greek style for public buildings rather than domestic. He also considered that, without disparagement to the French for the practical adoption and development of the style, the Italians should be credited with a like sensibility to Greek refinement of detail treated in a free and unconventional manner. The paper was illustrated by numerous photographs and prints, and at its close a hearty vote of thanks was awarded Mr. Campbell.

**Liverpool Engineering Society.**—At the fortnightly meeting of this Society, held on Wednesday, the 3rd inst., at the Royal Institution, Mr. Walter Lang read a paper entitled "Remarks on Steamship Performance Diagrams." He traced the progress of steamship performance records from the old individual registry of each builder to the more generally accepted Admiralty coefficient, whose universal use for single speed trials had all the currency and authority of a standard. The inflexibility of this standard, and its consequent unsuitability for continuous performances, led up to the consideration of Mr. Mansell's elegant diagram, which after careful explanation was shown to be simple and exact for every purpose of investigation. Indicator diagrams were also exhibited illustrating the effect of the form of card upon the correctness of the Admiralty co-efficient, and showing how the efficiency of a vessel could be increased by judicious attention to the setting of the slide-valves. Cases were quoted where the maximum indicated horse-power had been accepted as the sole measure of efficiency, and the results had been hot bearings, broken brasses, and disabled crank-shafts.

**New Terra-Cotta Building in Birmingham.**—The block of buildings, known as "Svan Buildings," situated at the junction of Albert-street and Moor-street, Birmingham, is now completed. The structure consists of large wholesale shops, with warehouses, show-rooms, and basements, and is four stories in height. The style adopted is a free rendering of English Gothic. In the elevation red and buff terra-cotta have been used in combination with other materials for the central gable. The whole of the work has been carried out by Mr. W. H. Chaffer, builder, of Warstone-lane; Mr. J. Statham Davis being the architect.

**The Corinth Canal.**—Owing to financial difficulties, to which we recently referred, the work on the Corinth Canal has been stopped. It is stated that a French firm, having a claim against the canal company for 1,000,000 fr., has seized machinery and material to the value of 700,000 fr.

**Restoration of an Ancient Norse Palace.**—The Norwegian Government have decided upon the restoration of the celebrated historical palace Haco Hall, at Bergen, for a long period the residence of the Norse kings. The structure, which is Early Gothic in style, has for many years been used as a corn warehouse.

**Registration of Plumbers: Meeting at Preston.**—The Mayor of Preston presided, on the 4th inst., at a public meeting held in the local Public Hall to receive a deputation from the West Lancashire, Cheshire, and North Wales District Council, consisting of Dr. Vacher, Medical Officer of Health, Birkenhead; Mr. F. Bage (master plumber), and Mr. T. Anderton (operative), to consider measures for carrying out in Preston and neighbourhood the registration of plumbers upon the system established by the Worshipful Company of Plumbers, London. There was a good attendance of master and operative plumbers, members of the medical profession, architects, and others. The Clerk (Mr. W. R. E. Coles) attended to represent the Plumbers' Company. The Mayor pointed out the advantages which would be likely to result from the adoption of the system in Preston, which, he remarked, was notorious throughout the Kingdom for its high death rate.—Dr. Vacher explained the working of the system in his own district. He said the system was inaugurated by the Plumbers' Company in London in 1886; they had received the cordial support of the plumbers and the public, and the branches had been established throughout the country. The object of the meeting was to establish a branch at Preston.

Mr. F. Bage said that in Liverpool, where he came from, only one-fourth of the plumbers were fit to be certified. Registration would distinguish the "duffers" from the good workmen, and the trade and the public would alike be benefited.

Mr. T. Anderton (Secretary to the Liverpool branch of the United Operative Plumbers' Association of Great Britain and Ireland) said that, speaking as a plumber of twenty-five years' experience, he considered the work done by some men employed as plumbers was a disgrace to the trade.—Dr. Rigby moved a formal resolution to the effect that a local committee be formed to act in conjunction with the District Council for West Lancashire, Cheshire, and North Wales, to carry out the Registration system in Preston and neighbourhood. In his professional capacity he frequently had to deal with cases which were directly traceable to bad plumbing.—The resolution was supported by members of the trade and others, and carried.—The meeting then elected a local committee composed of three master plumbers, three operatives, and the following public representatives:—Dr. Brown, Mr. W. Ascroft, President of the Technical School, and Mr. P. S. Park.

**Edison's Newest Photograph.**—Since the first introduction of the photograph, many improvements have been made in its construction. For ten years it was allowed by Mr. Edison to remain in a very crude condition, and it was not until about three years ago that he really set himself to work to make it something more than a mere scientific toy. The outcome of his recent labours has only just arrived in England, and is now on exhibition at the Gainsborough Gallery, Old Bond-street, under the direction of Colonel Gouraud. At a "private view," which was given on Saturday, records of band and solo performances, the chorine of a song, and speeches by Colonel Gouraud and the Rev. Dr. Sabonje (in several languages) were satisfactorily reproduced. The exhibition, which will remain open for a considerable time, is bung with pictorial and other illustrations of the many practical uses of the instrument, and in addition to recitals of its numerous records, it is intended to give occasional explanatory lectures on the subject.

**Civil and Mechanical Engineers' Society.**—A paper was read at a meeting of this society on April 3, at the Westminster Palace Hotel, the President (Mr. Middleton) in the chair, by Mr. James Bateman, C.E., on "The Roadstones of Somerset and Wilts." The author spoke of the superiority of the wear of hand-broken stone, and expressed regret that the price paid for hand labour was so inadequate that it was difficult to obtain men to undertake this work in time for autumn repairs. He gave a description of the characteristics of the different stones in that district, and recommended the use of high-class materials, such as the Basalt of Cranmore, which can be delivered in London at the cost of 9s. 3d. per ton.

**The Hampstead Public Baths.**—In reference to these Baths (illustrated in our last issue), Messrs. John Allen & Sons, of Kilburn, ask us to mention that they were the contractors for the whole of the work, which amounted to about 17,500l., and was executed in seven months.

**The English Iron Trade.**—The English iron trade is somewhat quieter, at least so far as pig-iron is in question; but the tone of the market continues excellent. The favourable nature of the Board of Trade returns for March no doubt strengthens the confidence of makers, while the undiminished activity in the finished iron and steel branches prevents any reaction setting in. Prices have not essentially changed during the week, and Bessemer pig has even gained 6d. a ton. Although the Glasgow warrant market has been drooping, Scotch makers, owing to a well-sustained consumption, have been able to advance some brands another 6d. a ton. Staffordshire common bars have gone up 2s. 6d. a ton, and there is considerable inquiry in manufactured iron generally, in anticipation of a further upward movement. Tinplates are reported much stronger, as buyers are beginning to purchase in earnest. Steel, for which there is just as much pressure as ever, is still on the rise. Nearly 5s. has been added to the value of steel rails; wire rods are 2s. 6d. a ton dearer, and other descriptions of steel also show fractional advances. There is, as yet, no lack of orders for new ships, and engineers continue fully employed.—Iron.

**A Check on the Architect.**—In a recent number of a New York contemporary, *Buildings*, it is stated that "a novel inquiry was made this week by a large business house, who are now deciding on plans for a new office building, about to erect. The inquiry was for a superintendent and inspector of materials; in other words, a clerk of the works—their idea being to make the selection themselves. It was suggested that the architect was the proper person to fill the position, and would be able to secure the services of a competent man. But this it seems was not at all in accordance with the ideas of the inquirers. They wanted a man as a sort of check on the architect. While we do not wish to be understood as criticising at all the gentlemen in question, or referring to them either publicly or privately in this matter, yet learning of the inquiry and knowing of their intelligence and worldly wisdom, we cannot refrain from calling attention to the question as showing how little the position of the architect is understood and appreciated even among men of liberal views and large experience in business. Men recognise that they must place confidence in their lawyer, their doctor, and in many other business relations, but too often forget that the architect should be a trusted professional adviser. It may be well enough to get a superintendent to watch the architect, but one naturally asks who is to watch the superintendent."

**Competition: Schools, Huddersfield.**—In response to the Building Committee's invitation, thirty-eight sets of designs were submitted in the competition for Trinity Wesleyan Sunday Schools, Huddersfield. Of these, four, bearing the mottoes "Ready," "Utile Dulci," "Maltese Cross," and "Lux," were set aside for closer comparison, and ultimately the design bearing the motto "Ready" was selected. This proved to be the design of Mr. F. Bettany, architect, Hanley.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                     |             | £. | s. | d. | £. | s. | d. |
|---------------------------------------------|-------------|----|----|----|----|----|----|
| Greenheart, B.G.                            | ton         | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                                  | do          | 10 | 0  | 0  | 13 | 0  | 0  |
| Squid, U.S.                                 | foot cube   | 0  | 2  | 3  | 0  | 3  | 0  |
| Ash, Canada                                 | load        | 3  | 10 | 0  | 5  | 0  | 0  |
| Birch                                       | do          | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm                                         | do          | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantisc, No.                           | do          | 3  | 0  | 0  | 4  | 0  | 0  |
| Oak                                         | do          | 2  | 10 | 0  | 4  | 10 | 0  |
| Canada                                      | do          | 5  | 10 | 0  | 7  | 10 | 0  |
| Pine, Canada                                | do          | 7  | 10 | 0  | 4  | 0  | 0  |
| do                                          | yellow      | 3  | 10 | 0  | 5  | 10 | 0  |
| Lath, Dantisc                               | 100 lb      | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg                              | do          | 5  | 0  | 0  | 6  | 10 | 0  |
| Waincoat, Riga, &c.                         | log         | 2  | 15 | 0  | 4  | 5  | 0  |
| Odena, crown                                | do          | 0  | 0  | 0  | 0  | 0  | 0  |
| Deal, Finland, 2nd and 1st                  | std. 100    | 9  | 10 | 0  | 11 | 0  | 0  |
| Riga                                        | do          | 8  | 0  | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow                  | do          | 11 | 10 | 0  | 15 | 0  | 0  |
| do                                          | 2nd         | 10 | 0  | 0  | 11 | 0  | 0  |
| do                                          | white       | 8  | 10 | 0  | 10 | 10 | 0  |
| Swedish                                     | do          | 9  | 0  | 0  | 16 | 0  | 0  |
| White Sea                                   | do          | 9  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                           | do          | 15 | 0  | 0  | 26 | 10 | 0  |
| do                                          | 2nd         | 11 | 0  | 0  | 17 | 10 | 0  |
| do                                          | 3rd         | 8  | 0  | 0  | 10 | 0  | 0  |
| do                                          | Spruce, 1st | 9  | 10 | 0  | 11 | 0  | 0  |
| do                                          | 2nd and 3rd | 7  | 10 | 0  | 9  | 10 | 0  |
| New Brunswick, &c.                          | do          | 8  | 15 | 0  | 13 | 0  | 0  |
| Battens, all kinds                          | do          | 6  | 10 | 0  | 20 | 0  | 0  |
| Flooring Boards, sq. 1 in., prepared, First | do          | 0  | 11 | 0  | 0  | 14 | 0  |
| Second                                      | do          | 0  | 8  | 0  | 0  | 10 | 0  |
| Other qualities                             | do          | 0  | 5  | 0  | 0  | 7  | 0  |



| TIMBER (continued).              |          |          |  | METALS (continued).         |          |          |  |
|----------------------------------|----------|----------|--|-----------------------------|----------|----------|--|
|                                  | £. s. d. | £. s. d. |  |                             | £. s. d. | £. s. d. |  |
| dar, Cuba.....foot               | 0 0 44   | 0 0 44   |  | LEAD—Pig, Spanish.....ton   | 0 0 0    | 0 0 0    |  |
| Andorra, &c.....                 | 0 0 4    | 0 0 4    |  | English, common brands..... | 0 0 0    | 0 0 0    |  |
| hogany, Cuba.....                | 0 0 42   | 0 0 42   |  | Sheet, English.....         | 13 10 0  | 14 0 0   |  |
| St. Domingo, cargo average       | 0 0 42   | 0 0 42   |  | SRETTA.....                 |          |          |  |
| Mexican.....                     | 0 0 42   | 0 0 42   |  | Russian, special.....ton    | 16 17 6  | 17 0 0   |  |
| Robisco.....                     | 0 0 42   | 0 0 42   |  | Ordinary brands.....        | 16 15 0  | 16 17 6  |  |
| India.....                       | 0 0 42   | 0 0 42   |  | Tin—                        |          |          |  |
| z, Turkey.....                   | 15 0 0   | 20 0 0   |  | Swiss.....                  | 93 10 0  | 0 0 0    |  |
| Bahia.....                       | 14 0 0   | 18 0 0   |  | Australian.....             | 94 10 0  | 0 0 0    |  |
| in, St. Domingo.....foot         | 0 0 8    | 0 1 3    |  | English Ingots.....         | 96 10 0  | 0 0 0    |  |
| Sorto Rico.....                  | 0 0 8    | 0 1 3    |  | ZINC—English sheet.....ton  | 21 0 0   | 22 0 0   |  |
| about, Italian.....              | 0 0 44   | 0 0 44   |  | OILS.                       |          |          |  |
| METALS.                          |          |          |  | Linseed.....ton             | 18 15 0  | 19 0 0   |  |
| Bar, Welsh, in London, ton       | 5 5 0    | 5 10 0   |  | Cocunut, Cochiti.....       | 27 0 0   | 23 0 0   |  |
| at works in Wales.....           | 4 15 0   | 5 0 0    |  | Ceylon.....                 | 25 10 0  | 0 0 0    |  |
| Saffordshire, in London.....     | 5 10 0   | 6 10 0   |  | Palm, Lagos.....            | 25 10 0  | 0 0 0    |  |
| IRON.                            |          |          |  | Rapeseed, English pale..... | 23 0 0   | 23 5 0   |  |
| British, cake and ingot..... ton | 45 0 0   | 46 0 0   |  | Cottonseed, refined.....    | 24 10 0  | 25 10 0  |  |
| Test selected.....               | 47 0 0   | 48 0 0   |  | Tallow and Oleine.....      | 19 0 0   | 45 0 0   |  |
| Sheet, strong.....               | 52 0 0   | 0 0 0    |  | Lubricating, U.S.....       | 5 0 0    | 6 0 0    |  |
| Australian.....                  | 0 0 0    | 0 0 0    |  | do. refined.....            | 7 0 0    | 12 0 0   |  |
| Bill, bars.....                  | 40 10 0  | 0 0 0    |  | TAB—Stockholm.....barrel    | 1 2 0    | 1 2 6    |  |
| Low METAL.....lb.                | 0 0 64   | 0 0 64   |  | Archangel.....              | 0 14 6   | 0 14 9   |  |

|                                                                                                                         |          |
|-------------------------------------------------------------------------------------------------------------------------|----------|
| LONDON.—For erecting boundary-wall in the rear of St. John's-road Workhouse, for the Guardians of St. Mary, Islington:— |          |
| Lowe & Son.....                                                                                                         | £265 0 0 |
| Ball.....                                                                                                               | 440 0 0  |
| Brown & Swearing.....                                                                                                   | 388 10 0 |
| McFarlane.....                                                                                                          | 388 0 0  |
| Lark & Son.....                                                                                                         | 397 0 0  |
| Meekham.....                                                                                                            | 387 17 6 |
| Ward & Lambie.....                                                                                                      | 377 0 0  |
| Savage.....                                                                                                             | 370 0 0  |
| Mattock Bros.....                                                                                                       | 363 0 0  |
| Haynes.....                                                                                                             | 359 0 0  |
| Stevens Bros.....                                                                                                       | 357 0 0  |
| Langham.....                                                                                                            | 355 0 0  |
| Doubleday.....                                                                                                          | 350 0 0  |
| Dearing & Son.....                                                                                                      | 347 0 0  |
| Wilkinson (accepted).....                                                                                               | 314 0 0  |

|                                                                                                                                                                                  |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| LONDON.—For the completion of four houses in Streetley-road, Buckley-road, Waterloo Estate, Kilburn, under the supervision of Mr. Ernest Owers, surveyor, West Hampstead, N.W.:— |          |
| Rathbone.....                                                                                                                                                                    | £485 0 0 |
| Prestley & Clark.....                                                                                                                                                            | 476 0 0  |
| J. Gibb.....                                                                                                                                                                     | 380 0 0  |
| Ball (accepted).....                                                                                                                                                             | 320 0 0  |

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.  
Epitome of Advertisements in this Number.

| COMPETITIONS.                      |                           |                    |                          |       |
|------------------------------------|---------------------------|--------------------|--------------------------|-------|
| Nature of Work.                    | By whom Required.         | Premium.           | Designs to be delivered. | Page. |
| Market Buildings.....              | Swansea Corporation.....  | 50 Guineas.....    | June 8.....              | ii.   |
| Plan for Prevention of Floods..... | Taunton Town Council..... | 100l. and 50l..... | Not stated.....          | x.    |

| CONTRACTS.                                   |                            |                                   |                          |       |
|----------------------------------------------|----------------------------|-----------------------------------|--------------------------|-------|
| Nature of Work, or Materials.                | By whom Required.          | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
| Mettery Buildings.....                       | Plumstead Burial Bd.       | H. H. Church.....                 | April 16th.....          | x.    |
| Painting, &c.....                            | Lambeth Guardians.....     | Official.....                     | April 17th.....          | x.    |
| Painting and Plastering Buildings.....       | Midland Railway Co.....    | A. A. Langley.....                | do.....                  | ii.   |
| Construction of Infirmary, &c.....           | Dartford Union.....        | G. H. Tait.....                   | April 19th.....          | ii.   |
| Roofs and Materials, Shoebricks.....         | War Department.....        | J. Lovregrove.....                | April 22nd.....          | x.    |
| Whole Covers and Gully Gratings.....         | Hackney Bd. of Works.....  | do.....                           | do.....                  | x.    |
| Iron Granite.....                            | Com. of H. M. Works.....   | Official.....                     | do.....                  | x.    |
| London to Devonport Post Office.....         | Leicester Corporation..... | J. Gordon.....                    | April 25th.....          | x.    |
| Construction of New M. in Sewers.....        | St. Mary (Islington).....  | do.....                           | do.....                  | x.    |
| London Granite, Kentish Rag, and Flints..... | Guardians.....             | W. Smith.....                     | do.....                  | ii.   |
| Painting Works.....                          | West London Sch. Dist..... | A. Brooker.....                   | do.....                  | x.    |
| Gas.....                                     | Bristol Dock Co.....       | Official.....                     | April 26th.....          | x.    |
| Gas Engine.....                              | Hornsey Local Board.....   | J. W. Girdlestone.....            | April 28th.....          | x.    |
| Post Office, Birmingham.....                 | Great Western Ry. Co.....  | do.....                           | do.....                  | ii.   |
| Shed, West London.....                       | Comms. of Sowers.....      | do.....                           | do.....                  | ii.   |
| Sewers, &c.....                              | Corporation of London..... | B. Wylie Barry.....               | May 10th.....            | x.    |
| Wrought-ironwork, &c., Tower Bridge.....     | Swindon New T. L. B.....   | do.....                           | May 11th.....            | x.    |
| Qual Repairs to Buildings and Furniture..... | School Bd. for London..... | Official.....                     | Not stated.....          | x.    |
| Construction of Works.....                   | do.....                    | do.....                           | do.....                  | x.    |
| Hot-water Apparatus.....                     | do.....                    | do.....                           | do.....                  | x.    |

| PUBLIC APPOINTMENTS.                               |                        |                   |                        |       |
|----------------------------------------------------|------------------------|-------------------|------------------------|-------|
| Nature of Appointment.                             | By whom Advertised.    | Salary.           | Applications to be in. | Page. |
| Assistant Surveyor and Inspector of Nuisances..... | South Hornsey Loc. Bd. | Not stated.....   | April 22nd.....        | rv.   |
| Assistant in Engineer's and Surveyor's Office..... | Edmonton Local Board   | 50l. and 40l..... | April 23rd.....        | rv.   |
| Assistant Clerk.....                               | Civil Service Commis.  | Not stated.....   | May 2nd.....           | rv.   |

**TENDERS.**  
\* Next Week, communications for insertion under heading must reach us not later than 12 Noon on Tuesday, as we go to Press a day earlier than usual.

|                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UDENSHAW.—For lagging and kerbing Audenshaw, for the Local Board of Audenshaw, Mr. J. H. Ton, surveyor, Warrington-street, Ashton-under-Lyne, under-<br>Henry Kinder, Hooley-hill (accepted at per schedule of prices).<br>[Nine tenders were received.] | ENFIELD.—For proposed alterations and fittings at the "Greyhound," Enfield Lock, for Mr. H. Trask. Mr. W. West, architect.<br>John Brooks (late Brooks and Meader) (accepted).....£390 0 0 | GREAT THORLOW (Stifford).—For the erection of a pair of cottages, for the Right Hon. W. H. Smith, M.P. Mr. C. P. Ayres, 52 High-street, Watford, architect:—<br>Brown, Haverhill.....£470 0 0<br>Arber, Haverhill.....460 0 0<br>Mason, Haverhill (accepted).....455 0 0 | HILLINGDON.—For the erection of a house at Merriam's Farm, Hillingdon, for Mr. John Gregory. Messrs. New & Son, architects:—<br>F. Mark.....£2,166 0 0<br>Fasten & Son.....1,884 0 0<br>Oldrey & Co.....1,977 0 0<br>T. Nye.....1,989 0 0<br>Brown, Haverhill.....1,937 0 0<br>Penny & Co.....1,758 0 0 | LEYTON (Essex).—For additions and alterations to the Leyton Town-hall, Leyton, Essex, for the Local Board of Health. Mr. Wm. Dawson, Surveyor:—<br>Gregor.....£729 0 0<br>Shurmer.....863 0 0<br>Sayer.....885 0 0<br>Corbush.....889 0 0<br>W. Watson, Ilford.....650 0 0 | LONDON.—For warehouse, Baches-street, N., for Messrs. Unifreille & Son. Mr. Fredk. Borcham, architect:—<br>W. R. King.....£2,641 0 0<br>Gould & Brand.....2,458 0 0<br>Woodward & Co.....2,440 0 0<br>Barrett & Power.....2,375 0 0<br>W. Goodman.....2,333 0 0<br>J. Chasman & Sons.....2,334 0 0<br>Jervis Smith.....2,198 0 0<br>J. Allen & Sons.....2,078 0 0 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                 |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For alteration, &c., to "Plough" public-house, Rupert-street, Shaftesbury-avenue, for Messrs. Lascelles & Tickner. Messrs. Bird & Walters, architects:— |            |
| Gentry.....                                                                                                                                                     | £3,229 0 0 |
| Simpson & Son.....                                                                                                                                              | 3,217 0 0  |
| Laurence.....                                                                                                                                                   | 3,098 0 0  |
| Wall Bros.....                                                                                                                                                  | 3,043 0 0  |
| Toms.....                                                                                                                                                       | 2,673 0 0  |
| Chappell.....                                                                                                                                                   | 2,580 0 0  |
| Williams & Son.....                                                                                                                                             | 2,315 0 0  |
| J. Allen & Sons (accepted).....                                                                                                                                 | 2,765 0 0  |

|                                                                                                                                |          |
|--------------------------------------------------------------------------------------------------------------------------------|----------|
| LONDON.—For the Commissioners of Libraries and Museums at Ravenscourt Park Mason, Hammer-smith. Mr. E. F. Roberts, architect:— |          |
| Adams & Son.....                                                                                                               | £239 0 0 |
| A. R. Flew & Co.....                                                                                                           | 419 0 0  |
| D. & J. Prince.....                                                                                                            | 395 0 0  |
| W. Burgess.....                                                                                                                | 383 10 0 |
| W. Knight.....                                                                                                                 | 392 0 0  |
| W. Blackburn.....                                                                                                              | 350 0 0  |
| Tones & Scott.....                                                                                                             | 310 0 0  |
| Scharien & Co.....                                                                                                             | 328 0 0  |
| J. Haines.....                                                                                                                 | 323 0 0  |
| C. Reading.....                                                                                                                | 323 0 0  |
| H. Haynes.....                                                                                                                 | 315 0 0  |
| T. Bendon.....                                                                                                                 | 288 11 0 |
| Doubleday & Son.....                                                                                                           | 289 0 0  |
| T. Hewitt.....                                                                                                                 | 281 14 0 |
| F. Henderson.....                                                                                                              | 275 0 0  |
| A. Bruckell.....                                                                                                               | 273 0 0  |
| T. J. & A. Kinton.....                                                                                                         | 260 0 0  |
| Cutting Brothers.....                                                                                                          | 254 10 0 |
| J. J. Richards.....                                                                                                            | 230 0 0  |

|                                                                                               |          |
|-----------------------------------------------------------------------------------------------|----------|
| LONDON.—For alterations and additions to No. 50, High-street, Battersea, for Mr. A. Furrall:— |          |
| Lidstone, Holloway.....                                                                       | £293 0 0 |
| Stilling, Bethnal Green.....                                                                  | 491 6 0  |
| Picken, Chelsea.....                                                                          | 489 0 0  |

|                                                                                                                     |            |
|---------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For erecting the Sir Wm. McArthur Memorial Wesleyan Chapel, Bassen Park, W., Mr. Fred. Borcham, architect:— |            |
| Messrs. J. Chessum & Sons.....                                                                                      | £4,000 0 0 |
| * Accepted.                                                                                                         |            |

|                                                                                                                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For rebuilding the "Old King's Head" public-house, Bear-street, Leicester-square (including party walls if necessary), for Mr. King. Mr. R. B. Willey, architect, 68, Ludgate-hill, E.C.4:— |            |
| Clark & Bracey, London.....                                                                                                                                                                         | £2,738 0 0 |
| Burman & Sons, London.....                                                                                                                                                                          | 2,237 0 0  |
| William Rowe, London.....                                                                                                                                                                           | 2,100 0 0  |
| D. Charters, London.....                                                                                                                                                                            | 2,048 0 0  |
| Thomas Nye, Ealing.....                                                                                                                                                                             | 2,085 0 0  |
| Martin Wells & Co., Aldershot.....                                                                                                                                                                  | 1,865 0 0  |
| * Accepted.                                                                                                                                                                                         |            |

|                                                                                                                                                         |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—Alterations and additions to the National Bakery Company's premises, Brewery-road, N. Mr. Frederick Wallen, 98, Gower-street, W.C., architect:— |            |
| W. Goodman.....                                                                                                                                         | £1,569 0 0 |
| E. A. Roome.....                                                                                                                                        | 1,568 0 0  |
| Mattock Bros.....                                                                                                                                       | 1,377 0 0  |

|                                                                                                                                                                                                                          |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For additions and alterations to house in Holland-park-terrace, W., for Lieutenant G. Mansfield Smith-Cumming, Messrs. Higgs & Rudkin, architects, No. 44, Bedford-row. Quantities supplied by Mr. J. Rookwood:— |            |
| Macey & Sons.....                                                                                                                                                                                                        | £1,200 0 0 |
| H. L. Holloway.....                                                                                                                                                                                                      | 1,135 0 0  |
| Kilby & Gayford (Worship-street).....                                                                                                                                                                                    | 1,134 0 0  |
| [Surveyor's estimate, £1,200.]                                                                                                                                                                                           |            |

|                                                                                                      |            |
|------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For the erection of Abney Mission Hall, Stoke Newington, N. Mr. Walter Whitcomb, architect:— |            |
| Dove Bros.....                                                                                       | £1,995 0 0 |
| Lawrence.....                                                                                        | 1,416 0 0  |
| Chasman.....                                                                                         | 1,340 0 0  |
| Fredk. Tarrant.....                                                                                  | 1,285 0 0  |
| Wm. Dabbs.....                                                                                       | 1,268 0 0  |
| Coldwells.....                                                                                       | 1,240 0 0  |

|                                                                                                                             |  |
|-----------------------------------------------------------------------------------------------------------------------------|--|
| LONDON.—No. 4 Biennial Contract for repairs, &c., to the various barracks in the London District, for H.M. War Department:— |  |
| Buckeridge, Somerset Works, High-street, Kensington, W.                                                                     |  |
| Accepted at per schedule of prices.                                                                                         |  |

|                                                                                                                                                             |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| LONDON.—For alterations and repairs at No. 331, King-street West, Battersea, for Mr. Stubbs. Mr. Francis A. R. Willey, architect, 68, Ludgate-hill, E.C.4:— |           |
| T. Brantwaite, jun.,                                                                                                                                        | £222 17 6 |
| A. Ward.....                                                                                                                                                | 217 5 0   |
| A. Lincoln (accepted).....                                                                                                                                  | 181 10 0  |

**NEWPORT (Mon.).**—For the erection of three small houses on the Llanover Estate, at Newbridge, for Messrs. Griffiths, Jones, & Beach. E. A. Lansdowne, architect.—C. Morgan, Newbridge (accepted)..... £750 0 0

**NEWPORT (Mon.).**—For new bed-rooms, Morrish's Temperance Hotel, E. A. Lansdowne, architect:—  
T. Prosser, Newport..... £200 0 0  
Jonkins, Newport..... 186 0 0  
Lock, Newport..... 185 0 0  
Wm. Biggs (accepted)..... 182 10 0

**SHEFFIELD.**—For sewerage, paving, &c., in Botham-street, Cycloped-street, Ludlow-street, Margate-street, Ruthin-street, Bromley-street, and Elton-street, for the Highway Committee. Mr. C. F. Wile, C.E., Borough Surveyor:—

|                                        |            |
|----------------------------------------|------------|
| H. Hobson, Sheffield                   | £3,281 0 3 |
| Scott Bros., Mashro'                   | 3,187 16 8 |
| Reuben Clark, Sheffield                | 2,788 13 6 |
| John Hill, Sheffield                   | 2,679 7 8  |
| Joseph Andrews, Sheffield              | 2,296 13 8 |
| J. Kyme, Sheffield (Elton-street only) | 599 18 8   |

Accepted.

**SLOUGH (Bucks.).**—For the erection of the first portion of the Langley New Town Mission Church, for the Trustees. Mr. Albert E. Fridmore, architect, 2, Broad-street-buildings, London:—

|                              | Turret. | Credit | Materials. |
|------------------------------|---------|--------|------------|
| Brown, Son, & Co., Battersea | £725 0  | £27 0  | £170 0     |
| Green, Colnbrook             | 645 0   | 63 10  | 180 0      |
| Yard, Uxbridge               | 618 0   | 79 0   | 190 0      |
| Deverill, Slough             | 535 0   | 24 0   | 148 0      |
| Crowhurst, Slough            | 500 0   | 85 12  | 160 0      |
| Higgs & Son, Reading         | 556 0   | 105 0  | 57 0       |
| Martin, Maidenhead           | 553 19  | 75 0   | 149 0      |
| Jarvis, Banbury              | 498 0   | 47 0   | 180 0      |
| Bowyer, Slough               | 514 0   | 65 10  | 235 0      |
| Billings, Hounslow           | 483 7   | 75 0   | 113 8      |

Accepted for whole of works.

**SOUTHAMPTON.**—For erecting new business premises, Portwood-road, Southampton, for Messrs. Lisle Brothers. Mr. H. J. Weston, Assoc. M. Inst. C.E., architect. Quantities by the architect:—

|                      |          |
|----------------------|----------|
| G. Smith & Son       | £690 0 0 |
| G. B. Jordan         | 498 0 0  |
| W. Harvey (accepted) | 480 0 0  |

[All of Southampton.]

**STRAITFORD.**—For reinstatement of charcoal factory for Messrs. Jared T. Hunt & Son, Limited. Messrs. Waring & Nicholson, architects. Quantities supplied:—

|                          |          |
|--------------------------|----------|
| A. Reed                  | £207 0 0 |
| J. Fearle & Son          | 757 0 0  |
| W. Greger                | 694 0 0  |
| Boulter & Lee (accepted) | 670 0 0  |

**WORKING.**—For erecting cottage, Oakfield-road, Working (exclusive of joiners' work). Mr. W. I. Chambers, architect:—

|                        |          |
|------------------------|----------|
| A. A. Gale, Working    | £250 0 0 |
| Thos. Millard, Working | 291 15 0 |
| C. E. Ham, Working     | 277 10 0 |
| C. Filleld, Working    | 220 0 0  |

**WOOLWICH.**—For alterations and additions to business premises, Nos. 117, 118, and 119, High-street. Mr. H. H. Church, architect, William-street, Woolwich:—

|                            |            |
|----------------------------|------------|
| Dove Brothers              | £2,880 0 0 |
| Cox Brothers               | 2,588 0 0  |
| Clements                   | 2,570 0 0  |
| Kirk & Randall             | 2,698 0 0  |
| Proctor                    | 2,650 0 0  |
| Chapman                    | 2,595 0 0  |
| Jerrard                    | 2,589 0 0  |
| Kemp                       | 2,397 0 0  |
| Holloway, H. L. (accepted) | 2,387 0 0  |
| Covill                     | 2,100 0 0  |

\*. Next Week, communications for insertion under this heading must reach us not later than 12 Noon on Wednesday, as we go to Press a day earlier than usual.

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### TO CORRESPONDENTS.

C. P.—P. R. W. (received).—J. B. L. (not within our province).—  
"A Reader of the Builder" (please send name and address: not for publication).—H. (next week).—H. (next week).—J. W. T. (next week).—A. G. (we cannot report such cases).—F. Bros.—W. J.—R. & Co. (noticed last week).—W. & G.—R. & M.—J. B. D.—  
"An On-looker" (too late).—C. H. B. (next week).  
All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the writer, and necessary for publication. We are compelled to decline pointing out books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. Letters or communications beyond mere news-items which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

### PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER, LONDON."

**GOOD FRIDAY.**—THE BUILDER for the Week ending THURSDAY, the 12th. Advertisements for insertion in that issue must therefore reach the Office before THREE P.M. on WEDNESDAY, the 11th. Alterations in Standing Advertisements, or ORDERS to DISCONTINUE the same, must reach the Office by TEN O'CLOCK on TUESDAY Morning.

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Addressed to No. 46, Catherine-street, W.C.  
Advertisements for the current week's issue must reach the Office before THREE O'CLOCK P.M. on WEDNESDAY, and for the front Page by the same hour on TUESDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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ESTIMATES GIVEN ON APPLICATION.

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**Asphalte.**—The Seyssel and Metallic Laid Asphalte Company (Mr. H. Glenn), Office, A. Poiry, E.C.—The best and cheapest material for damp courses, railway arches, warehouses, floors, flat roofs, stables, cow-sheds, and mill rooms, granaries, tin-rooms, and terraces. [Adv.]

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6 and 8, Hatton Garden.

**GLASGOW:**  
Petershill-road.



# The Builder.

VOL. LVI. No. 2411.

SATURDAY, APRIL 20, 1889.

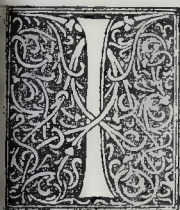
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### The Modern Hôtel de Ville, Paris.



IN the *Builder* of January 26 of this year we gave a view of the old Hôtel de Ville of Paris, with a sketch of its history. As a complement to this it may be of interest to sum up here, at a time when so much attention is being directed to Paris and her great Exhibition, the history of the modern Hôtel de Ville, which, though the actual building has now been for some time completed, is only just entering on the final stage of decorative embellishment which will crown the work.

On the morrow, so to speak, of the Commune riots, when the ruins of the burned buildings were still smoking, one of the first cares of the municipal administration was the rebuilding of the Town Hall. M. Léon Say, then Prefect of the Seine, submitted the question to the Conseil d'Architecture as well as to the Commission des Beaux Arts, who both pronounced in favour of the reconstruction of the monument as it had existed before the fire, but expressing the opinion that the principal façade, being such a remarkable example of the French architecture of the Renaissance, should be placed more in relief than it had been in the supplementary work of Rodde and Lesueur. The two Commissions proposed various other modifications, consisting principally in the enlargement of the angle pavilions and of the lateral façades towards the streets, in view of a better provision for the administrative organisation. The opinions of the Commissions were conveyed to the Municipal Council, which however took another view, and pronounced in favour of a competition for the design of an entirely new Hôtel; and the drawing up of the programme gave rise to a good deal of animated discussion.

The competition was, however, opened on July 23, 1872. The conditions stipulated formally for the exact reproduction of the ancient façade "du Boccador," on the axis of the Avenue Victoria, and for utilisation of the existing remains as far as possible. On Jan. 31, 1873, the limit fixed for sending in drawings, sixty-six designs had been deposited in the Palais d'Industrie. Among the principal competitors we may recall the names of MM. Ballu, Deperthes, Baltard, de Baudot,

Chippiez, Crépinet, Davioud, Escalier, Formigé, Guadet, Lheureux, Magne père et fils, Moyaux, Roguet, Rouyer, and Vaudremar. In the course of February a jury of thirty persons had selected thirty-eight designs as deserving of further consideration. A second examination threw out eighteen of these, limiting the competing designs to twenty, and after another long and careful examination, the final awards were given in the following order:—

1. MM. Ballu and Deperthes, who received the commission for the building.
2. M. Rouyer, who received a premium of 15,000 francs.
3. M. Davioud 12,000 fr.
4. M. Vaudremar 10,000 fr.
5. M. Magne père 8,000 fr.
6. MM. Moyaux and Lafforgue 5,000 fr.
7. MM. Roguet, Menjot de Dammartin, and Baltard, who were judged equal, and each received a premium of 2,500 francs.

MM. Ballu and Deperthes were therefore formally charged with the rebuilding of the ancient "Maison de Ville," the remains of which, disintegrated as they were by the solvent action of petroleum, were eventually condemned as incapable of utilisation, and entirely removed. The demolition of these was commenced in 1873, and the works of the new building were carried on uninterruptedly from February 16, 1864, to the month of July, 1882, when M. Jules Grévy, then President of the Republic, inaugurated the Hôtel de Ville with a great banquet to 500 guests, to which were invited the representatives of foreign Municipalities and the Mayors of the principal towns of France.

Since that date, many of the departments of the Municipal Administration have been successively installed in the new building, of which the interior arrangements are however still far from complete.

Built in the French Renaissance style, the modern Hôtel de Ville, of which a plan is given on p. 291 of this number, exhibits the form of a rectangle with angle pavilions and two "avant-corps," one on the principal façade and the other on the back elevation. As in the old building, the interior is divided by three courts; but the centre one only reproduces imperfectly the ancient Cour Louis XIV., which was covered with a glass roof and communicated with the Salons by a fine staircase which has unfortunately not been reproduced. This portion therefore, formerly the brilliant centre of any evening fêtes, remains in such cases dark and deserted and of no practical use.

It should be added that the Municipal Council, which is rather in want of room and is possessed by a desire to "play at Parliament," had the design of transforming this court into a Salle des Séances, at a probable cost of 500,000 francs; but it is hoped this project will not be carried out.

The total area of the Hôtel de Ville is 14,476 mètres, of which 10,570 are occupied by buildings and 3,906 by courts, areas and gardens. In its general disposition the modern building is almost identical with the old one. In the central portions are found the departments of the Municipal Council, on the quay the ordinary reception-rooms; at the rear are the state reception-rooms, and on the Rue de Rivoli the Caisse Municipale and the other administrative services.

The principal façade is preceded by a balustraded enclosure decorated with two statues in bronze, "Art" and "Science," by M. Marquette and M. Blanchard respectively. The temporary lamp-standards on this balustrade will soon be replaced by others ornamented with allegorical figures, which are being modelled by MM. Allar and Hector Lemaire.

This façade, the most richly decorated, is 144 mètres in length, while the side façades are of 80 mètres. The centre is surmounted by a campanile 50 mètres in height and decorated with "chimæras" in bronze, modelled by M. Cain. The central feature forming the clock turret contains a large-scale seated figure of the City of Paris, with two recumbent figures symbolising the Seine and the Marne. The dial has two supporting figures representing "Travail" and "Instruction." Two other statues recumbent on the exterior of the pediment personify "Vérité" and "Vigilance." These various statues are the work of MM. Hiolle, Aimé Millet, Gauthier, and Charles Gauthier. On the crest of the roof stand figures of warriors, in bronze gilt, and carrying banners.

The decoration of the principal front is completed by sixteen figures symbolising the principal towns of France, on the entablature of the second story, and forty-two statues of Parisian celebrities placed in the niches on the first floor story and the ground story. These last are surmounted by decorative canopies of delicate finish and design.

The façade to the rue de Rivoli is flanked by two pavilions similar to those of the principal façade, between which, extending on the ground floor, a large glazed gallery appropriated to the "Service des titres et des



emprunts." The upper portion, in three bays, is a repetition of the modern part of the design of the "Façade Boccador." There are eighteen other statues of Parisians of note in the niches in the pavilions of this façade also. On the quay front are the same angle pavilions, with thirteen bays between, and eighteen statues on pavilions, while the entablature of the intermediate portion, on the second story, has twelve statues representing the Arts and Sciences. In front of this façade is a large semi-circular garden with a stone balustrade, the line of which is broken by the pedestal bearing the statue of Etienne Marcel, of which an illustration appeared in the *Builder* of Jan. 19 of this year.

The Façade Lobau has vaulted entrances leading to the interior courts, and decorated with bronze lions designed by MM. Cain and Jacquemont. This façade is decorated with thirty statues of celebrated men and fourteen statues representing the towns of France, as well as figures of geni accompanied by attributes and bas-reliefs symbolical of various arts. This façade is ornamented also with escutcheons executed in mosaic on a gold ground, which form an effective polychromatic decoration.

Entering the interior from the Place de l'Hôtel de Ville by one of the large entrances to right and left of the Façade Boccador, and which are closed by fine wrought-iron gates bearing the arms of the city, we find, in the niches on either side of these entries, statues in bronze representing the Hérauts d'Armes and officers of the city in the fourteenth, fifteenth, and sixteenth centuries. These have nearly all appeared in recent Salon exhibitions, and are the work of MM. Aizelin, Coutan, Chaplain, Morice, Captier, Carles, Cordonnier, and Guilbert. In each of the courts there is a fine staircase in a tower in the angle, somewhat recalling that of the Château de Blois. One of these is shown in the principal illustration in our present number, showing part of the interior of the South Court. These courts are ornamented with eight medallion portraits of eminent Parisians, six portrait-statues of the same class, and two bas-reliefs representing the Seasons. Those of the South Court, the work of the lamented sculptor Longepied, representing Spring and Summer, are especially remarkable.

The Central Court, in the middle of which stands Mercier's noble group, "Gloria Victis," contains, under the shelter of its arcades, the "Premières Funérailles" of M. Barrias and the "Paradis Perdu" of M. Gautherin; and twelve bas-reliefs decorate the heads of the doors which open from this court.

The door in the centre of the Façade Boccador is in oak, carved with heads, carvings, garlands, &c., and lions' heads holding the knockers. This leads, by a staircase of ten steps, into the Salle des Prévôts, in which marble tablets are fixed bearing the names of all the successive municipal magistrates, from that of Jean Augier, Prévôt des Marchands in 1228, to that of M. Poubelle, the Prefet in office at present. This apartment, of fine effect generally, though rather hard and mannered in detail, is divided into three aisles by columns with composite capitals, from which spring the ribs of the vaulting. A view of this Hall forms another of the illustrations in our present number.

Two stone staircases with richly decorated ceilings lead from the central court to the principal story above; these are specially for the use of the Municipal Council. But on fête days the State entry of the guests is by the Salle St. Jean, which serves as a vestibule to the Grand Staircase. This large hall, lighted by fifteen arched windows opening on the Place Lobau, serves generally for public meetings, elections, distributions of prizes, and for drawing the lots for conscription. It is entered by two doorways ornamented with caryatides designed by MM. Gautherin and Chas. Gauthier, and symbolising Universal Suffrage, Instruction, Peace, and War.

The "Grands Escaliers des Fêtes," the decoration of which has been entrusted to M. Olivier Merson, are exact reproductions

of those of the ancient Hôtel de Ville. They consist of two straight flights, opposite to one another, between walls of coloured marbles with niches in them. Here are to be placed the two fine marble statues by M. Barrias, "Le Chant" and "L'Accompagnement," which were in the Salon of 1888, and were illustrated in the *Builder* of June 16 of that year. The corresponding niches are intended for the statues representing "Fleurs" and "Fruits" left unfinished by the late M. Degeorge, and which are to be completed by M. Delaplanche. On the upper level two balustraded galleries surround the stairs, and marble columns on either side carry the vaults. A view of one of these staircases forms a further illustration of our present number. MM. Joseph Blanc and Schommer are commissioned to execute paintings on the vaulting surfaces, and sixteen landscape-painters, whose names we have previously published, are to decorate with landscapes the side galleries, one of which communicates directly with the Salle des Fêtes, while the other adjoins the two courts, north and south. In the two side galleries again, five eminent artists, MM. Jules Bréton, Damoye, Pelouze, Rapin, and Harpignies, are to paint scenes from the Parisian suburbs.

Following the route adopted for official receptions in entering the salons on the principal floor, the left-hand or "arrival" staircase conducts to a large vestibule, somewhat deficient in light, which is to be decorated by M. Puvion de Chavannes with an immense painting of "The Seasons." The vestibule of the other staircase, which exactly corresponds with this, has been reserved for M. Roll.

From this vestibule we pass into a second room, opening to the right on the "Salle des Banquets" and separated on the left from the "Salle des Fêtes" by an arcaded portico, repeated at the other end of the same salle. MM. Henri Lévi and Félix Barrias are to decorate these two porticoes, which will also have four marble terminal figures by M. Guillaume, representing Sappho, Anacreon, Horace, and Lesbia.

The Salle des Banquets is entirely lined with carved oak wainscot relieved by gilding. Between the fluted pilasters which support the entablature are niches decorated with marble statues of which the following are the subjects and authors:—"La Chasse," by M. Barrias; "La Pêche," by M. Falguière; "Le Toast," by the late M. Idroci; "Le Moisson" and "Le Chant," by M. Chapu; "La Vendange," by M. Crank. In the frieze is a decoration in cameo, composed of animals and attributes of the chase. The eight spaces beneath the door pediments have been given over to M. Volion, while the ceiling is to be the subject of a competition.

The Salle des Fêtes, larger than the old one, is flanked by a large gallery communicating with it by thirteen arches separated by fluted square columns with Corinthian capitals. The general decoration of this gallery is to be put to competition, with the exception of six large panels to be treated by MM. Cazin, Baudouin, Blanchon, Delahaye, Clairin, and Ehrmann. This apartment, of which the sculptures only are completed, is 50 metres long by 12 wide and 13 in height. On the centre of the ceiling M. Benjamin Constant is to paint the subject of "La Ville de Paris Conjoint le Monde à ses Fêtes"; on the adjoining portions MM. Gervex and Aimé Morot will execute paintings representing Music and the Dance; M. Gabriel Ferrier will execute floral decorations and other minor ornaments, while M. Aublet will treat in cameo the six small compartments round the ceiling. This decoration will be completed by the figures to be painted in the vaults by MM. Humbert, Paul Milliet, Weertz, and Hippolyte Berteaux, which will personify different regions of France and French colonies. We may add that the ceiling of this salle is already adorned with caryatides by MM. Boucher, Boisseau, Dumaige, Granet, Mariotom, Moreau-Vauthier, Berthet, Perrin, Germaine, Michel, Lobre and Debré, and also by large

seated figures by M. Croisy. Over the entablature, between the bas-reliefs, is a gallery with a balustrade of red marble. The Salle des Fêtes communicates directly with the Salle des Caryatides, which opens, in the form of a loggia, on the two grand staircases, and the decoration of which, owing to the death of Cabanel, is at present in uncertainty. A salon situated at the north end of the Galerie des Fêtes corresponds to the old "Salon des Paix," which was so admirably decorated by Delacroix. This apartment communicates with the Salon Roll, which leads us back to the grand staircase.

Returning towards the Salle des Banquets and turning to the right in the direction of the Quay, we come into the room reserved for the work of M. Jean Paul Laurens. Here the walls are to receive a series of historical paintings the subjects of which have been already given.\* A small intermediate room which is to be decorated by M. Tattetgrain in concert with MM. Cestron and Jeannin, contains at present a very fine piece of Gobelin tapestry, "La Terre," after Lebrun.

This passage leads us to the three grand Salons de Réception looking on to the Quay, and the decoration of which has been subdivided as far as subdivision could be carried, a mistake, for these three rooms, which communicate with one another by a series of arcades, form an architectural whole, and absolutely demanded a complete and united system of decoration. Anything like a differing scale of figures in the friezes, which run continuously except for the interruption of the arcades, and can be seen together, would have the very worst effect; and it is to be hoped that the numerous artists, of very various tastes and temperaments, who have been invited to execute decorations here, will at least consult together so as to arrive at something like unity of treatment, instead of transforming the three salons into a mere picture exhibition of independent works.

That this caution is not uncalled for will be apparent on only reading the multifarious nature of the scheme for this part of the decoration. In the Central Salon, M. Bonnat is to paint on the ceiling the Apotheosis of the Arts. In the frieze M. Léon Glaise is to illustrate Music and Dancing. On the twelve escutcheons M. Chartran is to "symbolise" the Arts; in the four medallions, on a gold ground, another artist will paint the portraits of Philibert Delorme, Pierre Puget, Poussin, and Rameau. Lastly, MM. Tony Robert-Fleury, Ravvier, Bouveret and Layraud, are to decorate the arcades with figures representing Architecture, Music, Painting, and Sculpture.

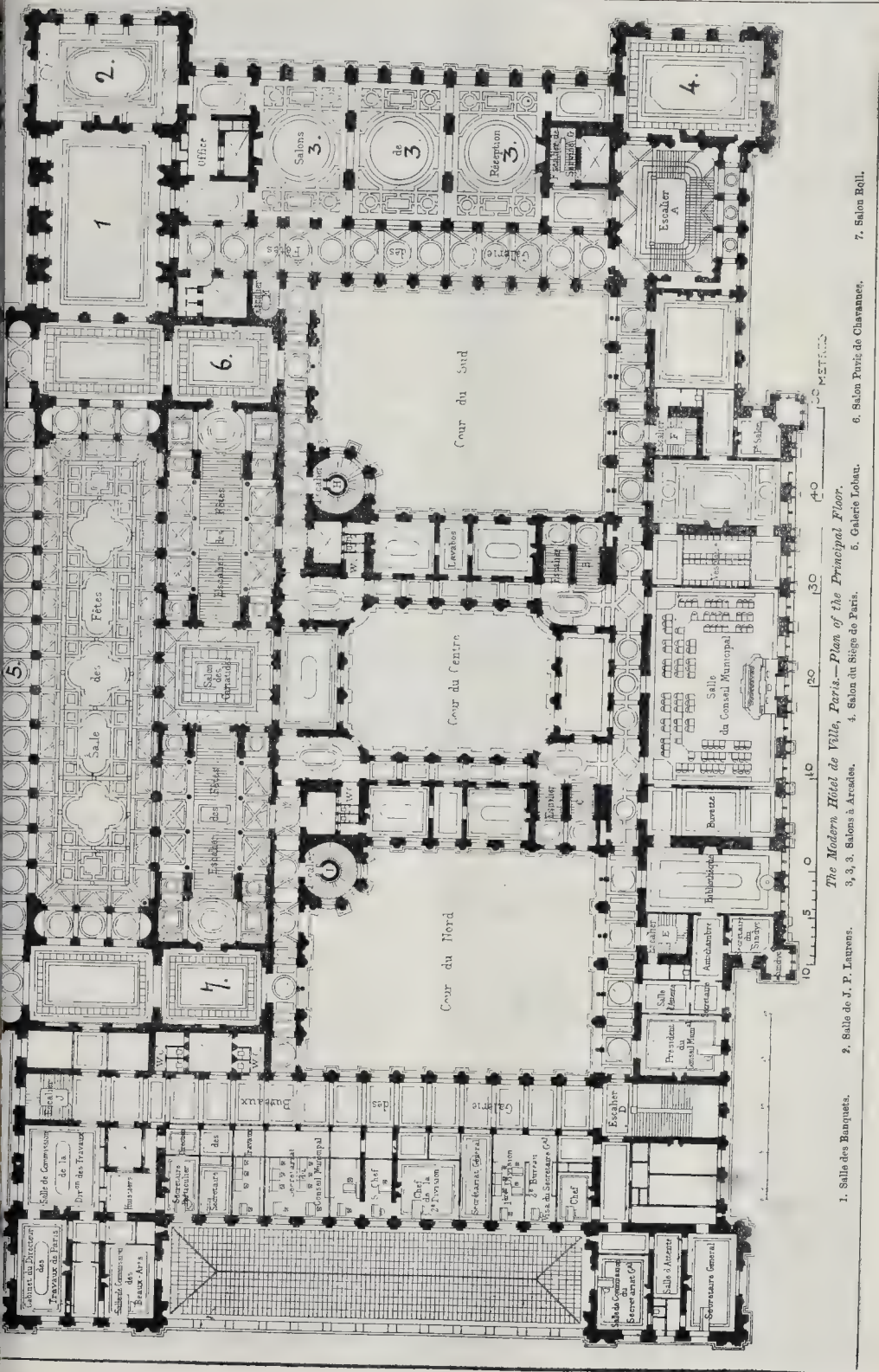
On the ceiling of the next room of the series M. Jules Lefebvre will represent the "Glorification des Lettres." In the friezes M. Cormon will trace the "Histoire de l'Écriture"; on the escutcheons M. Albert Maignan will symbolise the principal works of literature; on the four medallions, the artists for which is not yet chosen, will be painted the portraits of Molière, Descartes, Victor Hugo, and Michelet; on the arcades MM. Thirion, Hector Léroix, Henner, and G. Callot are to paint figures of History, Eloquence, Poetry, and Philosophy.

In the third salon, on the opposite side, M. Bernard will represent on the ceiling the grouping of the Sciences, with allegorical representations of Steam and Electricity. On the friezes M. Lerolle will illustrate "L'Amour de la Gloire" and "L'Amour de la Science." In the escutcheons M. Carrière will illustrate the leading applications of science, and in the panels of the arcade MM. Buland, Armand Berton, Jeannivet and Rixens are to paint, in a modern rather than an antique spirit, representations of Earth, Air, Fire, and Water. This vast decorative system will be completed by twelve landscapes disposed round the three salons, of ten of which the following are the subjects and the artists selected:—

Le Dimanche au bord de la Seine. M. Gustave Colin.  
La Seine à Bougival ..... M. François.  
Le Pont de Champigny ..... M. Bellah.

\* "Letter from Paris," *Builder*, February 2, 1889, page 84.





The Modern Hôtel de Ville, Paris.—Plan of the Principal Floor.

- 1. Salle des Banquets.
- 2. Salle de J. P. Laurens.
- 3, 3, 3. Salons à Arcades.
- 4. Salon du Siège de Paris.
- 5. Galerie Lohau.
- 6. Salon Privé de Clavanne.
- 7. Salon Roll.



|                              |                    |
|------------------------------|--------------------|
| Le Quai de l'Institut.....   | M. Lapostolle.     |
| La Place de la Concorde..... | M. Lamy.           |
| Les Carrées d'Arcueil.....   | M. H. Saintin.     |
| Le Jardin du Luxembourg..... | M. Guillemet.      |
| Les Cours de Longchamp.....  | M. J. Lewis Brown. |
| Le Pont Neuf.....            | M. Lépine.         |
| Le Pavillon de Flore.....    | M. Luigi Loir.     |

Of the two other panels, to be painted by MM. Vauthier and Berthelot, the subjects are not yet fixed.

At the other side of these three salons, which contain monumental chimney-pieces adorned with figures in stone by MM. Thomas and Cavalier, is a vestibule identical with that of M. Tattet; this M. Lihormitte is to decorate, along with MM. Quost and Monginot. From this room, provisionally ornamented with another piece of Gobelin's tapestry representing "L'Eau," after Lebrun, we enter the salon at the angle of the Place d'Hôtel de Ville, reserved on fête occasions for the Corps Diplomatique, the decorations of which are to be put to competition, with the reservation that the artists are to select their subjects exclusively from incidents in the Siege of Paris.

Parallel to the Salons à Arcades runs a long gallery lighted from the South Court, the five bays of which, adorned with cupolas, are to be decorated by M. Galland with a series of subjects illustrating Parisian handicrafts. This gallery leads to the Escalier d'Honneur, which is one of the most successful portions of the design of MM. Ballu and Leprieux. It is at the foot of this staircase, ornamented with a fine wrought-iron balustrade, that there stands M. Fremiet's equestrian statue of the "Héaut d'Armes," holding a torch to illuminate the stair, an illustration of which we published in the *Builder* June 27, 1885. In a niche behind it is the pedestal with the bust of the late M. Ballu by M. E. Barrias. It is ornamented with a figure of a genius in bronze, by M. Coutan. This staircase, on the ceiling of which M. Elie Delaunay has represented the "Gloire de Paris," conducts by three flights to a vestibule on the first floor decorated with six console terminal figures by M. Carrier Belleuse. On the ground-floor are to be noticed two fine groups in stone: "Justice" by M. Mercier, and "Security," by M. Delaplanche. The first-floor level is decorated with the following statues and groups: "Les Lettres et l'Instruction," by M. Schonenwerk; "L'Assistance Publique et la Science" by M. Mathurin Moreau, "Commerce" by M. Delaplanche, and "Art" by M. Mercier.

The Municipal Council occupies all the portion of the first-floor adjoining the principal facade and around the Central Court. The Library and Committee Rooms contain a certain number of works of art purchased every year from the Salon. In the Salle du Budget are two pictures commissioned in 1830 for the old Hôtel de Ville, and which, having been left during the Empire in storage in the town, escaped the fate of the destruction of 1871, and were put up in their present situation in 1882. The one, by Delaroche, represents "Les Vainqueurs de la Bastille à l'Hôtel de Ville"; the other, by Schnetz, records the taking of the Hôtel de Ville in 1830. There is to be observed also in this same room a fine flower-piece by M. Jeannin, an odd composition by M. Cazin, entitled "Jour de Fête," an allegory of the Republic painted in 1848 by Gerôme (and not one of his best works), and a splendid bust of St. Just, by David d'Angers.

The "Salle des Séances" of the Municipal Council, the windows of which open in the centre of the Façade Boccador, occupies the place of the ancient Salle du Trône. It is lined with lofty oak wainscot, and has a ceiling in compartments, richly decorated with escutcheons and garlands. The tribunes reserved for the Press and the public are decorated with fluted columns and with temporary textile hangings, to be replaced with stamped leather afterwards. The furniture is very simple. The eighty seats of the councillors are arranged in a semi-circle facing the tribune of the orators, behind which are the seats of the President and his assessors.

All the rooms situated on the principal facade are approached by two long galleries looking on the north and south courts; the windows are filled with stained glass, in which M. Oudinot has reproduced the armorial bearings of the ancient prefects and mayors of Paris. The rooms belonging to the administrative service are approached on each story by long corridors, numerous stairs, and three hydraulic lifts. Gas and electric light give abundance of light everywhere. The heating is by hot-water pipes, the result of which has not been satisfactory; the temperature is often complained of as being oppressive, and the heat difficult to regulate or moderate. Unfortunately, also, the architects have been (apparently) too much taken up with architectural effects, and have not paid sufficient attention to the details of arrangement to meet the requirements of the various departments, and in the practical sense these portions of the building leave much to be desired; and though the new building is larger than the old Hôtel de Ville, it offers much less office accommodation, and it has been found necessary to form annexes which, without counting the Pavillon de Flore, occupy already a part of the Avenue Victoria and of the Caserne Lobau.

In the present state of the Hôtel de Ville, while the decoration of the interior is only in an embryonic condition, and it becomes necessary on gala days to hide the bareness of the walls with the hangings from the collection of the Garde-Meuble National, it is difficult to give a minute description of its details. We have only endeavoured to give the main lines of an *itinéraire* for the building, and the nature and distribution of the decorative work which is to be done there. From the preceding notes it will be seen that there has been rather too much cutting up of the work into separate sections under various artists, which will no doubt render the result less satisfactory as a whole than if a more broad and uniform system had been pursued; but there is no doubt that when once completed, the whole will offer to future generations a remarkable compendium of the work of French art at the close of the nineteenth century.

We may terminate by a few figures. The construction of the Hôtel de Ville has cost about 18,000,000 francs. The sculpture executed up to this date represents an expenditure of 1,624,000 francs. If to these sums already expended we add the sum of 2,500,000 francs voted for the pictorial decoration of the interior, we arrive at a total of 22,124,000 francs, as the amount required to repair the devastation caused by civil strife,—an immense sum, but not available, unfortunately, to bring back again the numerous precious objects of ancient art which have disappeared for ever.

#### ANCIENT DECORATIVE BINDINGS.

THE majority of the bindings illustrated in Mr. Wheatley's handsome book in illustration of some of the bindings in the British Museum\* are ancient, though he concludes the series with two pieces of contemporary French work. The book contains reproductions by photography of sixty-two bindings in the British Museum, selected either for their artistic beauty and effectiveness or for the historic value of the book. This is perhaps a not quite prudent admixture of two kinds of interest which appeal to two distinct classes of persons. The student of design will look with indifference on some of the "historic interest" examples, and the historic man will be dissatisfied at being presented with beautiful bindings of books which may not be of the highest interest to him. However, generally speaking the taste for the artistic effect of good binding only grows up after a man has become something of a bookworm and likes everything in the

shape of an old book, so perhaps the two tastes may be accommodated. There is no sort of reason, however, why a student of design should not find an interest in bookbinding quite independent of any book-collecting taste, for many old examples are admirable quite apart from the fact of their being books for beauty or suggestiveness of design.

Mr. Wheatley's examples, arranged chronologically, serve in the first place to remind us of the various methods and material which may and have been used for covering books, whether MS. or printed. His first plate gives us the Psalter of Melissende bound in carved ivory of a rich design of rather Byzantine type. The MS. dates from the twelfth century, but it has been suggested that the cover dates from three or four centuries earlier, and the style does not contradict this conclusion. The centre portion of the cover contains medallions with carved subjects from the life of David, with borders formed by entwined straps; the border round the edge is purely decorative and very rich and beautiful in effect. Next we have a binding in which Limoges enamel is the decorative process, forming a geometric pattern on the margin, and on the background of a vesica in the centre. The binding, probably, says Mr. Wheatley, about the beginning of the fourteenth century, is a curiosity, but the design is commonplace and would not merit much attention if it were a modern book. The author remarks that such a cover, instead of preserving a book, introduces a destructive element by reason of its weight. "The upper cover to which the enamel is fixed is half the thickness of the book and exceedingly heavy." The enamel is on the upper side only, the lower cover being of leather. Next we have a silver cover, a form of cover objectionable only (apart from its costliness in the first instance) from the danger to which a rare book thus bound is exposed, of being stolen for the value of its cover. On this consideration would seem that bookbinders of later date hit the mark pretty well in making leather their principal material, inasmuch as it is durable, capable of rich ornamentation, and not of such intrinsic value as to tempt marauders for its own sake. The silver cover shown here is a remarkable one in design; the centre contains a seated figure of Christ in bas-relief, the wide borders are decorated by a scroll and flower ornament of delicate design, in slight relief, and with gems inserted here and there; these are modern stones, inserted in 1838 to fill places once occupied probably by crystals. In the next example the upper side of the cover is overlaid with sheets of copper gilt, and studded with big crystals: the effect is neither beautiful nor could it be pleasant to the hand; the general appearance is rather barbaric. Then we have a binding with a painted plaque in the centre, an uncommon book decoration, also unsuitable, being liable to be soiled in handling.

These are all the specialties of materials illustrated, except some examples of embroidered binding later on, which in fact are not so much binding as a cover for the binding, and the effect is not such as to make one wish for a revival of it.

The rest of the book is occupied by leather bindings of various styles and dates, and illustrating various tastes and methods of regard to the design and placing of the ornament. The usual theory of binders' designs has been to have a centre with a border round it, the border almost invariably more or less enriched, the centre sometimes plain, sometimes with a special device or with a separate diaper pattern of its own. Probably the border, which seems to be a kind of sacred institution, is really the most suitable way of proceeding in decorating the back of a book; yet it might be desirable to have more frequent attempts made at other combinations. Rossetti struck out a rather new line in the binding of his Poems, discarding borders altogether, and having contrasted surfaces of plain work and rich diaper; it was illogical but decidedly effective, and

\* Remarkable bindings in the British Museum; selected for their beauty or historic interest, and described by Henry B. Wheatley, F.S.A. London: Sampson & Low & Co. Paris: Gruel and Engelmann. 1889.





*An English Binding of the Eighteenth Century.*

probably helped to draw notice to the book. One of Mr. Wheatley's examples shows ornament in the centre and a perfectly plain belt round the edge, which also has a good effect.

The interlacing strap ornament in semi-rabesque patterns so characteristic of the Venetian binders is very well reproduced, with some little local variety of effect, in an English example of the sixteenth century (plate x), showing, as the author remarks, how quickly the fashions of one country spread, even at that time, to another. This style of binding decoration has been perhaps a little overated; it is somewhat cold and mechanical. Laioli's binding shown in plate xxix., a most finished specimen of its kind, is after all rather neat execution than good art; there is no fancy or invention in it. One of the worst designs in the book is that of good Queen Anne's "English and Italian Songs" (plate xxii.) in which there is a centre on a border defined by plain lines, but the starfish and of powdering used is placed equally all over the surface, centre and margin alike, so that the effect of a border is altogether lost. This binding is of the "historic interest" class, we should say; there is no artistic beauty in it worth illustration. Plate xv. shows a Venetian binding which seems to have sprung from a moment of inspiration; there is none of the mere interlacing strap-work, but a beautiful thin flowing conventional foliage design, Classic in grace, Gothic in freedom: a very remarkable design altogether, and a very curious contrast, as the author remarks, to the tame effect of commonplace in the preceding plate,

though both were done at Venice probably within a few years of each other. Some raised and panelled Italian bindings (plates xvi., xvii.) of very Oriental outline, we like not so far as the raising and panelling goes; it is ponderous and pretentious, and obviously done for effect. An Italian binding to a German MS., of late sixteenth century (plate xviii.), is a very fine example of the rich effect produced by a geometrical design carried out in minutely tooled small detail all over the surface; and the Spanish example in plate xix. is an instance of the effect produced by multiplying borders, these being in three depths, all richly ornamented, and leaving only a small centre. The type of binding in which the ornament is formed by merely spotting some little figure, a fleur-de-lis or a thistle for instance, at equal distances all over the surfaces, with one narrow line for a border, and a little floral ornament in the angle, is poor and second-rate in effect, though coming into fashion again, apparently, in the present day. It is curious that some of the most mechanical of these are attributed to Clovis Eve, who is equally credited with the exquisite example of floral decoration in the little book shown on plate xxxvi. A splendid specimen of rich and minute design is the binding by Le Gascon, plate xl., a morocco binding with a geometrical pattern formed by interlacing bands, and filled in with the most minute and delicate tooling: there is no border. The effect is rich to a degree in the black and white illustration; is it equally effective in the original? We have not seen the latter, but should think it open to doubt. The modern binding by Duru (plate lxi.)

is an example of the perfection of skill, elegance, and finish of detail with no artistic invention or feeling. As showing the contrary quality, originality and power of design, we have selected for reproduction (on a smaller scale than the original) the illustration of an English binding of the last century, from plate lvii. of the book. This design is a remarkable example of freedom and play of fancy in the design of a book-cover, and shows the hand of an artist with a distinct and marked individuality of his own. It seems indeed to belong to no school, and to be a pure exercise of fancy; and we give it therefore partly as an example of the work of an artist in bookbinding, whoever he may have been (for the binder is unknown), who was not content to follow the fashion or to imitate older examples, but worked to please his own fancy, and succeeded in giving to his binding an almost poetic expression and sentiment. Why should not others do the same?

#### NOTES.

**E** referred the other day (p. 218, *ante*) to an application on the part of Mr. Henry Hucks Gibbs for a faculty to restore the Lady Chapel at St. Albans Cathedral, remarking that the obvious motive for the application was to rescue this portion of the building at least from the tender mercies of Lord Grimthorpe, as anything done at Mr. Gibbs's charge would be done under the direction of a competent architect. We may now state that the architect to whom Mr. Gibbs wishes to entrust the work is Mr. A. W. Blomfield, A.R.A., under whose direction the restoration of the great screen in St. Albans Cathedral has already been carried out. The question for decision, therefore, will really be whether the Lady Chapel is to be restored under the direction of one of the most refined Gothic designers of the day, or whether it is to be pulled about and disfigured by the amateur architectural bungler whose notions of Gothic architecture are represented by the south transept front with which he has disfigured the building; a view of which, for those who wish for any such evidence of the nature of Grimthorpe's Gothic, will be found in the *Builder* for Sept. 22, 1888.

**S**INCE the above remarks were written, we hear that the stone-work of the parapet over the great east window of the choir is coming down to the ground in baskets. This is a preparation for a new raid on another portion of the building, we presume. Any one who wants to see any part of St. Alban's had better lose no time over it, as it is obvious that Lord Grimthorpe intends to leave not a shred of it for them. We do not blame him so much, as he knows no better, and his proceedings seem rather like those of a man who is not entirely sane and is possessed by a kind of uncontrollable zeal for pulling everything to pieces. The persons to be blamed are the ill-informed Chancellor of the Diocese who gave over the building into such hands, and the indifferent English public who see a building that is a national possession getting permanently defaced, and do not think it worth while even to protest.

**T**HE last of a series of meetings which have taken place during the winter was held in the library of the British Archaeological School at Athens on the afternoon of Friday, April 5, when a paper was read by the Director, Mr. E. A. Gardner, on "Early Greek Vases and Greek Colonies in Egypt." In this paper Mr. Gardner remarked on the evidence derived from the discoveries in Egypt of Early Greek vases, and corrected what he regarded as the mistaken attribution of certain classes of vases to Naukratis. Some full-size drawings of Athenian mouldings were also exhibited, and Mr. R. W. Schultz made a few remarks on the scheme which had been taken in hand by the School for the collection and publication of these in a systematic and complete form; he also made a few com-



parisons of the different types amongst the examples shown. During the course of these winter meetings, six papers on early vases have been read by Mr. Gardner, and notes on various subjects have been contributed by students; as, for instance, on the origin and influence of the sculpture of the type of Scopas, by Mr. A. J. R. Munro; on the Byzantine churches in Athens, by Mr. R. W. Schultz, &c.

THE Greek Chamber has voted a sum of 15,000 drachmas, or about 500*l.* sterling, for the repair and restoration of the Byzantine churches at Daphne, in Attica, and St. Luke, near Livadia, in Boeotia. These churches contain interesting mosaics, which are in a more or less ruinous condition, and which have recently been much damaged through earthquakes and other causes. It is proposed to spend the money in making these secure, and in necessary repairs on the fabric of the buildings. We hear that the dome of the church at Daphne is so badly cracked that it will have to be rebuilt, and there is a proposal to transfer its great mosaic of Christ the Pantocrator to the National Museum at Athens. We do not see why, if the dome has to be rebuilt, the mosaic cannot be afterwards refixed. It would be much more appropriate to leave it in the place it has hitherto occupied, and which it was designed for, than to transfer it to the walls of a Museum, at the cost of depriving the church of one of its chief objects of interest.

EXCAVATIONS have been begun on those portions of the floor of the Parthenon where the original pavement had been destroyed. They show us that the marble pavement, which is about 10 in. thick, rests on a solid platform of good squared porous stone blocks, of an average size of 3 ft. by 2 ft., built course above course. These blocks seem to have come from the cella walls of the earlier temple. Several Christian tomb-chambers have been discovered cut in this substructure, and in some of these bones have been found. Three of them are in the *ορθόδομος*, which was used as the narthex of the Christian church, and which still retains considerable traces of Christian painting on its walls, and one is in the north-east corner of the *ναός*. Two are ordinary grave-tombs, about 7 ft. long, by about 2 ft. 6 in. wide, and they vary in depth from 3 ft. to 6 ft. The third is a barrel-vaulted chamber, also about 7 ft. long by 2 ft. 9 in. wide, by 3 ft. 9 in. high to crown of vault; at its east end is a pit for access, about 2 ft. 6 in. square. Traces exist showing that the tomb proper was closed by a slab cemented in, and which was fixed 6 in. from the end of the pit, which latter was covered by a flat stone. This chamber is lined inside with a reddish plaster. The floor is of marble slabs, on which the body rested, and these are pierced by a series of circular holes, about 1 in. diam., for the purpose of letting any water that might get in run off between the courses of the stone substructure below. This grave was empty. It had been opened probably, and the body removed, before the Turks conquered Athens. They are the tombs of archbishops and bishops, and may be of various dates. On the pillars at the west end of the Parthenon are numerous Christian inscriptions, dating from the sixth to the thirteenth century, recording the names of archbishops and other dignitaries of the early Church, some of whom were probably buried here: three of these chambers lie east and west, and one north and south. A bell has also been found with a Latin inscription and some figures of saints on it. It is probably of Frankish times, thirteenth or fourteenth century.

A REPORT by Mr. Spear to the Local Government Board, dated March 5th, in regard to a prevalence of typhoid fever at New Brighton, Cheshire, furnishes a warning as to the risk from slaughter-houses in too close connexion with inhabited dwellings.

\* Byrne & Spottiswoode, London: A. & C. Black, Edinburgh: Hodges Figg's & Co., Dublin.

The Medical Officer of Health had reported the situation as bad "because so closely surrounded by dwelling-houses," though he appears to have rather abandoned his ground on this point afterwards. Mr. Spear reports:—"The area in which the slaughter-house has been established may be said to be small and crowded, surrounded at almost every point by high buildings and containing already a quite unusual number of sources of aerial contamination"; and the construction and arrangement of the slaughter-house buildings are not in themselves satisfactory in a sanitary point of view. The evidence as to dates of the prevalence of disease and of the slaughter-house operations appears to establish the relation of cause and effect. The report goes into further particulars as to the drainage and sanitary condition of New Brighton, which is admitted has been improved of late, but concerning which the following statements are made among others:—

"Drains are commonly carried beneath the floors of dwellings, and without the special precautions necessary in such cases; the disconnecting trap in the course of the external private drain is only exceptionally provided, and, though kitchen slop-stone pipes have been 'disconnected,' gullies, having unbroken communication with the drain, and so with the sewer, often exist in cellars. I was led to visit certain 'lock-up' shops, consisting chiefly of refreshment-rooms and the like on the Parade, by finding that in two cases the families of the occupiers, living elsewhere, had suffered from fever; and here, in places much frequented by excursionists and other chance visitors, the condition of the private drainage was such as to cause a serious nuisance, well calculated to spread such a disease as typhoid fever. In one an excessively foul water-closet and lavatory were situated in a dark and wholly unventilated recess between two eating-rooms, and I was told that in several other cases the structural arrangement was the same."

AT Lower Brixham, the small fishing town on Torbay, opposite to Torquay, there has been an epidemic of scarlatina, and Dr. Blaxall reports to the Local Government Board (March 8th) on the probable causes. As is often the case in small seaport towns, the sewer discharges on to the sea shore near the town, above low water mark. The outlet is not protected by a flap, and when the opening is exposed, the wind from certain quarters blows direct up the sewers; while at high tide the sewer is tide-locked, and little provision is made for its ventilation. The sink pipes and drains very commonly go direct into the sewers, and it is not surprising that "complaints of intolerable stinks in houses were general." But the most important evil seems to be the state of closet accommodation:—

"Where closets are placed in suitable positions in yards they are seldom provided with water for flushing, and consequent blockage of drains with accumulated excrement is frequent. But a greater evil exists in the most unseemly positions in which the closet pans are occasionally placed, sometimes in the window sill of a living room where the family live, cook, and take their meals, or in a pantry where food is kept, or in a bed-room, or again under the staircase, in the cellar or washhouse, and so forth: these make-shift closets being unprovided with water for flushing, and being often without means of air or light. Many dwellings have no closet accommodation at all, and have neither available ground space outside nor any suitable position within the dwelling to admit of closet provision. Here the families are supposed to keep the excrement in vessels till it is fetched away. This is professedly done by means of metal carts sent round daily to collect house refuse. But in some instances the excrement is thrown on to the street grids, creating revolting nuisance."

The Medical Officer is reported as "not attending to his duties in any such manner as is contemplated by the Public Health Acts and required by the Board's Instructions," but it is also stated that he has a salary of only 20*l.* per annum, and another gentleman has the joint office of Inspector of Nuisances and Water Bailiff for the urban district, and Road Surveyor to the whole parish, at a salary of 60*l.*, of which 12*l.* is supposed to compensate for the Inspector of Nuisances duties. It is not surprising that the report recommends that steps should be taken to remunerate the Inspector of Nuisances at least on such a scale that he can be reasonably called upon

to perform the duties properly attaching to that office. Among other practical recommendations the report suggests that "Where closets and pans in communication with sewers occupy positions within dwellings dangerous to health, they should be abolished, and proper closet accommodation provided. Where no suitable place can be found for making such provision, the question ought to be raised whether the house is fit for human habitation."

THE building in Park-place, Edinburgh, for the Edinburgh Students' Union,—a striking and effective structure in the early "Scottish Baronial" style, designed by Mr. Sydney Mitchell, is to have its dining-room decorated with a series of designs commemorative of the worthies of the University. Mr. W. B. Hole, R.S.A., Mr. Sydney Mitchell, and Mr. W. M'Farlane have been constituted a sub-committee to select and superintend the execution of the designs. In connexion with the subject of decoration we may mention also that the walls of the Robertson Memorial Hall, Grassmarket, were some years ago covered with copies of Millais's "Parables," executed in black chalk by students of the School of Design. These are now to be painted, under the superintendence of Mr. W. S. Black.

WE referred in a "Note" last week to the proposed acquisition of Brockwell-park, Herne-hill, as a park for South London. The project is being taken up with much heartiness in the localities affected, and a large and enthusiastic meeting in its favour was held on Monday evening last, in the Effra Public Hall, Brixton. Resolutions affirming the great desirability of acquiring the Park, and asking the promoters of the prior but smaller scheme of Raleigh-park to abandon it in favour of the Brockwell-park project, were carried with great unanimity. It is hoped that the London County Council, the Lambeth Vestry, and the Camberwell Vestry will aid in the acquisition of this fine park. Mr. T. E. Knightley, the well-known architect and surveyor, was one of the speakers at the meeting, and he told the meeting that the price asked for the land, 1500*l.* per acre, is exceedingly moderate. The meeting was given to understand that there was good prospect of help being rendered to the project by city merchants, bankers, and stock-brokers. Owing to some hitch, the new park at Camberwell, to be called "Myatt's Fields," has not yet been opened, although the County Council last week resolved to open it on the 13th inst., as we stated. While writing, we may take occasion to correct a mistake which we made last week in speaking of Dulwich Park. We are glad to find that the area of the land given by the Governors of Dulwich College for a public park is 72 acres, not 183 acres.

LITTLE Strawberry Hill, adjoining Walpole's famous residence at Teddington, will be offered for sale at the Mart on the 14th proximo. Including the old orchard and garden the site covers rather more than five acres. The house was occupied by Mrs. Clive, as a tenant, it would appear, of Walpole, during the period between her retirement from the stage, on April 24, 1769, and her death on September 7, 1785. It was then let by Walpole to his friends, the Misses Agnes and Mary Berry, upon their return from Florence in 1791. These ladies, together with her father, Mr. Robert Berry, he made his literary executors. The two sisters removed hence to Petersham, where they died in the same year (1852). In 1813 Little Strawberry Hill was leased to Alderman Sir Matthew Wood, during whose occupancy it formed the resort of many civic festivities by way of what we now term "water-parties," the guests being conveyed up the river in the barge *Maria Wood*, which was built for the Corporation in 1816, by Messrs. Field & White, to replace the *Crosby*, and was so named after the Alderman's daughter.



**A** BILL procured by the North British Railway provides for the formation of a hotel at Edinburgh, adjoining the station, at the eastern extremity of Princes-street. An endeavour is to be made to have the northern elevation, towards Princes-street, thrown back to a line with the Post-office, an arrangement which would greatly relieve the traffic at this, the most crowded part of the city, besides being a considerable improvement in an artistic sense. The new hotel will extend southwards towards the station, and screen off the unsightly backs of buildings in North Bridge-street, and its west elevation will form an architectural feature in the vista down Princes-street looking to the east.

**T**HE Exhibition of the New English Art Club is somewhat less eccentric and also somewhat less ambitious than last year's exhibition; it contains some very interesting things, but we are unable to discover any special motive for the existence of the Club as a separate corporation in art, unless it is intended as the special refuge of artists who dislike the trouble of finishing their pictures. Mr. Paterson's "Winter on the Cairn" (37), for instance, one of the larger landscapes, is what may be termed a very fine sketch in oil of a landscape, very truthful in its atmospheric effect, and in fact the basis of a fine picture. At present it is a sketch only. "In the Orchard" (54) by Mr. Scott Tuke, is a bright effect of sunlight, and Mr. W. Estall's "Dawn" (56) is fine, and seems to come straight from Nature. Mr. Roussel's "Evening in June" (70), a grey misty wooded scene in which the only colour seen is a lady's blue dress in the middle-distance, looks absurd enough on a near view as a representation of June, but produces its effect from a more distant standpoint. Mr. Corsan Morton's "Autumn Evening" (74) is a fine twilight sketch; twilight seems a favourite aspect with the painters of this school, e.g., Mr. H. Dalzell's "Night-Fall" (49), which however produces no effect of night; it only looks like a fog. Mr. T. F. Goodall's "Willow, Alder, Marsh, and Moor" (79) is a passable landscape, and Mr. Sidney Starr's "Spring Evening" (37) a fine one, if only the road in the foreground were a little less like canvas stretched out on the ground. Mr. F. Brown's little picture "A Water Frolic" (90) is charming in composition and in the character (though sketchy) of the children's figures on the bank. A very sweet profile portrait by Mr. J. J. Shannon (104) looks quite out of place in an exhibition where such vulgarities are admitted as "Verve" (12) and "Hetty" (30), and where such a daub as Mr. Whistler's "Rose and Red" (19) can be passed off as a picture. Among the good things of the exhibition we should mention a small "Study in Silver Point" (28) of a nude child, by Mr. G. Thomson.

**T**HOSE who visit the collection of "impressions" by Claude Monet, in the Goupil Gallery in New Bond-street, must be prepared for a kind of shock to their aesthetic sense on first sight of the pictures, as the managers of the Gallery seem to be aware, for they have entered this caveat in the catalogue: "As these works differ so entirely from anything hitherto shown in London, they should be considered for a short time before a final opinion of their merits is formed." This is very adroitly put, and has more common sense in it than the effusion on the subject of Monet's pictures which is reproduced from a French paper as a preface to the catalogue. After getting over the first shock caused by the crudeness and harshness of the colouring, one begins to perceive that M. Monet's object is to paint the effect mainly of strong sunlight, for which something must be sacrificed. In No. 17, for instance, "Un Tourmant de l'Epte," which shows the reach of a small river with a mass of spring foliage on the left, the leaves almost golden in the sunlight, the intense blue of the sky reflecting an intense blue in the water; at a safe distance (Monet's pictures require that) one is conscious of the reality of the general effect, detail being eli-

minated. In No. 1, "The Pyramid Rock, Port Coton," the rock is the defaulter; though in the foreground, it does not detach itself sufficiently from the sea; but a study of the treatment of the sea surface,—again at a safe distance,—shows something exceedingly real and vivid in the look of this level wrinkled surface of water with green and blue reflected lights. In the sea-piece called "Rainy Weather" (18) there is absolutely no drawing of the sea at all; it is a smudge in which a kind of effect of sea is confusedly visible. Waves have, however, distinct and characteristic forms, and one cannot represent them by smudges. There is a remarkable effect of reflected sunset light and shimmer on water in "Moulin de Linetz" (3), in spite of the verdigris colour of the foreground foliage in shadow, which almost sets one's teeth on edge. "Chrysanthemums" (9) apparently appear to M. Monet's eye as if executed in worsted work. However, there is something to think about and to study in M. Monet's paintings—always at a safe distance.

#### A BUILDING SQUIRE OF THE TIME OF ELIZABETH.\*

AMONG the architects mentioned in Gwilt's "Encyclopædia" as flourishing in the sixteenth century occurs the name of Sir Thomas Tresham. I propose to-night to say something about this gentleman and the buildings which he built, whereby we shall be able, not only to judge of his claims to be ranked as an architect, but also to see what light his work throws upon the architectural history of that time, and how far it may be instructive to us of the present day.

Into the family history of the Treshams it will not be necessary to go very deeply. They were a notable race, who for a good many generations had lived in Northamptonshire, and had seated themselves in various pleasant places in that pleasant county. There were two branches of the family, and Sir Thomas belonged to the elder. His ancestors were worshipful gentlemen; one was Speaker of the House of Commons in Henry VI's time. They all in turn were Sheriffs or Members for the county. They lived chiefly at Rushton, where, towards the end of the fifteenth century (i.e., 100 years before the period we are to consider to-night), the then squire began a fine house. They all did what they could to augment the family estates, particularly by marrying well; but it was on the dissolution of the monasteries by order of Henry VIII. that they fared best, for in nearly all partitions of ecclesiastical lands in the county at that time the name of one Tresham or another appears.

But, although the Treshams profited not a little by the division of Church property, they seem to have retained a preference for the old religion; for, when Henry VIII. and the Protestant Edward VI. had passed away, and the morose Mary, in despite of Lady Jane Grey, had ascended the throne to bring back all the old ways in religion, the reigning squire (also a Sir Thomas), warmly took her part, and in recompense was made the first and (as it proved) the last Prior of the resuscitated Order of St. John of Jerusalem. Notwithstanding his being a Roman Catholic Prior, this Sir Thomas was sufficiently reformed to marry twice, and sufficiently hardy to outlive both his wives. He had a family of three or four, and it was his eldest son who was the father of our Sir Thomas, the builder.

But this eldest son and his wife both died on one day, when the builder was but two years and a-half old, and so our young squire had to be brought up by his grandfather, the Prior. Curious as it may seem, he was brought up as a Protestant, and was not converted to the ancient religion (it is stated) till the year 1580, when he was about thirty-seven years old. But long before this the Prior had died; he did not, indeed, long survive his beloved Queen Mary, but departed this life in the first year of Elizabeth, and was succeeded by his grandson, the builder, who was then only fifteen years old. This was in 1559, and we hear nothing more of our young squire for sixteen years; nothing till 1575, in which year he was knighted by the Queen at the grand festivities of Kenilworth. In the meantime, however, he had married,

and children had been born to him. We have no particulars of his life, but we know that he must have assumed his natural position as one of the leading men in the county, that he must have studied diligently and with good result, and that he must have made many friends among the *armigeri* of the neighbourhood. Of any connexion with architecture in his studies we find no trace. In later year he said of himself that his study was little, and that little all in divinity; and even in his early life we can easily believe that divinity must have had a fascination for him, and that the influence of the Prior, his grandfather, was strong upon him. But of direct information concerning him, between his inheriting the estates in 1559 and the knighting of him in 1575, we have none. About this time, i.e., subsequent to his being knighted and previous to 1580, he suddenly blossomed out as a builder, and (if I will be correct) as an architect. His first work was the Market House at Rothwell.

The exact date of this building is not recorded, because, curiously enough, the last few syllables of the Latin inscription on it have never been cut. It ends "A<sup>o</sup> Domini Millesimo quingentesimo sep—," that is "fifteen hundred and sev—," but we know that it must have been built between 1575 and 1580, and as there is a document in existence,—an agreement between Sir Thomas Tresham and William Groomball for certain buildings at Rothwell Cross, July 2, 1578,—this may probably fix the date. The building was never finished, however, for in 1580 Sir Thomas was committed to prison for recusancy, a penalty swiftly paid for his conversion to the old religion, which occurred, as we have seen, in the same year. Throughout the following year he dated his letters from the Fleet prison; and for the next ten years he seems to have passed most of his time in prison, either in the Fleet, or at Ely or Banbury, or else in his own house at Hoggesden or Hoxton, near London. In 1593 he writes to a friend that for full eight years he had not been allowed to come into Northamptonshire; so that his architectural proclivities had no opportunity of being gratified, and the Market House at Rothwell still stood waiting for its roof, as indeed it waits at this very day.

Between the years 1593 and 1595, however, he was again building. He enlarged his own home at Rushton, as is testified by several gables bearing the date 1595 as well as his arms. At the end of his grounds he built the Triangular Lodge, which bears two dates, 1593 and 1595, and he probably began Lyveden New Building, a curious cruciform house situated a short distance from another seat of his branch of the Tresham family, at Lyveden. The fates, however, were averse to his building operations, for he was again interrupted by being imprisoned in 1596 for about one year. Then he was released, only to be once more confined two years later. No wonder his works did not progress, and no wonder that they have been ruins ever since they were begun! By the turn of the century, however, he seems to have been free again, and he proclaimed King James I. at Northampton on March 25, 1603. From this time till his death, which occurred some six weeks before the discovery of Gunpowder Plot in 1605, he seems to have been at liberty to pursue his favourite hobby; but then the final interruption came, and on Sept. 11 in that year he breathed his last. It was, perhaps, fortunate for him that he did so, for his eldest son, Francis, who inherited the estates, was already deeply engaged in the great plot, and it was he who wrote the well-known letter to Lord Montague, which was the means of revealing the whole affair. Francis himself was in prison before his father had been dead two months, and in prison he closed his ignoble life soon after the following Christmas.

Such is a brief history of the unfortunate gentleman who built the most curious buildings of his day. A few words as to his peculiar tastes and predilections, and then we will proceed to an examination of his architectural works. He was, first and foremost, a zealous Roman Catholic. Even before his formal return to the bosom of Mother Church, he was deeply imbued with her spirit, for in a room at Rushton is a plaster representation of the Crucifixion, dated 1577, and on it are some Latin verses which no Protestant could ever have written at that time. But many further proofs are found among the Tresham papers, which were accidentally discovered some forty or fifty years ago hidden away in a recess in a wall, as though thrust there hastily at the time that the great

\* A paper read by Mr. J. A. Gatch before the Birmingham Architectural Association on April 9.



frustrated Plot brought searching parties into all the Catholic houses in the land. The papers are worn away with damp and old age, but from among their brown and mouldy leaves can still be extracted a few rays of light to throw upon our building squire. Here we find letters from Roman Catholic priests, treatises on doctrines, notes on the religious controversies of the time, points of casuistry, as well as the draft of a petition of the lay Catholics of England,—all of which show Sir Thomas to have been consumed with a spirit of fervent Catholicism, which, indeed, his frequent imprisonments sufficiently prove, not to mention the fact that for twenty years he paid a yearly fine of 260*l.* for recusancy.

But another paper there is, bearing even more closely upon our present subject,—namely, some mystical notes on the Trinity, together with an account of a miracle that happened to him, which is interesting enough to us to warrant quotation:—

"If it be demanded why I labour so much in the Trinity and Passion of Christ to depict in this chamber, this is the principal instance thereof; that at my last being hither committed, and I usually having my servants here allowed me, to read nightly an hour to me after supper, it fortune that Fulcis, my then servant, reading in the 'Christian Resolution,' in the treatise of 'Proof that there is a God, &c.,' there was upon a wainscot table at that instant three loud knocks (as if it had been with an iron hammer) given, to the great amazing of me and my two servants,—Fulcis and Nik-ton."

What the 'depainting' in that chamber can only be guessed. But this, at least, we shall presently see,—that the Triangular Lodge sets forth the Trinity, and Lyveden New Building sets forth the Passion of Christ; and it may be that the 'depainting' was the preparation of his ideas for those two buildings, with which exercise he may have beguiled the weary hours of his captivity. But however this may be, it is quite certain that a man better known to fame than Sir Thomas Tresham had a hand in Lyveden New Building, and that was the architect, John Thorpe.

With respect to the exact share which John Thorpe had in these buildings of Sir Thomas Tresham, it is difficult to estimate it; but this, at least, is certain,—that in his book in the Soane Museum occur plans of the three floors of Lyveden; and they are plans which do not represent the building precisely as it now is, but rather have the appearance of being sketch plans, whereon the designer has tried various alternatives for different features. If Thorpe was the designer of one of the buildings, why not of all? especially as he was concerned at Holdenby, Kirby, and Burleigh, all in Northamptonshire, and all building about this time. The question is interesting, but probably impossible of solution. My own impression is that Thorpe carried out and put into practicable shape the ideas which Sir Thomas conceived. First, in the days of his freedom, the quaint, but matter-of-fact, Market House; later, after years of suffering and imprisonment, and brooding over religious subjects, those mystic buildings, the Triangular Lodge and Lyveden New Building.

After some remarks on the buildings, Mr. Gotch proceeded.—One of the conclusions that I have arrived at is that Sir Thomas was not an architect, but rather a lover of the art, who used it, in the first instance, to benefit his neighbours and gratify his sense of his family importance, which he shared in common with all the well-born of that age; and subsequently to express two ideas with which his soul was possessed,—the Trinity and the Passion of Christ. How thoroughly he expressed them you can judge for yourselves. He did it, not by appealing to the imagination, or by attempting to move the soul, for the mind thus vaguely stirred might have responded with ideas other than those two; but he did it by absolute visible signs, wrought in hard stone and mortar, and, indeed, in the very shape in which the hard stone and mortar were piled together. So painstaking has the designer been, that the elaborate way in which he has worked out his idea produces even a sense of the ludicrous. And this feeling is not checked (at least at the Triangular Lodge) by the beauty of the architectural detail, for, like much of the work of that time, it is unthought. Nevertheless, it is obvious that the man who designed the Lodge could design, and knew what he was about. At Lyveden, far from being unthought,

much of the detail is first-rate. The two exterior cornices are as well profiled as any that can be pointed out in any building of the time, and throughout the work there is much that would be useful and suggestive to the student of to-day. Notable in all three buildings is the excellence of the work. This is largely owing to the excellence of the stone of which they are built,—viz., Weldon stone, procured in the neighbourhood, and now, after some centuries of neglect, once more in the market, and as good as ever,—but largely also to the conscientious manner in which the work was done, the mortar being excellent and the joints extremely fine.

As to the position of these buildings in the architectural history of that period, they are of great value. They are exaggerated types, but it is often through exaggerations that we most clearly see the character of the normal type. There can be no doubt that the architects of those days strove rather to express ideas in their architecture than to meet and satisfy ordinary human wants. It was the clients who had to adapt themselves to the architecture, and not the architecture to the clients. The Triangular Lodge could, indeed, never have served any purpose beyond embodying the idea of the Trinity. But Lyveden was certainly meant as a dwelling, though an expensive and somewhat ill-contrived dwelling it would have been. The convenience of the inmates undoubtedly would have had to bend to the idea of setting forth the Passion of Christ.

Historically, their value is very considerable; practically, there are many lessons they can teach. Rothwell Market House is stately as it stands—roofless; if finished with the gables and the finials, which it was undoubtedly meant to have, it would be one of the most picturesque buildings of its time. Rushton Hall, with its broad treatment, its noble simplicity, and its quiet and sensible detail, might teach a much-needed lesson to many a man of our own times. The Triangular Lodge is too bizarre in all respects; but at least it offers a warning against triangular plans. Lyveden, too, while serving as a beacon in the matter of planning, abounds in useful and effective detail, and its bay-windows alone are enough to confer architectural distinction upon it. But beyond all this, must not be forgotten the ever-increasing beauty which the soft and kindly hand of time imparts to noble objects; and, if any here tonight have a few days to spare, they would be well rewarded by a visit to the thriving village of Rothwell, the stately hall at Rushton, with the Triangular Lodge in a distant corner of its grounds; or to the secluded fields where Lyveden New Building lies, just beyond the shadow of the woods.

#### STREET IMPROVEMENTS IN CONNEXION WITH THE STRAND.

SIR.—In speaking, at the Royal Institute of British Architects, to Mr. Stevenson's paper on the laying-out of new streets,\* Mr. Blashill challenged me to show that it was possible to make profitable such a scheme as I had advocated in the matter of reconstructing Drury-lane and the neighbourhood. I shall be glad of an opportunity to more precisely point out what I intended by what I said.

Following the lines of Mr. Waterhouse's Presidential address, I advocated that, in making improvements, large blocks of adjoining property should be taken, and not only narrow and inconvenient lines of frontage; in fact, that the public, instead of owners of surrounding land, should reap the advantage of the rise in value caused by outlay of public money.

I stated that I thought that there was a general feeling in political circles that the time had gone by when the owner of property was the principal person whose rights had to be considered, and that the extravagant compensations paid in the past would not be encouraged in the future.

I shall be safe, I think, in saying that there will not be a single metropolitan member to be found who will not support any well-considered scheme of public improvement. A very little knowledge of political life is sufficient to convince one of the immense change in general opinion on this point.

Whereas of old it was a standing maxim that any public body wishing to take land should be made to pay through the nose, now it will not

be difficult to ensure that any land wanted for public improvement shall be taken at a fair price. As materially affecting this, I may call attention to the prominent proposal to throw a great part of the expenses of improvements on the owners of property. I apprehend most people are agreed as to the justice of this, the only difficulty being as to whether it is possible to get at the owners, and, if so, how?

I will now take the profit and loss account of such a scheme as I advocate:—

**Loss.**—1. Value of buildings pulled down. 2. Value of site of buildings pulled down, that may be devoted to roads. 3. Reasonable compensation for disturbance and loss of goodwill. 4. Actual cost of making new roads.

**Profit.**—5. Increased value of building-frontages and sites. 6. Value of convenience to general public.

Items 2 and 4 may be dismissed as dead losses,—rather set against No. 6. The question remains to how far Nos. 1 and 3 can be balanced by No. 5.

A first consideration is necessarily the value of the buildings to be pulled down. If this is great, of course it is impossible that anything like a balance can be obtained.

In the case in point the buildings included in the part shown in my map are, with few exceptions, of the most trumpery and rotten character. Clare Market and the courts of this part of Drury-lane are among the worst parts left in the Metropolis, and there are at least a dozen places where houses have already had to be cleared away. I think I am justified in saying that the value of the buildings existing is about its minimum.

No. 2. The question of compensation for disturbance a good deal hinges on that which I have alluded to already,—the question whether the cost of improvement shall be partly paid on the owner of land benefited. It is obvious that it will materially affect the compensation, if the owner of property not absolutely necessary to the scheme can be offered his choice between selling and paying his special contribution. And this particularly affects the question of value of such parts as are not absolutely required for the roads. If he be a capitalist, he may perhaps prefer to take the latter course, in hope that the increased value to be given to his land will more than repay him.

Item No. 5. The value of building-frontage, &c., depends on whether the scheme is a good one, and really required. It is obvious that to obtain any great increase of value, the main street formed must be likely to become an important thoroughfare. Now, there can be no doubt that the street I show on the lines of Wych-street and Drury-lane (figs. 1 and 2) would be such a thoroughfare, as it would connect the Law Courts and the Strand with the Oxford-street and Tottenham Court-road, the great thoroughfare from the North. I pointed out at the Institute that there was no other chance of getting a thoroughfare through here, Covent-garden and the Opera House and Theatre will for ever block the way towards the West, and Lincoln's-inn does the same in another direction.

To the East, again, the much-needed opening through Chancery-lane to Gray's Inn-road is stopped by the great value of the buildings that would have to be destroyed. Most of these are of recent erection, and there is no doubt that if the present opportunity to acquire Drury-lane is lost, buildings will soon be erected in the neighbourhood that will enormously increase the expense at any future time. I think there can be no question but that the building frontage of this new street would be immensely increased in value, as the street would undoubtedly become a great thoroughfare.

With regard to the other value, it should certainly be higher than the present, though as it would be necessary to devote a large portion of it to workmen's dwellings, the increase in value should not be reckoned.

Mr. Blashill did not say if he included in his statement an estimate of the prospective value of the property when the building-leases have run out. Of course, there can be no question but that immediate profit cannot result from the operation.

I am aware that from the point of view of an ordinary individual it is really more profitable to build on a long leasehold than on a freehold, but the case is quite different as affecting a landlord who is of a permanent character like a municipal body, or even a ducal

\* See *Builder*, pp. 241-32, ante.





Fig. 1.—General plan as existing.

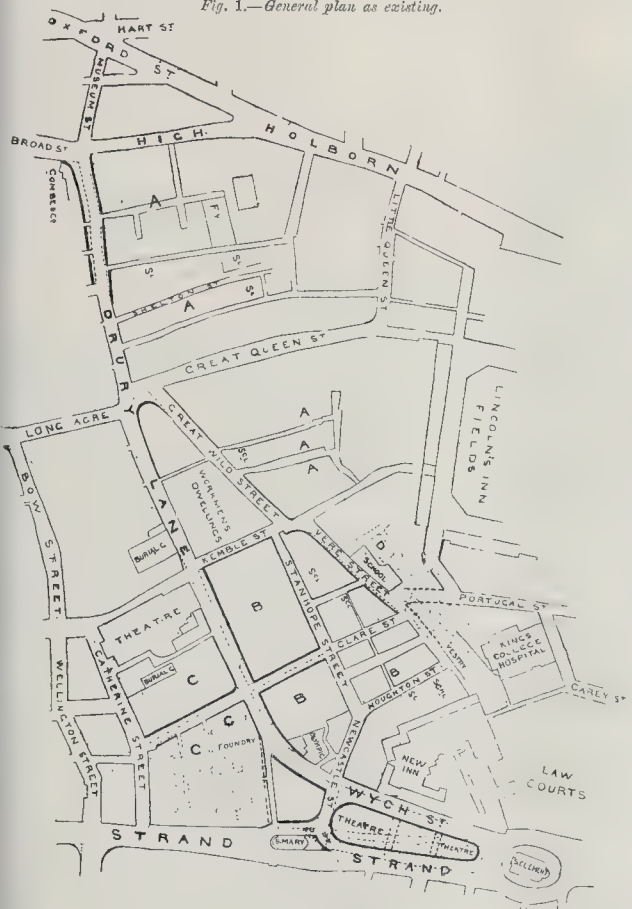


Fig. 2.—Proposed alterations.

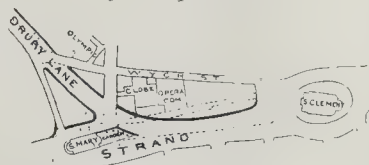


Fig. 3.—Alternative plan.

family. As a financial transaction it would probably pay the Duke of Westminster or Earl Cadogan better to leave their properties as they are, and get all they can out of them and invest that in other ways and keep it accumulating. But there is the well-understood difficulty that such investments and accumulations may be spent at any time and leave nothing behind them. In the same way, probably, no insurance can be financially profitable to any but a short-lived man, were it not that it is secured by investments of small sums that would otherwise be wasted. There would be grave objections to a municipal body spending money merely for the sake of future profit, and it should be a requirement that there should be a real necessity for anything done.

I cannot help thinking that Mr. Blashill left out of consideration that in a hundred years' time the metropolis will have paid for the debts of its improvements, and will come into possession of a splendid and remunerative property. Undoubtedly great care should be exercised in the selection of localities for improvements, as it is not certain that values everywhere will keep up; but central positions, such as that now under consideration, must always maintain their value.

I have not spoken of the value of the leases, nor of the goodwill. Considering the nature of the property, the former merges in the freehold, as there is a very small value of buildings apart from site.

A last word as to compensation. If, apart from the value of buildings, the amount of this shows a large balance on the wrong side, it surely proves that the award has been an unfair one. As long as surveyors prefer the lucrative position of advocates to the more honourable one of experts, there will, doubtless, be great difficulties in keeping down the bill; but I repeat that the basis on which this compensation will be awarded is now more favourable to the public.

If private individuals can make a large profit by buying the Marquis of Salisbury's Strand estate, pulling down buildings and leaving open spaces, there must be something very wrong if the County Council, who can borrow money at 3 per cent., cannot carry out a more moderate scheme without a great loss.

As the Council cannot take the risk of loss, they cannot, of course, expect large profits, but between large profits and large losses there is surely a margin of safety.

As the buildings to be taken mostly stand in danger of immediate sanitary condemnation, I advance that the expense in this case will be particularly small. I am not, however, Utopian enough to suppose that practically the matter would be carried through without a great waste apart from the investment; but I do maintain that it can never be done so profitably as now, and that as it must be done somehow or another, or sometime or another, it can be done much more profitably on a large scale than on a small one, and now than at a future date. I hold also that the eventual profit when the building leases fall in will be a large one.

The accompanying map (Fig. 2) is to show the general bearings of the proposal on the question of through routes. Schemes could easily be made that would look much better on plan, but it would be found that the value of buildings to be demolished presented great difficulties.

In this plan, only buildings of trampy character are required, and the plan is founded on study of the locality, not of the map only.

It should be noted that a route to Fleet-street alternative to the Strand is provided from Piccadilly-circus by way of Long Acre. Not only would this be actually shorter in distance, but the dip to Charing-cross would be avoided.

With regard to Drury-lane, the narrow end at the top requires widening and the small shops rounding off as far as Combe's Cooperage. The main traffic would go round this corner, up Broad-street to Tottenham-court-road.

On the east side of this top part of the lane, marked A, the property is mostly of ramshackle character; indeed, Shelton-street is in process of being taken down. There is room here for considerable rearrangement.

Lower down, the angle of Great Queen-street wants taking off, so as to ease the Long Acre traffic. This is already important, and if Queen-street be ever opened into Holborn, will become still more so. The public-house at the corner might, if necessary, be left as an island.

The present road at this point would serve, as it can hardly be widened. It is a pity the dwellings were not kept back 3 ft.

The block below the dwellings on the east side, marked B, as far as the Olympic Theatre, is one of the worst in London, and would probably have gone long ago, but for the difficulty of housing the people in the meantime. There is space here for large blocks of workmen's flats, though it is to be hoped that the frontage would be reserved for more profitable and lively purposes.

On the west side is a similar bad property, C, which also wants reconstructing.

By taking off an angle of Vere-street, and clearing away the half-demolished Clare-market, a very sufficient approach to Carey-street can be readily obtained.

Experience has shown that there is very little carriage traffic of any sort to the Law Courts, and special provision for such is not required.

Bear-yard, marked D, is already tenantless.

I have purposely refrained from introducing any scheme for a road due north to Holborn, as it opens fresh questions. The entrance of such to the Strand would doubtless be by Newcastle-street, with such a rearrangement of gradient as shown.

There are two ways of bringing Drury-lane into the Strand. The first and best is, undoubtedly, by widening Wych-street, as by this means the difficulty of gradient is avoided. This would involve the destruction of the Globe and Opera Comique Theatres, and the whole block between Wych-street and the Strand. In place, thereof, a substantial new plot would be gained, particularly suited for erection of new theatres, which might be isolated. The alternative plan shows how the theatres could be avoided, but there would be a steeper hill at the end, and it is generally supposed that the theatres would be disappointed if they were not taken.

#### Alternative.

In any case, the garden of St. Mary's might be taken away with advantage to appearance. The beautiful porch and steps would be better seen, and the new buildings westward of it would not have to be taken. My arrangement of the gradients would involve a small garden on the east side (fig. 3). This part of the scheme must necessarily be very expensive; but I take it that there is a general agreement as to the necessity of a sacrifice being made to improve the Strand.

My object has been to point out how, if the plan be adopted at once, and the necessary buildings scheduled, it can be done with hardly any waste. As an instance of the fatal effect of procrastination, one may note that a good deal might have been saved by bringing the new line through the Olympic, which is ripe for demolishing, and leaving untouched the blocks on the south. A building erected within the year now stops the way.

Mr. Blashill is a great deal better qualified than I to deal with the details of such a scheme, but I am most anxious to point out the importance of joining to any scheme for the improvement of the Strand the question of access thereto, and the further possibility of finding sites for workmen's dwellings, for the provision of which the majority of the County Council are so deeply pledged.

RALPH NEVILL, F.S.A.

P.S.—I have not alluded to the alternative of enlarging Wych-street on the north side by taking part of New Inn, since there are understood to be legal difficulties. If, however, as has been sometimes hinted, Government would at some time require to take the Inn for extension of the Law Courts, the obvious course would be to widen on this side.

Since this paper was written,\* several allusions have been made to the plan proposed some years ago by Mr. Hayward. This could at the time have been carried out with ease and great advantage. Unfortunately now there would be very little frontage opened up by it, and there are new buildings in the way. A large electric-light works has been erected within the last few months on the north side of Sardinia-street, just where the road should have come. I fancy the road between the Law Courts and New Inn has ceased to be possible.

At the time of Mr. Hayward's plan it was, moreover, thought that there would be a large traffic to the Law Courts, which has not been the case. A sufficient road could be brought from the end of Little Queen-street into the middle of Stanhope-street, to Newcastle-street.

\* We should say that Mr. Nevill's plans and letter were in our hands and prepared for publication last week, but were unavoidably postponed for want of space.—Ed.

Access could also be provided by removing the block at each end of the west side of Lincoln's-Inn-fields, and cutting off the corner of, and slightly widening, the north side of Houghton-street, which has some important buildings on the south side.

## Illustrations.

### THE MODERN HÔTEL DE VILLE, PARIS.

WE give illustrations, reproduced from photographs, of several portions of the Hôtel de Ville at Paris which have not been before illustrated in our pages. They include a view in the South Court showing as a prominent object the stair turret in the angle, a view in the Salle des Prévôts, and a view of one of the "Escaliers des Fêtes," looking from the balustrade of the "Salle des Caryatides." All these are further described in the first article in the present number.

The building was designed, as our readers will remember, by MM. Ballu and Deperthes, whose designs were selected in a competition; the first-named architect unhappily did not live to see the completion of the building.

### A LONDON BOARD SCHOOL: LATCHMERE-ROAD.

THIS was the last school built under the direction of Mr. E. R. Robson before his retirement from the position of Architect to the School Board for London, and we give tolerably complete illustrations of it as a typical specimen of the London Board School.

The plan is arranged on the central hall system, and shows some of the special objects kept in view in the arrangement of these schools: side lights as far as can be arranged for; though it is seldom possible to carry this out completely through the whole building, and, as will be seen, it has not been done in this case; where the lights are not at the side they are behind: girls' and boys' entrances in different streets and entirely separated: separate rooms for cloaks, bonnets, caps, &c. (very important in bad weather where these, if hung up in the school-rooms, bring in damp and smell): infants' school on the ground floor, girls' above, and boys' at the top, the boys being supposed to be better equal to the fatigue of stair-climbing. The plan of the boys' school is not given, as it is practically identical with that of the girls' school.

The positive lines on the class-room floor show the position of the raised steps, the dotted lines in the other direction the groups of dual seats, with gangways between. Desk-room appears to run to about 20 in. per child, according to scale; the generally-accepted scale is 18 in. for juniors and 22 in. for seniors. The stairs are kept to short flights, with no winders—an important point where they are to be used by a crowd of children. Class-rooms are never on any account to be passage-rooms. The rooms are 14 ft. high, the maximum height considered necessary. The warming of the class-rooms is by open fireplaces.

The elevation is a fair specimen of the architectural style which Mr. Robson to a considerable extent may be said to have invented for these schools; some of those which he has designed are, to our thinking, a good deal more picturesque than this one. It has however the merit, in regard to architectural expression, of looking like a school, and the nature and intention of the building could hardly be mistaken.

### ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE following gentlemen, having satisfied the examiners, at the examination held in London on the 29th and 30th ult., as to their fitness to become municipal engineers and surveyors to Local Boards, have been granted certificates of competency by the Council of the Association, viz.:

|                              |                                |
|------------------------------|--------------------------------|
| J. H. Blizard (Southampton). | H. Nettleton (Leeds).          |
| J. W. Bradley (Burnley).     | W. Stringfellow (Southampton). |
| G. F. Carter (Leeds).        | W. J. Taylor (Southampton).    |
| W. B. Dixon (Wolverhampton). | G. B. Tones (Eastbourne).      |

The next examination will be held in London in October.

### ARCHITECTURAL ASSOCIATION VISITS.

THE members of this Association on Saturday last visited the workshops of Mr. J. Starkie Gardner, on the Albert Embankment, where they saw the actual operations of the art metal-workers' craft, Mr. Gardner having kindly induced several of his workmen to forego their usual Saturday half-holiday for this purpose. The drawing-office was first inspected, and the method of preparing the full-size working details necessary for the carrying out of designs for metal-work explained by Mr. Gardner. Then the workshops were visited, and the various operations of welding, forging, shaping, drilling, sawing, and fitting were exhibited, so as to give the visitors an idea of the relative costliness of the various operations. The finishing-shop was then inspected, and the various methods of completing work were seen, such as bright and blacked iron, gilding, and brass finishing. Specimens of work in all stages were exhibited and explained, and the various points of interest noticed. The visitors then proceeded, under Mr. Gardner's guidance, to his workshops at Vauxhall, where, in addition to metal-work, the processes of Mr. Clement Heaton's cloisonné mosaic were explained by that gentleman. The capabilities of this novel method of wall-decoration were put before the members, and work shown in all stages. This invention is based on the well-known cloisonné method of enamelling, the divisions of the pattern being formed by thin strips of copper soldered to a metal plate, the interstices are then filled with a colouring matter formed of marble dust and resins, which are liquefied by heat and laid in by hand. The surface is then smoothed by a knife, and afterwards polished, forming a durable and beautiful method of ornamentation. The limitations of the material appear to us to forbid the attempt at highly pictorial effects, but as ornamentation for wall surfaces there seems to be a great future before the invention. Some examples of enamel in the Limoges method were also exhibited by Mr. Heaton, and were much admired.

### THE EGYPT EXPLORATION FUND.

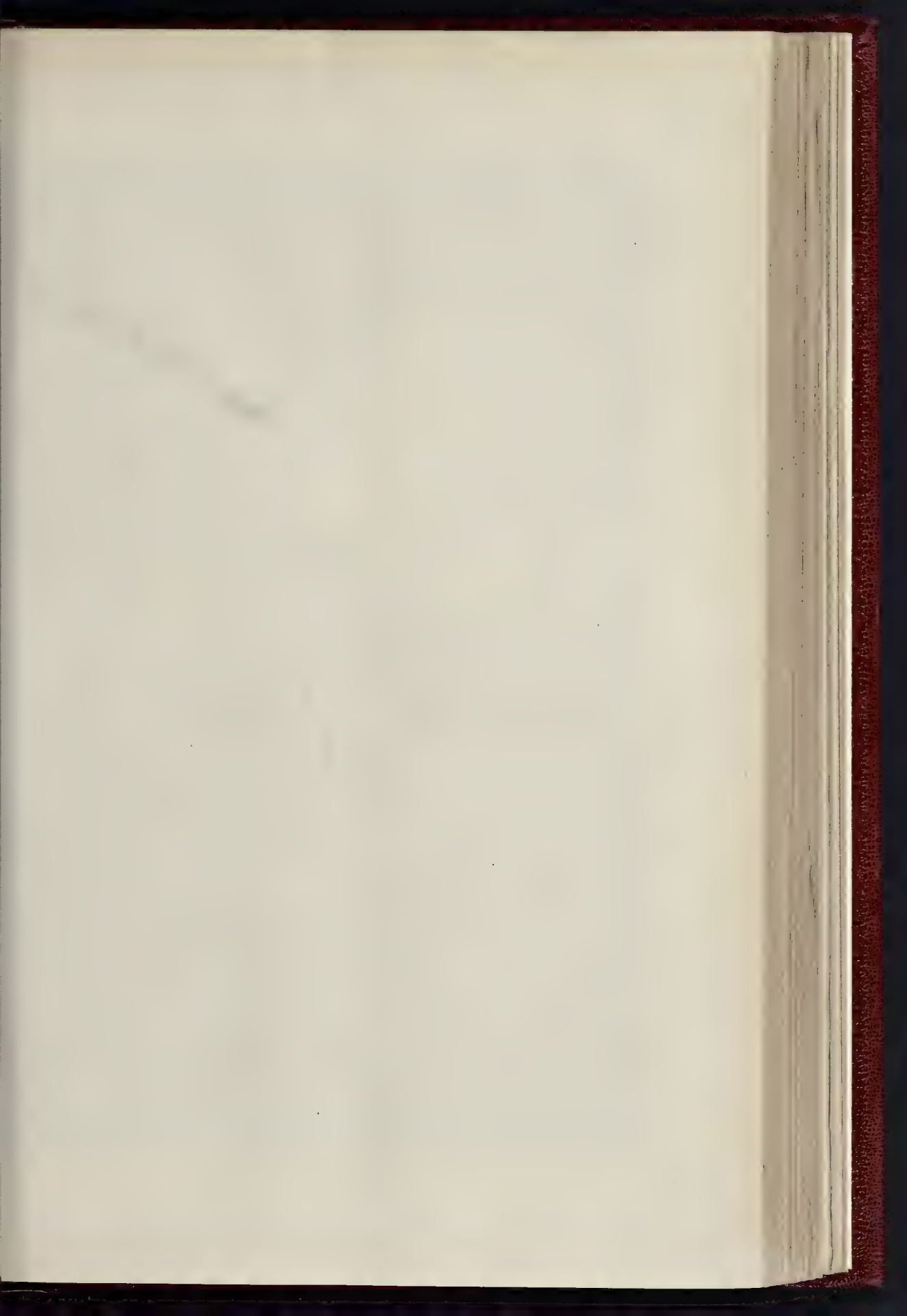
THERE was a good attendance of the members of this Fund at the second ordinary general meeting,\* which was held on the 12th inst. in the Hall of the Zoological Society, Hanover-square.

Sir John Fowler, the President of the Fund, occupied the chair, and after the transaction of some routine business, the hon. treasurer presented his report, which showed that the total expenditure of the Fund for the twelve months covered by the report in carrying on the excavations on the sites of the ruined temples in Egypt has been 2,348l.; of this sum, £1,564l. have been spent on Mr. Naville's explorations on the site of the Temple of Bubastis. The total receipts have been 2,500l. From America no less than 1,200l. out of that amount has been received in the shape of subscriptions. England contributing the remaining portion of 1,300l. The balance at the bank has, however, been reduced to the sum of 1,282l., which is a considerably smaller amount than it was at this time last year. The reduction is chiefly on account of the cost of transport from Egypt to England and other places of the heavy antiquities, and providing for the excavations to be carried on next season.

Miss Amelia B. Edwards, the well-known authoress, next presented her report as hon. sec. to the Fund. She said that all, or nearly all, that the ruins of the great Temple of Bubastis had to yield in the way of sculpture or architecture had been laid bare by the excavations carried out by M. Naville during the past two seasons. As a matter of fact, the *dissecta membra* of the great temple were found *en masse*,—buried in one grave, so to speak. Of the remains which had not been brought away every block had been lifted and examined on all sides for inscriptions; every inscription found had been copied, and casts had been taken of every bas-relief found. Among the inscriptions found were recorded the names of the builders of the Great Pyramid, and of the second Pyramid of Gizeh. Since the meeting of the Fund in May last year, 211 new European subscribers had joined the Fund, and the number of local honorary secretaries

\* This was in reality the sixth annual meeting, but only the second since the incorporation of the Fund, which was founded in 1853.





THE BUILDER, APRIL 20, 1889.



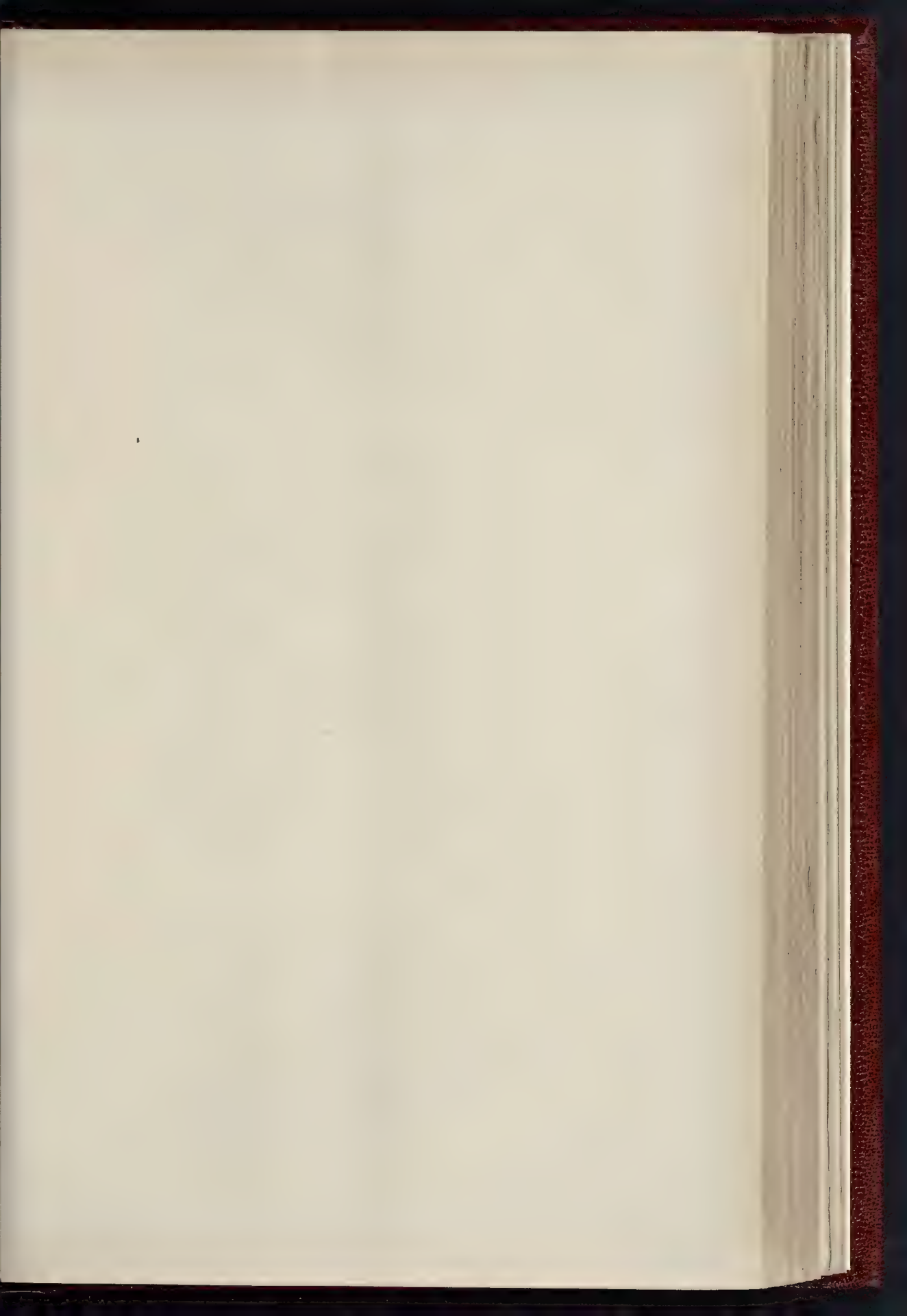




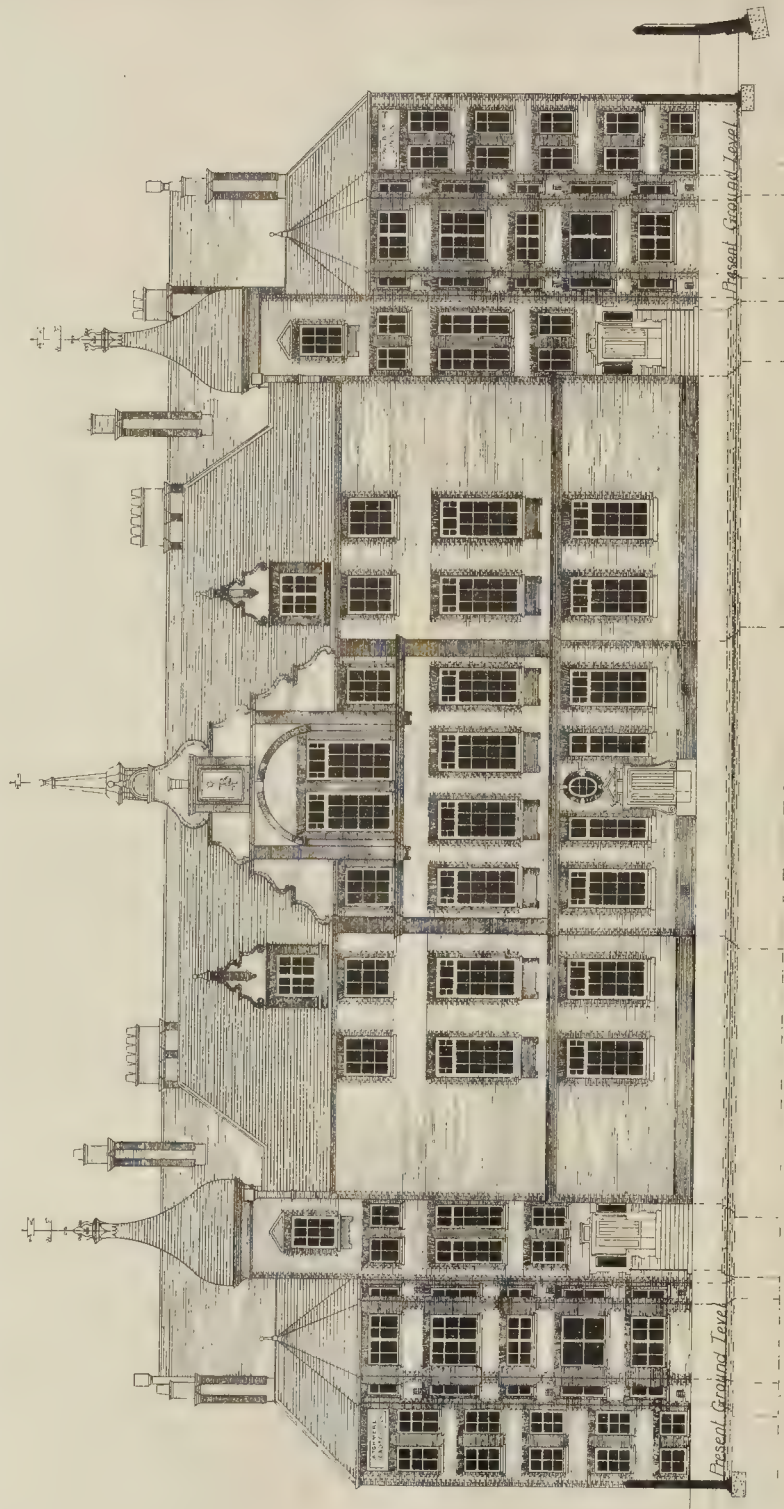
HÔTEL DE VILLE, PARIS. MM. BALLU AND DEPERTHES, ARCHITECTS.  
STAIRCASE IN SOUTH COURT.

THE BUILDER, APRIL 20 1889.



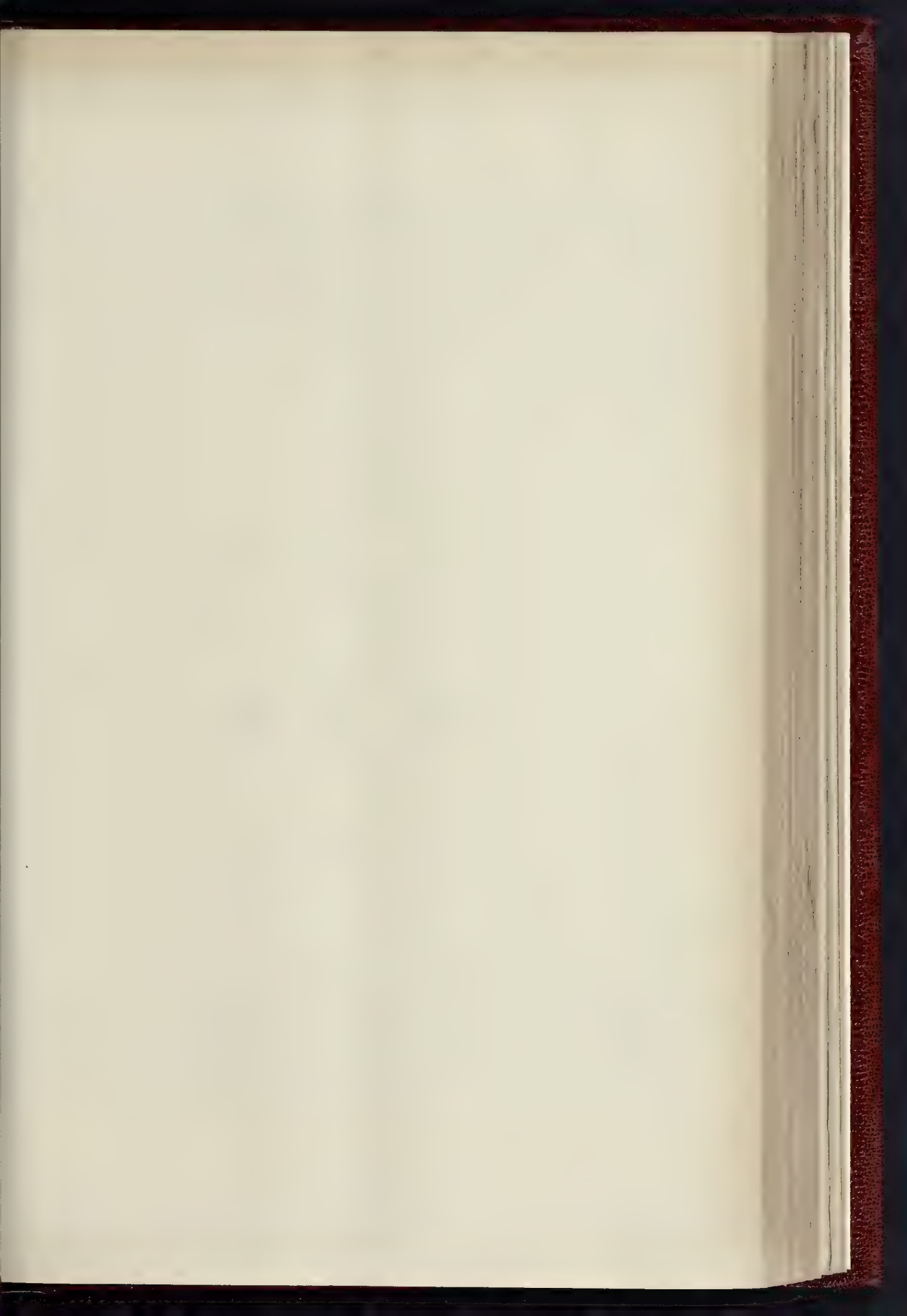


THE BUILDER, APRIL 20, 1889.



South Elevation





THE DO. SUR. APRIL 20, 1889.





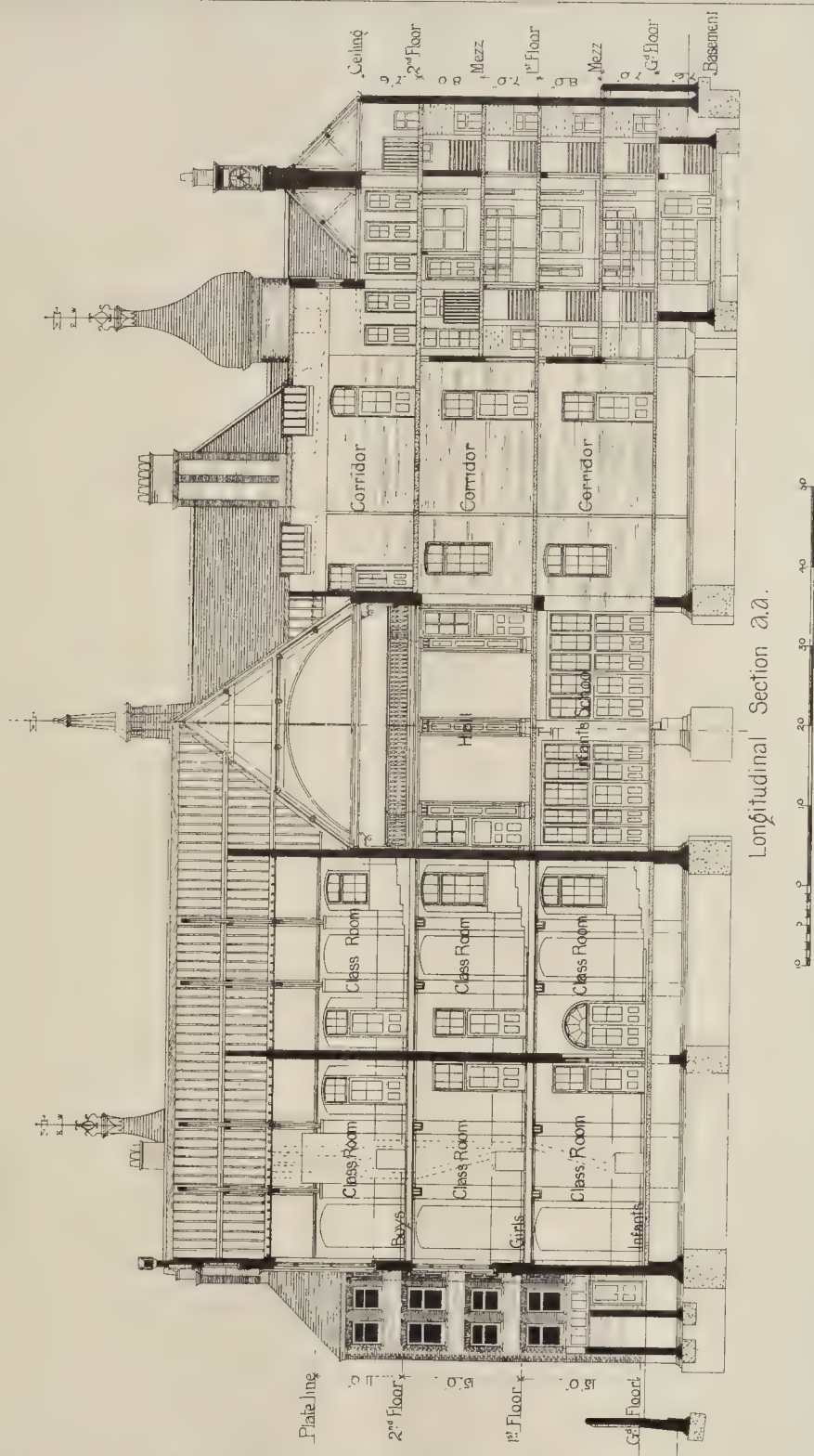


HÔTEL DE VILLE, PARIS. MM. BALLU AND DEPERTHES, ARCHITECTS

ESCALIER DES FÊTES







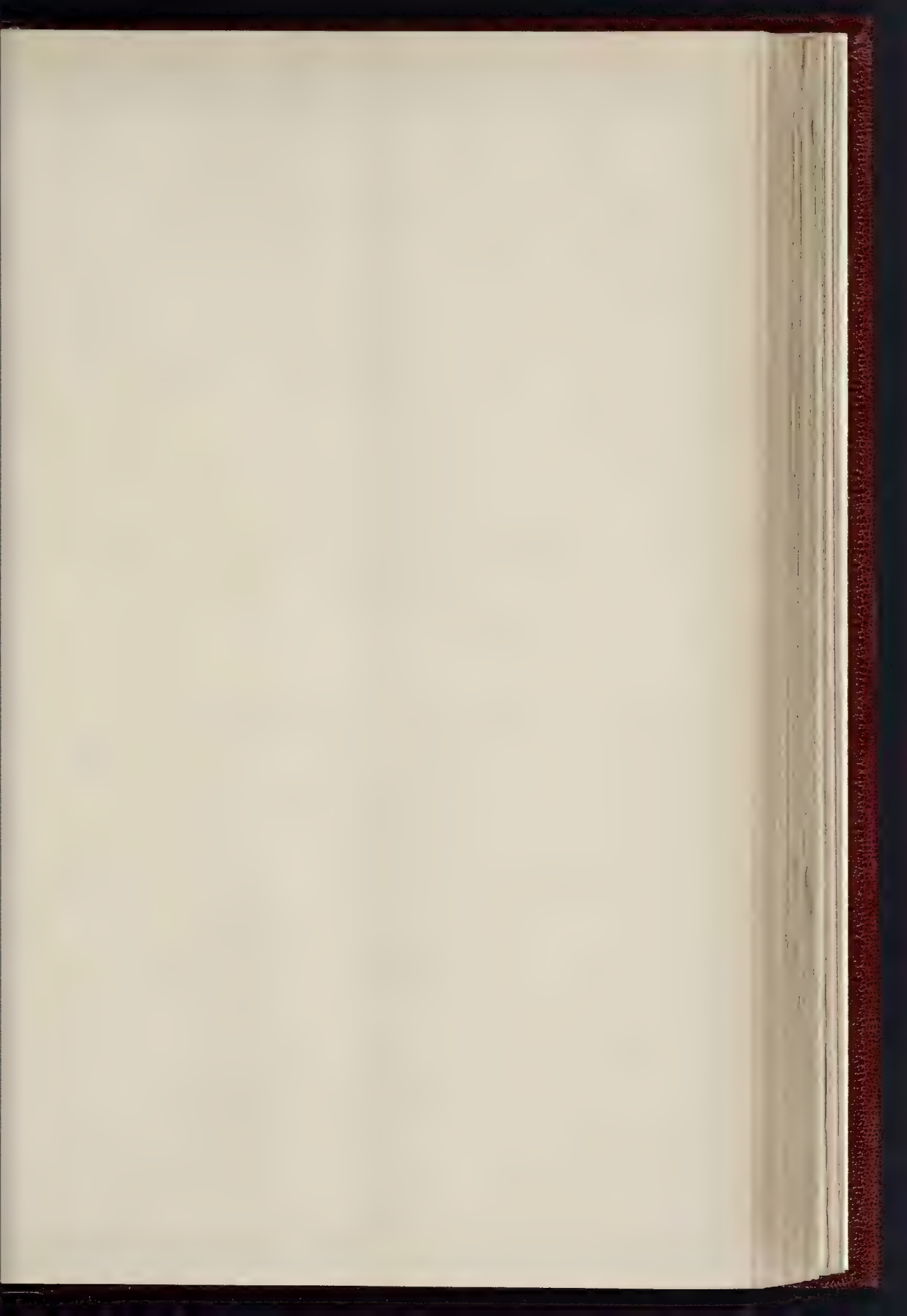
Longitudinal Section a.a.

NOTE: THE SPACED & 1/2" PARTING LINE CANNOT BE EXACTLY 1/2"

A LONDON BOARD SCHOOL (LATCHMERE ROAD, LAMBETH).—MR E. R. ROBSON, F.R.I.B.A., ARCHITECT.











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PHOTO LITHO. SPRACUE & CO 22, MARTIN'S LANE CANNON ST LONDON, E C

A LONDON BOARD SCHOOL (LATCHMERE ROAD, LAMBETH).—MR. E. R. ROBSON, F.R.I.B.A., ARCHITECT.





had been increased by eleven, making the total number now thirty-seven, all of whom were doing excellent work in spreading the reputation of the Fund, and in adding materially to its resources. Miss Edwards then, at the request of the Chairman, went on to describe the monuments from Bubastis, which arrived a few months ago at Liverpool on board the *Marceitis*. It was thought better by the Committee that they should be inspected at Liverpool, so as to avoid the expense and risks attendant upon the transport of the whole mass to London, especially as Liverpool was most convenient for the ultimate transport of such of the fragments as were to be consigned to America.\* On arriving at the Huskisson Dock, in company with Mr. Hellier Gosselin, one of the hon. secretaries of the Fund, Miss Edwards found twenty-seven large cases of fragments. These cases all had to be opened and their contents examined. At another dock Miss Edwards found a very large number of granite sculptures lying about without cases or any other protection from the weather. These sculptures included a magnificent lotus-bud capital in two pieces, each from 12 ft. to 14 ft. in length, and perhaps 5 ft. in diameter; a colossal torso in red granite, about five times the size of life, and bearing on it the cartouche of Nectanebo I., and other important fragments. On inquiring how it was that these remains were in their then unprotected condition, Miss Edwards learned that they had been packed in cases for transport from Egypt; but, after had taken on board a certain number, the captain of the *Marceitis*, having regard to the safety of the ship, refused to take any more on board; consequently some of the larger masses of granite were unpacked, and, to meet the captain's views, they were comfortably bedded in the hold of the ship in the midst of a cargo of beans, where they rode very comfortably, but from which they were necessarily discharged without any covering. When all the cases referred to were opened, Miss Edwards said she was amazed at the splendour, beauty, and variety of the sculptures. Some of them were really masterpieces. Those who were only familiar with the type of Pharaoh to be seen in the British Museum had no idea of what the Egyptian sculptors of the oldest and best period could do in the way of originality and character in the facial expression of their figures. It was impossible to look on one of the colossal faces brought to Liverpool without recognising the Mongolian type of countenance in its most marked characteristics. In conclusion, Miss Edwards said that if the Committee of the Fund had spent a great deal of money on the excavations at Bubastis, they had obtained a great many treasures as the result of their work.

Miss Annie Barlow having given an amusing account of a recent tour in Egypt in connexion with the operations of the Fund,

Miss Edwards proceeded to describe the works allotted to the various museums of the world. The following is her list:—

*To the British Museum* there were awarded (1) a fine column of the Egyptian palm order, in polished red granite, with palm capital, shaft and base complete, the shaft inscribed with hieroglyphic characters. (2) The upper half of a colossal statue of a king in red granite, archaic style. (3) Three large fragments of a shrine in polished red granite, beautifully sculptured in very low relief,—period of Nectanebo I., XXXth Dynasty. (4) A large slab of red granite, carved in bas-relief with portrait, figures of King Osorkon II., and his wife, Queen Karoama,—XXth Dynasty. (5) A colossal statue in polished black granite of the celebrated Hyksos King Apepi, in four pieces, the finest work of this period ever discovered, — a priceless monument, both historically and as a work of art; the finest piece of Egyptian portrait-sculpture known. (All these are from the Great Temple of Bubastis.)

*To the Museum of Liverpool*.—A colossal portrait head of Ramesses II., in red granite. (From the Great Temple of Bubastis.)

*To the Owens College Museum, Manchester*.—A colossal portrait head of Ramesses II., in red granite. (From the Great Temple of Bubastis.)

*To the University of Sydney, New South Wales*.—The capital of a red granite column, sculptured on two sides with a colossal head of the goddess Hathor. (From the Great Temple of Bubastis.)

*To the City of Geneva*.—A statue of Ramesses II.

\* It should be stated here that the Egypt Exploration Fund is an international society, the American subscribers trusting to the judgment and liberality of the British Committee in the distribution of the sculpture and other remains found.

enthroned, of heroic size, in polished black granite, in two pieces. (From the Great Temple of Bubastis.)

*To various Local Museums* in other parts of Great Britain.—Donations of sculpture.

*To the Museum of Fine Arts, Boston, U.S.A.*.—(1) The capital and part of the shaft of a very large red granite column of the Egyptian lotus bud order, unpolished. (2) A very large colossal head of the goddess Hathor, quite perfect, in red granite, unpolished. (3) A red granite slab, sculptured in bas-relief, with a scene of religious ceremonial. (4) The upper half of a colossal statue of a king, in red granite, archaic style. (All the foregoing are from the Great Temple at Bubastis.) (5 and 6) Two slabs of limestone, carved in bas-relief, Ptolemaic school. (From a Temple built by Ptolemy Soter, at Terraneh, in Lower Egypt.)

Mr. E. Maunde Thompson, on behalf of the Trustees of the British Museum, returned thanks for the gifts which the Fund had made to that institution, and expressed regret that his colleague, Mr. Lepage Renouf, the Keeper of the Egyptian Antiquities, was unable to be present.

Professor R. S. Poole, of the British Museum, proposed the various presentations already mentioned to the City of Geneva, to the University of Sydney, to the Museum of Liverpool, and to the Owens College Museum, Manchester. Professor Poole incidentally remarked that the supporters of the Fund owed much to Switzerland, which had given the world M. Naville, an Egyptologist of the first rank.

Mr. H. H. Howorth, M.P., in seconding the motion, said he should be glad if the Fund could see its way to take some steps to have the Egyptian remains *in situ* properly protected from the ravages of tourists. He also thought that the Fund should try to undertake the work of copying many of the uncopied inscriptions discovered in Egypt, and thus form the nucleus of a *corpus inscriptionum* which would be of great value to the Egyptologist. Unfortunately, antiquities discovered in Egypt rapidly perished by decay or cupidity unless taken to the Museum at Boulaq.

The Chairman said he cordially agreed with the suggestions of Mr. Howorth,—particularly with that regarding the preservation of the inscriptions.

Sir Charles Nicholson, having returned thanks on behalf of the University of Sydney,

Miss Edwards moved, and Prof. R. S. Poole seconded, the presentation of the gift to the Museum of Fine Arts, Boston. This gift was spoken of by Miss Edwards as consisting of the very flower of the antiquities discovered by M. Naville.

This having been carried, Mr. White, Secretary of the United States Legation, replied, expressing his sense of the generosity with which the Committee of the Fund had treated his country.

The donation to Liverpool was *put pro forma* from the chair and agreed to, and on the motion of Prof. Poole, seconded by Mr. E. A. Bond, C.B., the thanks of the meeting were tendered to Sir John Fowler for presiding, and for the zeal with which he had fulfilled the duties of President of the Fund in succession to the late Sir Erasmus Wilson.

#### THE BAGSHOT SANDS IN RELATION TO HEALTH.

A PAPER on this subject, by Mr. Alfred Haviland, was read at the Sanitary Institute on Thursday, the 11th inst. In introducing the subject the lecturer dwelt upon the fact that the student of medical geography is constantly meeting with coincident facts, associating certain local climates and certain diseases together, and that the constant recurrence of these coincidences often sorely tempts him to view the climatic fact and the disease fact in the relation of cause and effect. Ague and cholera were given as instances; but even the fen climate, and that of the swamps of the Ganges Delta, in the absence of our ability to point to the real producer of the specific disease in these climates, can scarcely be considered to be the causes of the diseases which affect those subject to their influence, the specific poison concerned in the genesis of those diseases having hitherto eluded our grasp. Nevertheless, we are bound to take cognizance of coincident facts connecting local climates with certain diseases. One cannot ignore the coincident climate facts and disease facts, as shown by the lecturer in his maps of the geographical distribution of heart disease, cancer, and phthisis.

In the pent-up valley systems of Great Britain, where the prevailing winds were shut out and air-flushing imperfectly brought about, there was to be found, without exception, the greatest amount of heart disease and low forms of rheumatism (not rheumatic fever). These are coincident facts.

The lecturer had made another investigation with regard to the wheat yield, as estimated by the number of bushels per acre, from data extending over England and Wales, and embracing a period of twenty-five years; the result of which inquiry being the formulating the proposition that whenever the mortality from heart disease was highest there was to be found the lowest wheat yield, and *vice-versa*.\*

The local climates coincident with the highest and lowest death-rates from phthisis and cancer were then dealt with, and the distribution of the last disease led to the geological fact that there is a general tendency in the geological record, in the strata from the oldest to the most recent, to alternate in character from below upwards, from permeable sands, gravels, and limestones to retentive clays, and then again to permeable formations, which are again succeeded by others equally impermeable. A long diagram, consisting of a geological section from the source of the Thames to the North Downs, was exhibited, by which it was shown how those strata succeeded one another along the valley of the Thames, and how this river and its tributaries had succeeded in cutting through the permeable to the retentive or clayey strata, so that the bed of the river and the riparian districts consisted principally of the retentive clays; whereas the water-parting or more elevated districts, where the Thames and its branches had their sources, were characterised by the permeable strata, the effect of which on such a disease as cancer was then pointed out.

Among the elevated permeable strata were the Bagshot sands, which the lecturer remarked were characterised by an alternation of permeable and retentive beds. This was further explained by three coloured geological sections: No. 1, from the Fox Hills, across the Chobham Ridges, to near Bagshot; No. 2, from Cobbett's Hill to Cove Common, cutting through the Fox Hills and the outline of Upper Bagshot Sands, on which the North Camp at Aldershot was situated; and No. 3, from Blackdown, Wykeham Park, through the valley of the Middle Bagshot beds, the Blackwater River, the North and South Camps, the Cavalry Barracks, and Aldershot.

Mr. Haviland then pointed out that the greater part of the encampment stood on the middle Bagshot beds, characterised by clay and peat. The lecturer then commented on the health of the troops stationed there from data as regards general health and some special affections, as rheumatism and diseases of the respiratory organs, kindly supplied to him through the courtesy of Sir Thomas Crawford, head of the Army Medical Department, Surgeon-General Johnston Ferguson, and Brigade-Surgeon Scott, to whom his best acknowledgements were due.

In conclusion, the lecturer remarked that the Bagshot sands had a high reputation for healthiness, but that this reputation had been gained by the sandy members, such as the upper and lower. This reputation would be maintained if, in the southern part of the Thames Basin, the upper sand-beds were selected for habitation, provided they were planted with pines and forest trees, as had been successfully carried out for more than thirty years on the western slopes and heights of the Chobham and Frimley ridges.

#### Competition: Congregational Church, Prenton.

—We learn that in a recent limited competition for a new Congregational Church and schools to be erected at Prenton, Birkenhead, the designs of Mr. Thomas W. Cubbon, architect, Birkenhead, were selected. The scheme includes a church capable of accommodating about 584 persons, and also schools to accommodate 200 scholars. The scheme will not be carried out in its entirety at once, it being intended to use the schools for congregational purposes in the first instance, which latter will be completed without delay. The total cost of the entire scheme is estimated at about £4,500.

\* The Times, Aug. 14, 1886; Bell's Weekly Messenger and Farmer's Journal, Aug. 25, 1886; the Farmer and the Chamber of Agriculture Journal, Aug. 9, 1886.



## MR. W. BLISS SANDERS ON "WOOD-CARVING."

THE second of a series of lectures, inaugurated by the "Home Arts and Industries Association," in aid of the funds of the Design Committee, was given on Friday, April 12, in the Theatre of the Albert Hall, by Mr. W. Bliss Sanders, author of "English Woodwork of the Sixteenth and Seventeenth Centuries." Lord Wentworth was in the chair. In the course of the lecture, Mr. Sanders said that with regard to the technical side of the question, carving might be divided into two classes: first, flat carving, with its effect of light and dark, which is the general characteristic of all barbaric carving,—the raising of surfaces, massing them, and carving them requiring more skill than the primitive carvers were possessed of. The system of severe contrasts produced by the simpler work is extremely pleasing, and for many purposes is very valuable. It may be seen in the Scandinavian crosses, and in much of the strapwork peculiar to the Elizabethan period.

The second is that of light, shade, and shadow produced by raising the surfaces from the ground, and modelling the ornaments according to the conditions imposed.

The open or fret-cut carving might also be specified, although the carved part is treated in the same way as the second class. It is used for screens in churches, and occasionally on domestic furniture, when it is backed up by some textile fabric. The old workman acquired great facility of simple expression, apparently by keeping only one idea in his mind at a time. The lecturer then showed an interesting example of a German chest, in which, he said, the design, though affecting a likeness, showed a good deal of difference in detail, which is always desirable. In nature there is wonderful symmetry and balance, but no regularity; the leaves start from a parent stem,—a point which should never be lost sight of in designing, or else a disjointed design, without repose, is the result. Carving should never detract from the use of the object, or weaken its construction. To construct decoration, instead of decorate construction, is one of the greatest crimes an architect can commit. Old carvers were very reticent, rarely carving more than the top panels of a room, and that with some simple pattern, reserving their strength for the fireplace, so that the eye might have some plain surfaces to rest on. The use of glass-paper was most mischievous, for it obliterated the mark of the tools, taking away all life and vigour, and leaving nothing but an inert mass of dulness behind. The treatment of the ground was always rather a difficult matter. As a background it should neither obtrude or detract from the subject to which it is to call attention, but should blend the whole design together. The hard mechanical punching which made the ground appear quite apart from the carving, which looked as if it might have been applied, was most pernicious. Whether the ground should be left plain or slightly diapered depended entirely on the character of the design.

The lecturer said he looked forward to a day when the State would provide an institute for the carver, furnished with the best examples of ancient and modern woodwork, a reference library, and a staff of duly-qualified masters, for construction, design, and carving, assisted by the advice of the great artists of the day. The lecture was illustrated by a series of very interesting magic-lantern slides, as well as by a few specimens of old examples.

## Birmingham Architectural Association.

A meeting of this association was held on Tuesday, April 9, at which a paper entitled "A Building Squire of the Time of Elizabeth," was read by J. Alfred Gotch, Esq., F.R.I.B.A. The paper, which we print in another column, was illustrated by drawings of Rothwell Market-house, the triangular lodge at Rushton, and Lyveden New Building; and by lantern-views of various parts of the same buildings, and of Dingley and Kirby Hall; and by the aid of these and of details sketched upon the blackboard. At the close of the paper, which had been closely followed by an audience of over seventy members and friends, a hearty vote of thanks was, on the motion of Mr. Naden (president), seconded by Mr. Doubleday (vice-president), accorded to Mr. Gotch.

\* All information about this Association may be obtained from the Secretary, Miss Dymes Albert Hall.

## THE LONDON COUNTY COUNCIL.

At the supplementary meeting of this Council held on the 11th inst., the earlier portion of the sitting was occupied with the discussion of the question of the control of the police, but there were a few items that came within our province to chronicle.

*Compensation for Land taken for Public Improvements.*—Mr. Costelloe moved:—

"That a Legal Committee be appointed. That it be referred to that committee to consider the existing system of compensation for lands taken for public purposes in the County of London, and to report what steps can be taken to reduce the compensation obtained by owners of land to a point which shall be equitable in the interests of the community."

That the committee shall include those members of the Council who are solicitors or barristers, and such others, if any, as may be recommended by the Standing Committee."

After some discussion, it was resolved to refer the motion to the Improvements Committee for consideration and report.

*The Sale of Land.*—Mr. Saunders moved:—

"That land which shall come into the possession of the London County Council shall not be sold or let on fixed leases; but it may be let on perpetual leases at rents subject to periodic valuation."

He said the condition under which land had hitherto been disposed of had been two—absolute sales, and leases. The great difference in price of leasehold land and land which realised full value might be illustrated by a case respecting land at Kensington, where twenty-five years ago land which was disposed of at a rental of 5s. per foot was now worth 30s. per foot, or more than seven times as much as it then realised. If they could devise a proper system by which they could let land with a profit, they might then be able to minimise the loss they sustained in carrying out public improvements. What the Council lost in selling land under these conditions the builders gained, and consequently it was believed the public obtained the advantage of it, which was a fallacious belief.

The discussion was continued by Mr. Beachcroft (who was opposed to the motion), Mr. Antroub (who moved an amendment, "That the manner of dealing with land which came into the possession of the County Council be referred to the Corporate and Properties Committee for consideration and report"), Mr. Rhodes (who seconded the amendment), Mr. Johnson, Mr. Jackson, Mr. Clarke, Mr. Lloyd, Lord Hobhouse, Mr. Lawson, M.P., Rev. F. Williams, and Mr. Tims. The matter was ultimately referred to a committee.

*Overhead Wires.*—Mr. Beachcroft moved:—

"That as overhead wires, which are daily on the increase in the Metropolis, are under no control whatever, the local authorities having no legal power to interfere unless acts of obstruction or danger are proved, and as no means exist of identifying or dealing with careless wires, it is expedient that all overhead wires should be brought under legislation; that this Council should be constituted the authority for making by-laws for the registration, regulation, and inspection of all such wires; and that it be accordingly referred to the Highways and Parliamentary Committees to confer and report as to the steps to be taken with this object."

This was agreed to.

*Proposed Vestry Hall, St. Martin-in-the-Fields.*

At the meeting of the Council held on Tuesday afternoon last, the Finance Committee reported that they had considered the application of the Vestry of St. Martin-in-the-Fields for a loan of 25,000*l.* for the purpose of erecting a Vestry Hall and offices. To enable the Council to realise the value of this matter, it was thought desirable to set out somewhat in detail the proceedings before the Metropolitan Board in reference to the subject. On June 15, 1888, an application was submitted to that Board from the Vestry for an advance of 40,000*l.* to purchase, partly from the Board and partly from the Marquis of Salisbury, a site between St. Martin's-lane and Charing-cross-road. On July 6, 1888, sketch plans showing for the information of the Board the mode in which it was proposed to deal with the land proposed to be purchased were submitted, from which it appeared that in order to acquire a suitable site for the erection of new offices, the Vestry would have to purchase more land than that actually required for their buildings, and that in order to make provision for the offices and for the carrying out of a much-desired improvement by setting back the premises Nos. 113, 114, and 115, St. Martin's-lane, towards the cost of which the Metropolitan Board had agreed to contribute 1,500*l.*, one-half the value of the land to be added to the public way, there would also be some land to sell which was estimated would produce a recoupment of 8,000*l.* The Board, on July 20, 1888, agreed to advance the 40,000*l.* required, 25,000*l.* being repayable in fifty-two years, and 11,000*l.* out of the recoupments or the Board's contribution, and, failing these recoupments, in five years. The purchase of the land having been completed, the Vestry, on February 8, 1889, applied for sanction to borrow, and also for the advance of 25,000*l.*, the estimated cost of the erection of their proposed new offices. On March 12, the matter was considered by the Finance Committee of the Metropolitan Board, when a report by the Board's Architect on the subject was considered. This report

stated that the buildings would be erected on the freehold property of the Vestry, would occupy an important position at the southern entrance to Charing-cross-road, next the Savings Bank, and had been designed, with a view to suit the requirements of such a prominent site, in the Italian Classic style, the design being a management, such as was usual for the accommodation of a Vestry and their officers, and consisted of the following offices:—On the basement, two housekeepers' rooms, Surveyors' and general stores, two strong rooms, hot-water apparatus, and coal-store. On the ground floor, Surveyor's and Vestry Clerk's public and private offices, Works Committee-room, 28 ft. 6 in. by 38 ft., paper room, sanitary inspector's, medical officer's and analyst rooms, with lavatories. On the first floor, general committee-room, 28 ft. by 44 ft., rate collector's office, Vestry Hall, 40 ft. by 77 ft., lavatories, &c. On the second floor, public and reporters' galleries, and two rooms for the housekeeper. The front was to be built of Portland stone, and the entire cost was estimated at 26,352*l.*, towards which the Vestry asked to borrow 25,000*l.* It was pointed out that the present offices were totally inadequate to the requirements of the Vestry, and did not belong to them. The Metropolitan Board, with a perfect knowledge of these facts, agreed (on the recommendation of their Finance Committee) on May 15, 1889, to advance the 25,000*l.* at 3*1*/<sub>2</sub> per cent., repayable by equal annual instalments in thirty years, and the Solicitor was instructed to complete the loan, and a cheque for the amount would have been drawn on March 22, and this was one of several loans waiting completion when the Board was dissolved. The Board were informed that the late Board were advised that the Vestries of the Metropolis had power to borrow money to provide such offices as were reasonably necessary for transacting their business, and the Metropolitan Board did sanction the raising of loans, and make advances for the erection of offices, in several instances. The present was the first occasion on which the Council had been asked for any loan for offices, and the Committee considered that any such loan should be carefully restricted to the amount required for defraying the cost of such buildings as were actually required by the Vestry for those purposes, with reasonable accommodation for the ratepayers and public attending the meetings. The Committee considered that the accommodation on this basis is exceeded by the present plans, it being stated that the population was below 20,000, and the rateable value under 500,000*l.*, and under these circumstances they recommended:—

"That the application of the Vestry of St. Martin-in-the-Fields for sanction to borrow the sum of 25,000*l.* towards erecting the cost of erecting their proposed new Vestry Hall and offices, be not granted."

Captain Probyn moved, as an amendment to the Committee's recommendation:—

"That the application of the Vestry be granted upon the terms and conditions usual in such cases, and that the matter be referred back to the Finance Committee with instructions to complete."

He was, he said, extremely surprised at the Committee's recommendation, and he thought they were not treating the Vestry of St. Martin-in-the-Fields fairly. One of the most urgent reasons for asking for immediate completion was the fact that the money already borrowed from the Metropolitan Board of Works was costing the Vestry a very large amount. Captain Probyn explained that the whole of the land which had been acquired would not be used for the Vestry Hall, but partly for the site of the new Free Library, which would be built at the same time as the Vestry Hall.

Mr. Augustus Harris seconded the amendment, and after further discussion, the Council divided, and there voted:—For the amendment, 62; against, 42. Majority for the amendment, 20.

The Chairman (Lord Rosebery), in announcing the result, said he thought it would be rash on the part of the Council to embark on this expenditure without taking opinion as to their legal competency to do so, and it was left to the Committee to take adequate legal advice before giving effect to the vote of the Council.

*Bribery (Public Bodies) Prevention Bill.*—The Parliamentary Committee reported that the Bribery (Public Bodies) Prevention Bill is for the more effectual prevention and punishment of bribery and corruption of and by members, officers, or servants of corporations, councils, boards, commissions, or other public bodies. The Committee recommended that a petition be presented in favour of the Bill. This was agreed to.

*Leasehold Enfranchisement.*—The same Committee reported that the Leasehold Enfranchisement Bill is promoted to carry out the recommendation of the Royal Commission on the Housing of the Working Classes in their Supplementary Report, viz., "That legislation favourable to the acquisition, on equitable terms, of the freehold interest on the part of the leaseholder would conduce greatly to the improvement of the dwellings of the people of this country," on the ground "that the prevailing system of building leases is conducive to bad building, to deterioration of property towards the close of the lease, and to a want of interest on the part of the occupier in the house he inhabits," and that "the system of building on leasehold land



a great cause of the many evils connected with the present system of temporary buildings, and excessive rents." The Bill affected all leases having a term of twenty years unexpired, as well as all leases for lives. Sub-leases were treated as leases for the purpose of enfranchisement. The Committee thought that the principle of the Bill should be supported by the Council, and they recommended that a petition be presented in favour of the Leasehold Enfranchisement Bill. After a debate this was agreed to, on a division, by seventy-two votes against thirty, being a majority of forty-two in favour of the Committee's recommendation.

**The Proposed Blackwall Tunnel.**—The Bridges Committee reported that they had had under consideration the subject of the formation of the proposed foot-tunnel at Blackwall, for which a tender amounting to \$18,840, was accepted by the late Metropolitan Board; and had also considered as to the construction of the two tunnels for vehicular traffic, which, together with the foot-tunnel, were estimated to cost about 1,500,000. The Committee have also had submitted to them a scheme for a single tunnel of sufficient dimensions to accommodate two lines of vehicles and foot-passengers, and an estimate of the cost, amounting to about 1,200,000. The Committee thought it desirable that the Council should have an independent opinion upon the relative merits of these two schemes. They therefore recommended—

"That the reports, plans, specifications and estimates of the three tunnels authorized by the Thames Tunnel (Blackwall) Act, 1887, together with the scheme for a single tunnel to accommodate two lines of vehicles and foot-passengers, be referred to an eminent engineer for examination and report."

After some discussion this was agreed to, although in an attempt was made to shelve the question, a ferry being proposed as a possible alternative to the tunnel.

**Ferry Building.**—On the motion of Col. Edis, it was resolved:—

"That it be an instruction to the Building Act Committee to enquire as to what (if any) additional powers are necessary to prevent the present system of ferry building in the Metropolitan area, and the use of improper and unsound materials and construction."

The Council adjourned until the 30th inst.

#### WOLLATON HALL.

SIR,—In Mr. Allen's paper on Wollaton Hall in your last issue) occurs a slight but interesting error in the inscription over the garden entrance. The monogram P.B. there given and explained as referring to Sir Percival and Bridget's wife is, I believe, not a monogram at all, but a letter Q. The inscription is not as clear as when first cut, but when I was deciphering it five years ago I made out that letter to be Q, not for QVE, for the following reasons:—The inscription is in three separate lines, the first of which are hexameters; the third line does not begin immediately under the others, it is in the middle of the space they occupy, as:—

HA FRANCISCI WILLYGHEBI MILITIS EDIS  
RA ARTE EXTRUCTA WILLYGHEBENSIS RELICTAS  
INCOSATE 1580 ET FINITE 1688.

If the letter in question is a monogram P.B. the metre is spoilt, the hexameter would disappear, and the question would arise, why build the inscription have been cast in such flow-ly language and form, when ordinary prose would have sufficed? The point could be settled by a close inspection; but Wollaton is so far away to make a journey there on purpose. Two other points I should like to mention. The roof is said to have been added by Wyatt, it is difficult to believe this, for the work looks genuine Elizabethan. Then, in discussing a question whether the central portion was part of the original design, Mr. Allen makes no reference to the best evidence there is, namely, in Thorpe's drawings, which show it unmistakably.

However, Sir, our cordial thanks are due to Mr. Allen for his careful and elaborate drawings of a very remarkable building; and to you also publishing them so completely.

J. ALFRED GOTCH.

Kettering, April 16, 1889.

\* The precise form of the supposed monogram we could not easily represent in type. We took that Mr. Gotch, like Mr. Allen, gives "P.B." in the last line of the inscription. There is no such word in Latin we regarded a mistake in transcribing, and gave the proper form, "P.B."; but as both correspondents represent the other reading we give the mistake is in the original inscription.

#### ST. PAUL'S A WALHALLA.

SIR,—When the great John Hunter attended the public funeral of Sir Joshua Reynolds in St. Paul's Cathedral, he said to the gentleman in the same coach with him, "Had I been Sir Joshua, I would have presented the church of St. Paul's with a picture of the conversion of that Saint, to place over the altar." Probably Hunter did not know that Reynolds had really anticipated his suggestion, and fully intended to have presented to the Chapter a picture of the Holy Family that he had painted, but that Dr. Terrick, then Bishop of London, had entirely put a stop to the plan for decorating the Cathedral by the paintings of the most eminent English artists. West, Barry, and a number of others were ready to have seconded Reynolds in the design. Dean Milman, in his annals of St. Paul's, seems to think it very lucky that the offer fell through as it did. Much is to be said in favour of the Dean's view. Reynolds was a good colourist and a fine portrait-painter, but we may rest quite assured that any attempt at historical painting made by him would only have lessened his reputation and injured the edifice. The master of West and Angelico, Karaman, and the rough savagery of Barry, would have been simply insufferable and ridiculous. It may be questioned whether, if we had a Correggio to do for us such frescoes as he did in the monastery of St. Paolo at Piacenza, with a Juno suspended in the clouds after Homer, Diana in her car, and all manner of allegorical riddles accompanying, painted like life so as to stand out away from the wall, the performance would be a thing to be desired. The interior of the Cathedral, however, is certainly not as Wren intended it should be. He had at least planned to introduce mosaics in the best Italian manner, that it might look a little less cold and frigid than Nova Zembla. Colour is absolutely indispensable in the interior. What has been done in the Salvati process, serves only to show that no more should be done in that way. The colours are not effective, the figures are not finely conceived, and they are so much larger than life as to diminish the apparent size of the dome to one-half its real dimension. One would think it difficult to effect three such distinct misarrangements at one stroke. But it is probable that the Reynolds' clique would have done worse on every count. So that Terrick, in what has been called his narrow bigotry, really saved the church from a calamity. Would it not be well to have recourse to the Moorish system of colour and decoration, altogether eschewing pictorial composition and the human figure, and substituting elegant devices with the sole view of introducing colour effectively? This, with efficient knowledge, might be arrived at for a comparatively very small cost. And it should be remembered that in a climate like ours, colour is transitory.\* A pattern is, consequently, preferable to a picture, as it can readily be renewed from time to time by a hand inferior to that of the original designer. A picture, on the contrary, begins to deteriorate from the day that it is completed, and when the design of Michael Angelo fades from the Sistine Chapel, where is the genius that can effect the restoration? Not so with a pattern. It can be continually reproduced until such time as higher knowledge of interior decoration and a more skilful juxtaposition of colour shall enable us to replace it with a still nobler design. In this respect we may even rejoice that the absorption of funds in the reredos renders it impossible to adopt at present any pictorial system of colouration for the interior of St. Paul's. But something should now be done, and that immediately, to introduce a little warmth into a building that for 150 years has been left to look as blank and cold as a catacomb.

The reason why it is so much to be wished that this should be done quickly is that if the church were rendered agreeable to the general eyesight, the Cathedral would become what it should have long since have been growing into,—the British Temple of Fame, to the relief of the *campus sancto* at Westminster. If we could spare the Abbey from the proposed eyecore of a new mortuary chapel, out of keeping with the locality, and quite inefficient for its purpose, a really grand point would be gained. Every sensible man would think it a greater honour to be interred in Wren's mighty dome than in a new undertaker's office, erected by the State Cemetery Company,—a place that must be as bare of sentiment as a Surrey-side Dissenting Chapel, even if we could make it beautiful to the eye. The glorious seclusion of old Post's Corner, with its busts on pedestals and brackets, like a modeller's fine-art gallery, has itself been terribly desecrated of late years. Its beauty once was that death had hallowed it silently, and as it were, by accident, like gravitation to like and great to great. But now that the vulgar have all begun to push for it, there is danger that your crude Pantheon will disgust men of sense, and they will refuse to be buried there with old Sir Godfrey Kneller, who objected to the place because "they do bury fools there."

Above all things, it is to be hoped that, whether we commemorate in future at Westminster or St. Paul's, we shall not allow the empty farce to be perpetrated of setting up memorial tablets and cenotaphs to those whose bodies lie hundreds of miles away. If the body cannot be brought to the spot, and reverently interred, let us be spared the folly in future of setting up inscribed stones to names that have no connexion with the place. Robert Burns, for instance, has just been added to the museum of mortuary curios in Westminster. What can be in worse taste than this? It will scarcely be respectable to die if this practice is continued. St. Paul's itself, unfortunately, is full of bad and inappropriate statuary,—an utterly nude Ponsoby, a semi-nude Johnson, are amongst things that should, if possible, be removed; and the absurdity of Stevens's Wellington, that blocks up the whole of a little side chapel, and cannot be seen from any point of view,\* makes you laugh at the present taste as you blush for that of the past. But all the foregoing is no reason why Wren's noble work should any longer lie neglected. Clothe it suitably in colour, and men will perhaps be proud of the award of burial there. Already a good many are gathered into it, "Quisquis memores alios fecere merendo," whose great desert has brought them memory. Any man, were he a Newton or a Milton, might be proud to be laid next to Wren, and if the public can be led to think this, we shall be furnished, at a merely nominal cost, with a noble mausoleum, and may preserve inviolate the sacred precincts of our Abbey.

Walthamstow.

C. A. WARD.

#### THE BRACKET IN EYNSFORD CHURCH.

SIR,—Mr. Johnston's sketch in last week's *Builder*, of the bracket in Eynsford Church, to which I have recently drawn attention, gives an excellent idea of its appearance and position. I cannot, however, see that it at all follows, as a matter of course, that because there is reason to suppose that the contiguous stones are not of the same date as the bracket, it must be therefore concluded that the bracket was designed for another position than it now occupies. The theory, too, that it at one time formed "a portion of the abacus of a Norman arch" appears to me very improbable, for, putting aside the important fact of the worn hole, the ornament and chamber is carried round all three sides of the projection, which is only a few inches across all ways.

In support of my suggestion that the use of the bracket was connected with the Leuten veil, I should like to add that the bracket is just at that height which we may suppose the veil to have reached in order to hide the altar with its furniture; and that we know that cords were in use to draw the veil: "Item, in cordes to draw the cloths before the high altar in Lent" (Churchwardens' Accounts, Camden Society, p. 12).

Another explanation for the presence of the bracket may be found by comparing it with another at Tewkesbury Abbey. This, like that at Eynsford, projects from the wall of the chancel, and is situated between the choir and high altar, but is in the north wall, and at a greater height from the floor than that at Eynsford. It is perforated with a small hole, and upon it rests a fenestral wooden case, which at one time contained the sacring bell, the cord from which hung down through the hole in the bracket. Perhaps our bracket may at one time have had such a case upon it, which served for a like purpose. A suspended sacring bell still hangs in the chancel at Searing, Norfolk, and at Hawstead, in Suffolk, both being quite distinct from the sanctus bell outside the church.

To one or the other of these suggestions, we may, I think, very reasonably assign the origin of our bracket, which is certainly a very unusual feature and one of great interest.

HENRY LITTLEHALES.

Clovelly, Bexley Heath.

#### FIREPROOF FLOORS.

SIR,—Referring to a letter from Mr. Mark Fawcett in your last issue, I beg to state that Mr. Fawcett's remarks at the discussion following my paper will be fully dealt with in my reply, and I must decline to enter into a newspaper controversy on the subject, but will content myself with saying that Mr. Fawcett's statements regarding the tests of the different bricks are incorrect and incomplete, inasmuch as he omits to state that his bricks are 2½ times the size of Mr. Lindsay's, and further, both bricks were tested in precisely the same way.

G. M. LAWFORD.

Westminster, April 16, 1889.

#### THE SOCIETY OF ENGINEERS.

SIR,—Referring to the foot-note on page 284 of your issue of the 13th inst., having reference to meetings of the Society of Engineers, I think it right to point out that it must have been written under an entire misapprehension, as the Press are always welcomed to the meetings of the Society.

\* The monument was not designed by Stevens for that position.—Ed.

\* Not in mosaic.—Ed.



and a notice of each meeting is sent to the Editors of all the chief technical journals. Moreover, Press reporters who attend the meetings are not precluded from taking notes of the discussion for publication in their journals.

G. H. PRYOR CUXSON,  
Secretary Society of Engineers.

Westminster, April 15, 1889.

#### HOLY TRINITY CHURCH, SOUTH SHORE, BLACKPOOL.

SIR,—With reference to an illustration which appeared in your issue of April 6 last, purporting to be a view of Holy Trinity Church, South Shore, will you be good enough to permit me to state on behalf of the Building Committee of that church that, so far as regards the reredos, ornaments, and fittings of the Lord's Table shown therein, it is incorrect; being with respect to them an entirely fancy sketch, and that no such plan of reredos, &c., has been laid before us, or is likely to be accepted by us.

S. Y. B. BRADSHAW, VICAR:  
Chairman Building Committee, South Shore Church.

Blackpool, April 16, 1889.

### The Student's Column.

#### TOWN DRAINAGE.

##### XVI.—HOUSE DRAINS TO HAVE REGULAR INCLINATIONS.

ON the occasion of examining the premises of houses before a sewer is laid, to ascertain and to mark the places of the junctions, it will be found in many cases unnecessary to lay the drain under a house, and that two or more, up to, say, six houses, may have one drain only, as shown in the accompanying fig. 1, or as in fig. 2, especially when the four or six belong to one owner. One drain is sufficient for any such number of houses, and, indeed, is better than two or more if the combined area of the back premises is not so great as to collect more rain-water than one pipe can carry off when the depth of rainfall amounts to, say, 1.2 in. in half an hour, the drain-pipe being not more than two-thirds full; and, with regard to this area, it is as follows under the circumstances named. A 6-in. pipe running two-thirds full, with an inclination of 1 in 60, carries off this heavy rainfall from an area of 1,000 square yards; with an inclination of 1 in 30 it carries it off from 1,400 square yards. A 4-in. pipe running two-thirds full carries off the same intensity of rainfall from 400 square yards at 1 in 60, and from 560 square yards at 1 in 30. These are the practical quantities, when the drain is laid with water-tight joints and regular inclinations from end to end of each straight length. The difference of level of the ground at the two ends of the main portion of the drain should be ascertained before the rate of inclination is decided upon, so that at the far end of this main portion the level of the drain may be low enough to enable all branches beyond it to be brought into it with sufficient fall.

Having determined upon the rate of inclination the easiest way to ensure a regular gradient is, where the length is considerable,—to fix two sight-rails across the trench, one at the extreme lower end and one at the upper end, the line of the drain being perfectly straight between the two points. The lower sight-rail having been fixed at a convenient height above the surface of the ground, the upper one is fixed at a level as much above the lower one,—with the proper levelling instrument,—as the rate of inclination and the distance require, so that the line of sight along the tops of the two sight-rails has the same inclination as the drain is intended to have. A rod, then, with a cross-head, being cut to the length which is equal to the difference of level between the bottom of the trench and the tops of the sight-rails, and set up at every point between them, determines everywhere the exact depth of the trench, no measuring downwards from the surface being anywhere required. The sight-rails may be fixed by setting up on the ground two of the drain-pipes, one on each side of the trench, and far enough away from it to remain undisturbed, and setting up in each a piece of quartering 6 or 7 ft. long, and filling the pipes with earth. The sight-rail, 3 in. by 1 in., planed, and the edges shot straight, can then be placed across the uprights and held to them by staples. For short lengths the bottom of the trench may be formed to the required gradient by setting a

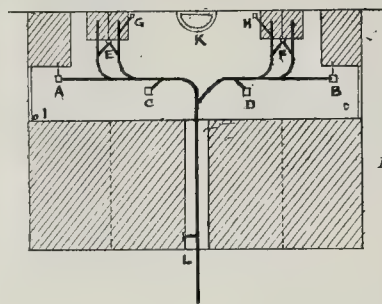


Fig. 1.

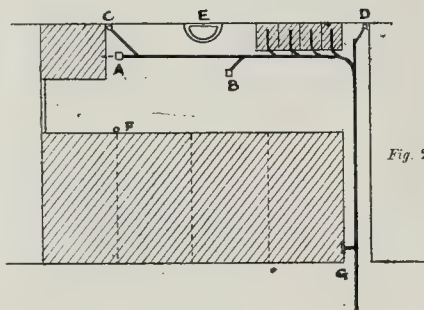


Fig. 2.

hand-level upon a straight-edge not less than 10 ft. long, and which is as much deeper at one end than the other as the inclination of the drain is in the length of the straight-edge, a dab of red paint being put upon one of the two ends to prevent their being mistaken where the difference is but slight.

True gradients are not so much required for carrying off the large quantities of rain-water as the ordinary run of sewage, of an inch or two in depth. It is this, during long periods of dry weather, which makes it so necessary to take the trouble, when laying a drain, to make the inclination of each length regular from end to end, so that the ordinary run of sewage may keep the drain free from deposit. The quantity of sewage delivered into house-drains is that of the water-supply only, and for town drainage we must assume a full average supply from the public waterworks drawn from the pipes through taps on the premises, and not procured from wells, but even with this full supply it is advantageous to the drain to have more than one house connected with it.

In the first of the accompanying figures the gullies A and B receive the waste water from the two washhouses belonging to the four houses, and serve also for the house-slopes of the two end houses, and the gullies C and D are for the use of the two middle houses. The four water-closets are drained by the four branches shown. There are two ventilating-pipes, of equal height, E and F, carried up against the water-closet wall, there being a pipe to each of them from each branch. Small gully-traps in the urinal corners G and H are connected with the two branch drains shown. The asphalt K serves for the four houses.

In the second figure the gully A receives the waste water from the washhouse common to the four houses, and serves also for the house-slopes of the two farthest houses; B for the other two. The four water-closets are placed together. The ventilating-pipe is at G; the urinal corner at D; the asphalt at E. The rain-water of the back slopes of the roofs of the four houses descends at the corner I, and runs by a surface-channel into the gully A, requiring, therefore, no trap, and being unconnected with the drain. In the second figure it is at F, and runs into the gully A.

In the case of the first figure, the air-inlet to the drain is at L, in the passage wall; in the other case it is at C, also in the house wall, unless in either case permission be given to place it in the face of the curbstone—if it be a suitable one. Mr. Cregeen's air inlet, of which a section was given in a foot-note of article XIII., may be adopted in lieu of these vertical inlets, or either of them, where attention can be ensured

to remove the dirt periodically. This can be done when it is under the recognised control of the sanitary authority of the town, in which case instructions are given to an appointed workman to remove the accumulations along with those of the street gullies at stated intervals of time; but some appointment of this sort is necessary, otherwise, if the emptying of the dirt-boxes be left to the tenants, it becomes one of those cases in which the business of all is that of none in particular. But with the attention we have named, it is a better form of air-inlet than the vertical one; and there are cases in which one of the tenants of a small number of houses is appointed by the owner or his agent to have charge of the drainage, so far as the proper working depends upon the tenants' use of it; and in such cases there is no difficulty in the matter just mentioned.

**Proposed Testimonial to Sir Charles Newton.**—We are pleased to see that a movement has been started for the purpose of recognising the services of Sir C. T. Newton to classical archaeology, and many eminent names have already been received in support of the scheme. It is felt that his discoveries at Halicarnassus, his work at the British Museum, his lectures from the Chair of Archaeology at University College, and his various writings, have done much to sustain the reputation of England in this particular province of research, and that his services merit some kind of public recognition. At a meeting held at 43, Portman-square, on Wednesday, March 20, the Earl of Carnarvon in the chair, the following resolution was passed unanimously:—"That subscriptions be invited for a bust of Sir Charles Newton as a recognition of his eminent services to classical archaeology, and that the Trustees of the British Museum be requested to allow such bust to be placed in the Museum." At the same time a committee (with power to add to their number) was appointed to carry out the resolution, and Mr. George Macmillan was appointed secretary and treasurer to the fund. At a later meeting, on March 27, the committee decided to expend a portion of the subscriptions on the execution of a bust by Mr. Boehm as a personal memorial of Sir Charles Newton; but they confidently hoped that a sufficient sum may be raised to enable them also to commemorate Sir Charles Newton's life-work by the establishment of some prize or studentship for the encouragement of research in Hellenic archaeology in connexion with the British School at Athens, and this, it is now known, is the wish of Sir Charles himself. Mr. George Macmillan, 29, Bedford-street, Covent Garden, will acknowledge subscriptions.



RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

6,422, Inscriptions and Decorations in Stone. W. Freebury.

According to this invention, the stone or marble first coated with size or isinglass, to prevent discoloration, in the case of light-tinted stone or marble, the design or inscription is then written, traced, engraved, transferred, or printed on the stone or marble with grease that will resist the action of acid, which is then applied to it. The decoration or inscription may be either in relief or sunk, and may be filled in with lead or any composition to give a contrast, so as to show the design or inscription. The new method is especially suitable for signs, tablets, or tombstones.

7,132, Fresh-air Inlet, for Ventilating Drains. H. Lock.

The apparatus which is the subject of this invention consists in a chamber communicating with the sewer, land surmounted by a perforated cap, valve, which governs the communication with the sewer and with the atmosphere, air is pivoted in the chamber. This valve is so balanced on its supports that it normally lies open, admitting fresh air into the sewer. On the occurrence, however, of back draught proceeding from the sewer, the valve is raised under its influence, and, closing the communication with the sewer, prevents the escape by the inlet of foul air or gas. A deflecting plate is added to ensure certainty of action.

17,752, Floor Ventilator. W. Millar.

The floor ventilator which is the subject of this invention is a tube for ventilating boarded floors, where the outside ground or pavement is level with, or above the level of, the boarded floor of a room, or outer end of the ventilator or tube is fitted with a movable grate, which is dropped in through slot on the top of the tube. The bottom of the grate fits into a groove formed on the inside of the outer side of the tube. The inner end of the ventilator or tube is open, and terminates in line with the inner surface of the wall between the floors. The ventilator or tube is to be built in the wall, and is made of any metal, and of dimensions as suit conditions.

2,049, Machines for Cutting Stone. H. Young.

A long specification describes elaborate and ingenious machinery for cutting stone into forms, having flat, polygonal, or curved surfaces. The stones are dressed and interchangeable, and have with intermittent and distinct motion. A large geometric range and combinations is obtained with the smallest number of parts.

2,422, Sample-case for Paper-hangings. C. A. Tre.

By this invention a case is devised in which the imple of similar pattern, but different colours or tints, is placed on one side with printed matter explaining the effect of the separate colours; and on the other side of the opening, a design of the pattern, but with darts and fringes, shows how the paper will look in the room when hung.

2,547, Chimney-cowls. E. A. Lisle.

According to this invention, a revolving cowl is fitted that it moves freely, but in such way that sides are always at right angles to the direction of the wind. Three vanes are fixed equidistant on the top side of cowl, the central being the largest, being the one by which the cowl is turned, the two side-vanes steadying the action.

NEW APPLICATIONS FOR PATENTS.

April 1.—5,518, W. Place and J. Coulthurst, Chimney and other socket-pipes.

April 2.—5,595, R. Roberts, Prevention of Down-draught in Chimney-pots. 5,544, T. Shouler, Ropes or Fasteners for Cupboard Door, &c.—5,545, Francart, Construction of Arches.

April 4.—5,748, J. Willing, Fixing Letters and notices to Facias, &c.—5,756, J. Macnaughton, and vices to Facias, &c.—5,775, J. Denny, Joining Bricks, Tiles, &c.—5,790, E. Emden, Draining Joints. 7,792, L. Andes, Disinfecting Paint.

—5,826, R. Robinson, Joint for Sanitary Pipes. —5,836, J. Shanks, Flushing Apparatus of Water-closets.—5,846, J. Watkinson and T. Dodd, Brackets, Chandeliers, &c.—5,875, A. Clark, Ink-detector for Pipes.

April 6.—5,910, H. Page, Sash-locks, &c.—5,919, Lea and H. Lyman, Fastenings for Rain-water, &c.—5,942, J. Oldroyd, Window-fasteners.

PROVISIONAL SPECIFICATIONS ACCEPTED.

6,632, D. Jones, Fireproof Curtains for Theatres, &c.—3,143, W. Jones, Branding Timber, &c.—3,143, J. Swallow and J. Jackson, Bricks, Tiles, &c.—3,130, J. Young, Window Frames and Sashes.—3,135, W. Davidson, Fastenings for Rain-water, &c.—4,147, F. Harbridge and E. Well, Combination Carpenter's Square. 4,285, Marsden, Ornamental Bricks, Tiles, &c.—4,347, Homan, Fireproof Structures, and Bricks for use.—4,392, T. Cooper, Fireproof Floor or Roof structure.—4,432, W. Ingie, Hanging Sliding Sashes.—4,434, A. del Guerra and D. Fano, Door-fasteners.—4,463, R. Little, Mortis-

ing Chisel.—4,485, J. Burnett, Alarm Apparatus for Doors and Windows.—5,055, T. Buchanan, Chisels for Flushing Water-closets, &c.—5,139, A. Ragg, Carpenter's Planes.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

1,056, C. Brown, Safety Appliances for use in Repairing Windows, &c.—3,443, R. Rendall, Decorating Glass Panels, &c.—3,466, Goldschmidt and Michaelis, Water-closets.—3,893, W. Johnson, Machinery for Pressing Sand-faced Bricks.—3,925, R. Capstick and H. Pinchon, Self-locking Sash-fastener.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 8.—By G. F. FLOWER.

City—1, 2, and 3, Newberry-st., and 12, Kinghorn-st., f. r. £33 p.a. £2,010  
2454, 116, u. t. 29 yrs. £2,280  
Tottenham-court-road—37, Whitfield-st., and 113, Charlotte-news, c. r. £250 p.a.

By DAVIES & CO.  
Regent-street—i. g. r. of £745 ss. let at £1,300, g. r. £454, 116, u. t. 29 yrs. £9,600  
Harrow-on-the-Hill—"Roxa House," and 12a, 2c, 12p, c. r. £250 p.a. £4,550  
Portman-square—21, Orchard-st., i. g. r. of £70, let at £80, u. t. 19 yrs. £900  
Kensington Town—i. g. r. of £45, let at £43, g. r. £5, u. t. 72 yrs. £780

By A. & A. FIELD.  
Mile-end—3, Antill-ter, u. t. 33 yrs, g. r. £3, in hand £250 p.a. £310  
Commercial-road, E.—10 and 12, West Arbour-st., u. t. 39 yrs, g. r. £68, r. £45 p.a. £450  
3, Emouth st., and a g. r. of £8, u. t. 4 yrs, no g. r. £28, 12a, 2c, 12p, c. r. £250 p.a. £45  
Bow—5, Avenue-ter, u. t. 43 yrs, g. r. £4, 46, r. £26 p.a. £280  
Whitechapel—Turner-st., u. t. 18 yrs, g. r. £2, 56, r. £31 p.a. £145  
Commercial-road, E.—13, Coke-st., f. r. £22 p.a. £325

By WOODS & SWELLING.  
Mile-end—140 and 142, Grafton-st., u. t. 39 yrs, g. r. £3, 10s, r. £2 p.a. £610

By WALTON & WILKINS.  
Norwood—The residence called "Springbank," u. t. 68 yrs, g. r. £6, 8s, 6d, with possession £400  
Wandsworth—i. g. r. of £12, reversion in 93 yrs, to c. r. £52 p.a. £284  
f. g. r. of £18, reversion in 94 yrs, to c. r. £78 p.a. £394  
Hackney Wick—i. g. r. of £12, u. t. 69 yrs £115

By FOWLER & PEMBERTON.  
Kensington—6 to 12 (even), Sinclair-gdns, f. r. £285 p.a. £7,740  
17, 19, 21, and 29, Sinclair-gdns, f. r. £290 p.a. £6,575  
2 to 24, Wharton-st., f. r. £408 p.a. £5,880  
47 and 45, Earl's Court-sq., u. t. 84 yrs, g. r. £88, r. £228 p.a. £2,000  
29 and 31, Earl's Court-sq., unfinished houses, g. r. £33, 10s. £370

April 10.—By R. TIDY & SON.  
Dalston—10 and 11, Clifton Grove, u. t. 62 yrs, g. r. £10, r. £66 p.a. £550  
Stoke Newington—40, Mayville st., u. t. 70 yrs, g. r. £5, c. r. £35 £105

By OGILL, SWANN, & OGILL.  
Chelsea—383, King's-rd., u. t. 8 yrs, g. r. £20, and a g. r. of £8, 7s, 6d, same term, at a g. r. of £12, 11s, 2d. £100  
4, St. Andrew-st., u. t. 3 yrs, g. r. £5, r. £31 p.a. £110  
Camberwell—30 and 32, Denmark-hill, f. r. £70 p.a. £1,180  
1 to 12, Tiger Cottages, and 2, Tiger-yd., f. r. £158 p.a. £800  
19, Camberwell-green, and The Tiger Wine Vaults, f. r. £250 p.a. £4,500

By FARRBROTHER, ELLIS, & CO.  
Whitechapel-road—No. 212, f. r. £129 p.a. £1,700  
210, Whitechapel-rd., f. r. £80 p.a. £1,250  
129, 131, and 133, N. York-st., f. r. £15 p.a. £2,080  
City of London—31 and 33, Cook-lane, u. t. 73 yrs, g. r. £17, 10s, r. £150 p.a. £2,750  
12, Worship-st., u. t. 30 yrs, g. r. £50, r. £20 p.a. £1,800  
45, Tabernacle-st., u. t. 51 yrs, g. r. £24, r. £110 p.a. £1,100  
51, Tabernacle-st., u. t. 65 yrs, g. r. £40, r. £152 p.a. £1,500  
121 and 123, Commercial-rd., u. t. 72 yrs, g. r. £20, r. £180 p.a. £1,850  
Spitalfields—25, Lamb-st., u. t. 72 yrs, g. r. £12, r. £55 p.a. £580  
Chelsea—i. g. r. £16 p.a., u. t. 18 yrs, r. £30 p.a. £165

April 11.—By DAVE & SON.  
Islington—84 and 86, Richmond-rd., u. t. 33 yrs, g. r. £13, r. £54 p.a. £635  
29, Gilmart-st., u. t. 33 yrs, g. r. £2, r. £20 p.a. £210  
Hoxton—4 and 6, Eagle Ward-st., g. r. £3, 12s, c. r. £60 p.a. £170

By H. J. BATES & SONS.  
Bethnal Green—25, 29, and 31, Church-row, f. r. £132, 11s, 2d. £1,500  
Mile End—42, West st. f. r. £23 p.a. £220  
Bethnal Green—54, Roman-rd., u. t. 53 yrs, g. r. £5, c. r. £10 p.a. £310

By MRS. CHADWICK.  
Brompton—152 and 154, Walton-st., f. r. £169, 16s, p.a. £1,750  
148 and 150, Walton-st., f. r. £180, 14s, p.a. £1,750  
O.2 Kenton-st., Foxroxy—A plot of 1/2 land, area 7,500 ft. £100

By C. C. & T. MOORE.  
Whitechapel—S. O. born-st., f. r. £120 p.a. £1,620  
Mile End—35, Nor olk-st., u. t. 35 yrs, g. r. £3, r. £23 p.a. £220  
3, Cordelia-st., u. t. 68 yrs, g. r. £3, 15s, r. £26 p.a. £145  
Caledonian-road—115, Brompton-st., u. t. 65 yrs, g. r. £4, r. £34, 12s, p.a. £210  
Mile End-road—Nos. 204, 206, 208, 210, to 212 (even), u. t. 281 yrs, g. r. 10s, subject to a payment of £15 p.a. for 34 yrs, r. £233 p.a. £3,800

By NEWSON & HARDING.  
Islington—1, Canonbury Park North, u. t. 56 yrs, g. r. £3, r. £80 p.a. £600  
15, Cloudeley-st., u. t. 27 yrs, g. r. £8, c. r. £50 p.a. £325  
34, Canonbury-sq., u. t. 18 yrs, g. r. £14, r. £63 p.a. also i. g. r. £14 p.a. £801  
Upper Clapton—1 and 2, Acadia, u. t. 13 1/2 yrs, g. r. £20, r. £175 p.a. £86  
Holloway—20, Andover-st., f. r. £28 p.a. £360  
Islington—18, Wynford-rd., and 18, Cumming-st., u. t. 35 yrs, g. r. £4, r. £66 p.a. £410  
14 and 16, Wynford-rd., u. t. 35 yrs, g. r. £20, r. £80 p.a. £330

By E. STIMSON.  
Peckham—38 to 46 (even), High-st., u. t. 97 yrs, g. r. £132, 10s, r. £470 p.a. £3,450  
238 to 239, Commercial-rd., u. t. 71 yrs, g. r. £20, r. £124 p.a. £645  
9, Nutt-st., u. t. 74 yrs, g. r. £3, r. £28 p.a. £200  
Clapham-rd.—34 and 36, Wellington-rd., u. t. 66 yrs, g. r. £3, r. £67, 12s, p.a. £385  
Brixton-rd.—No. 244, u. t. 12 1/2 yrs, g. r. £50, r. £100 p.a. £690  
Woodford, Tavitock-road—"Oakleigh," u. t. 95 yrs, g. r. £10, 10s, r. £45 p.a. £300  
Brixton—60, Josephine-avenue, u. t. 78 yrs, g. r. £14, r. £80 p.a. £669  
31, 33, 37 to 47 (odd), Appach-rd., u. t. 76 yrs, g. r. £29, r. £269 p.a. £1,860  
5, 7, 9, and 11, Brailford-rd., u. t. 85 yrs, g. r. £28 £690  
67 to 77 (odd), Brailford-rd., u. t. 85 yrs, g. r. £20 £1,485  
Lambeth—113, Waterloo-rd., f. r. £20 p.a. £450  
Islington—37, Victoria-st., u. t. 4 yrs, g. r. £4, r. £20 p.a. £26

April 12.—By MULLART, BOOKE, & CO.  
71, Church-st., u. t. 33 yrs, g. r. £8, r. £54 p.a. £620  
i. g. r. of £10 p.a., u. t. 32 1/2 yrs. £1,460  
i. g. r. of £10 p.a., u. t. 31 yrs. £636  
i. g. r. of £20 p.a., u. t. 31 yrs. £246  
£280

By E. STIMSON.  
Peckham—7, Burton-ter, u. t. 90 yrs, g. r. £7, 14s, r. £32 p.a. £300  
Thornton-beath—1 and 2, Clarence Villas, u. t. 75 yrs, g. r. £16, r. £32 p.a. £400  
[Contractions used in this list.—E. g. r. for freehold ground-rent; i. g. r. for leasehold ground-rent; f. r. for freehold; c. r. for copyhold; l. for leasehold; e. r. for estimated rental; u. t. for unexpired term; p. a. for per annum; yrs. for years; r. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

SATURDAY, APRIL 20.  
Edinburgh Architectural Association.—Visit to Riccarton House and Gogar House.  
WEDNESDAY, APRIL 24.  
Inventors' Institute.—8 p.m.  
THURSDAY, APRIL 25.  
Institution of Electrical Engineers.—Professor Oliver Lodge, F.R.S., on "Lightning Conductors." 8 p.m.  
Society for the Encouragement of the Fine Arts.—Second Conversazione.

Miscellaneous.

Proposed Picture Gallery in New York.—Mr. Henry G. Marquand, of New York, has presented his valuable collection of paintings by Rembrandt, Velasquez, Van Dyck, Turner, Constable, and others, to the Metropolitan Museum in that city. The works are thirty-five in number, and valued at some 100,000. It is the intention to make the collection the nucleus of a picture gallery in New York similar to those existing in various continental towns.

The Walls of Chester.—"E. W. C." writes to us as follows:—"New excavations have been commenced close to the east wall, which is supposed by some to be Roman work. These disclose the wall to its foundation, and it will be very desirable that this opportunity should not be lost to strive to elucidate in an exact and scientific way such evidences as these works may show, either in the structure or in the soil, of the yet unsolved problems connected with the plan and details of this ancient city."

"Quantity-Surveyors and the London School Board."—Referring to the paragraph with this heading in our last issue (p. 285), we notice that at the last meeting of the Board a letter was received from Mr. T. Thornton Green, referring to the fact that he is not among the six quantity-surveyors selected to take out quantities for the Board in future; stating that, in entering into a special arrangement with the Board ten years ago, he necessarily had to sacrifice most of his private practice; that he has performed the Board's work under exceptional conditions; that he feels that it is due to him that the Board should offer some reasons for placing him in such an unfavourable position; and asking that the matter may be reconsidered, or, at least, that the Board will allow his name to be added to the number selected. The letter was referred to the Works Committee.



**Plaster of Paris Floors.**—A communication has been sent to the French Academy of Sciences by M. Julte, on a new process of hardening plaster of Paris, so as to adapt it for the construction of flooring in place of wood, and to other purposes for which it cannot be applied in its ordinary state on account of its want of hardness and its inability to resist crushing. M. Julte recommends an intimate mixture of six parts of plaster of good quality with one part of finely-sifted, recently slaked lime. This mixture is employed like ordinary plaster. After the floor or other object made from it has become thoroughly dry it is saturated with a solution of any sulphate the base of which is precipitated in an insoluble form by lime, the sulphates best adapted being those of iron or zinc. The hardest surfaces are obtained with sulphate of iron, and in order to assure a maximum of hardness and tenacity it is necessary to temper the limed plaster well in as short a period as possible, and with no more water than is necessary. It is also best to employ the fastest workmen, for it is important that the plaster should not be spread over the surface by passing and re-passing the trowel for too long a time. With sulphate of zinc the flooring remains white, but with sulphate of iron finally assumes the rusty tint peculiar to sesquioxide of iron. If linseed oil boiled with litharge be then applied to the surface, the latter assumes a beautiful mahogany colour, and offers a certain superficial elasticity to the tread. If a coat of hard copal varnish be added, the floor acquires the appearance of an oak floor, with the advantage that its cost is only one-fourth that of oak.

**Cheap Pressed Bricks.**—Mr. R. S. Black sends us particulars of some wonderfully cheap bricks he is producing near Peterborough, at about 7s. 7d. per 1,000 prime cost, not including allowance for wear and tear, rents, taxes, &c. He says:—"These pressed bricks are made from shale, which in this district is called 'knots,' and is found immediately below a bed of plastic clay, and until a few years back these 'knots' were considered worthless for brick-making, because the brickmakers did not understand how to work them. The 'knots' require no previous preparation; they can be in their natural state in the clay-pit, got, loaded into wagons, hauled up by the engine, tipped into the perforated pan, ground, raised by an elevator, fed into the hoppers of the machines, made into bricks, pressed, loaded on barrows, wheeled, and set in the kiln ready for steaming and burning in less than ten minutes. The great secret of all this is that the 'knots' will stand grinding, quick drying, contain a great portion of natural fuel, and take very little coal." As this is the manufacturer's own statement, readers must take it *cum grano*, and as to the value of the bricks thus made "in ten minutes" we have as yet had no opportunity of judging; but the statement as to material seemed of sufficient interest to give, for any of those who think it worth while to look further into it.

**Gift to the City of London Art Gallery.**—During the past few days the Library Committee of the Corporation of London has been presented with seven water-colour drawings by Mr. E. A. Haffer, architect, who some weeks since, when he was in the City, happened to pay a visit to the Gallery. The first picture represents the tomb and chantry of Henry V., in Westminster Abbey; the second, the tomb of Thomas O'Ruathall, Bishop of Durham, in Westminster Abbey; the third, the tombs of Eleanor of Castile, Henry III., and Edward I., in Westminster Abbey; the fourth, the last vestige of the Fleet River; the fifth, the promontorium of Chester Cathedral; the sixth, Gisors Hall; and the seventh, a rock-cut temple in Bombay. The seven pictures will soon be on view, as Mr. Temple, the curator, has already given instructions for the preparation of a screen on which they can be all displayed.

**New Imperial Palace at Tokio.**—The Emperor of Japan has just taken possession of a magnificent new palace built for him at Tokio. The style is a curious mixture of modern European and ancient Japanese architecture, but the interior is wholly arranged in European manner. The architect is a native, and the cost of the building and fittings 800,000. Nearly all the furniture has been manufactured in Germany.

**New Art Museum at Kiel.**—The Provincial Diet of Schleswig-Holstein has voted a sum of 5,000*l.* towards the proposed art museum at Kiel.

**Successful Artesian Boring at Harlington.**—We are told that a very good supply of water has just been found at Harlington, near Hounslow, for her Majesty's Office of Works. A 5-in. boring has been carried down to the depth of 292 ft., and at this depth the chalk was reached, and after boring a further depth of 40 ft. into the chalk the water rose 9 ft. above the surface, and continues to flow at the rate of sixteen gallons per minute. The supply has been tested, and it cannot be lowered more than 10 ft. from the surface, and is equal at this level to 250,000 gallons per day. The work has been carried out by Messrs. W. Brown & Son, artesian well engineers, Tottenham, under the direction of Mr. J. Butler, Engineer to the Office of Works.

**The Rhondda and Swansea Bay Railway.**—We hear that the Tunnel Driving Company, Limited, have now completed, by means of their special appliances, the driving of the 8 ft. heading for a distance of about one mile, commencing at the Treherbert end of the tunnel in the Rhondda Valley. The completion of this boring through the mountain, which is regarded as a noteworthy engineering feat, will enable this important line of railway to be opened for traffic in the course of a few months, when Cardiff coal can be shipped from Swansea with ease and dispatch at moderate rates.

**Indiarubber Paving.**—The Berlin and Hamburg civic authorities have found the recent experiments of paving streets with indiarubber, to which we lately referred, so satisfactory, that in the summer several new thoroughfares and bridges are to be covered with this material.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                      | £. s. d. | £. s. d. |
|------------------------------|----------|----------|
| Greenheart, B.G. .... ton    | 6 10 0   | 7 10 0   |
| Teak, E.I. .... ton          | 11 0 0   | 15 0 0   |
| Sequoia, U.S. .... foot cube | 0 2 3    | 0 3 0    |
| Ash, Canada .... load        | 3 10 0   | 5 0 0    |
| Birch " " " " " " " "        | 3 10 0   | 5 0 0    |
| Rim " " " " " " " "          | 4 0 0    | 6 0 0    |
| Fir, Dantisc, &c. .... 2     | 0 3 0    | 3 10 0   |
| Oak " " " " " " " "          | 2 10 0   | 4 10 0   |
| Canada " " " " " " " "       | 5 10 0   | 7 10 0   |
| Fine, Canada red " " " "     | 3 5 0    | 4 0 0    |
| " " " " " " " " " "          | 3 10 0   | 5 10 0   |
| Lath, Dantisc, " " " " " "   | 4 10 0   | 5 10 0   |
| St. Petersburg " " " " " "   | 0 10 0   | 10 0 0   |
| Waincot, Rye, &c. .... log   | 2 15 0   | 4 5 0    |
| " " " " " " " " " "          | 0 0 0    | 0 0 0    |

| TIMBER (continued).                                  | £. s. d. | £. s. d. |
|------------------------------------------------------|----------|----------|
| Deals, Finland, 2nd and 1st, std. 100                | 8 0 0    | 11 0 0   |
| " " " " 4th and 3rd " "                              | 8 0 0    | 9 0 0    |
| Riga " " " " " "                                     | 7 10 0   | 9 0 0    |
| St. Petersburg, 1st yellow " "                       | 11 0 0   | 15 0 0   |
| " " " " 2nd " "                                      | 10 0 0   | 11 0 0   |
| " " " " " " " " " "                                  | 10 0 0   | 10 0 0   |
| Swedish " " " " " " " "                              | 9 0 0    | 16 0 0   |
| White Sea " " " " " " " "                            | 9 10 0   | 17 0 0   |
| Canada, Fine, " " " " " "                            | 15 0 0   | 26 10 0  |
| " " " " 2nd " " " "                                  | 11 0 0   | 17 10 0  |
| " " " " 3rd, &c. " " " "                             | 8 0 0    | 10 0 0   |
| " " Spruce, 1st " " " "                              | 9 10 0   | 11 0 0   |
| " " " " 2nd " " " "                                  | 8 10 0   | 9 0 0    |
| New Brunswick, &c. " " " "                           | 6 15 0   | 8 15 0   |
| Battens, all kinds " " " "                           | 8 10 0   | 20 0 0   |
| Flooring Boards, sq., 1 in., prepared, First " " " " | 11 0 0   | 0 14 6   |
| Second " " " " " "                                   | 0 8 0    | 0 10 9   |
| Other qualities " " " " " "                          | 0 6 0    | 0 7 9    |
| Cedar, Cuba " " " " " "                              | 0 44 0   | 0 44 0   |
| Honduras, &c. " " " " " "                            | 0 4 0    | 0 4 0    |
| Mahogany, Cuba " " " " " "                           | 0 44 0   | 0 44 0   |
| St. Domingo, cargo average " " " "                   | 0 44 0   | 0 44 0   |
| Tobacco " " " " " "                                  | 0 54 0   | 0 54 0   |
| Honduras " " " " " "                                 | 0 54 0   | 0 54 0   |
| Box, Turkey " " " " " "                              | 4 0 0    | 13 0 0   |
| Rose " " " " " "                                     | 12 0 0   | 23 10 0  |
| Bahia " " " " " "                                    | 14 0 0   | 13 0 0   |
| Satin, St. Domingo " " " " " "                       | 0 6 0    | 0 1 0    |
| Porto Rico " " " " " "                               | 0 9 0    | 0 1 3    |
| Walnut, Italian " " " " " "                          | 0 44 0   | 0 44 0   |

| METALS.                         | £. s. d. | £. s. d. |
|---------------------------------|----------|----------|
| Iron—Bar, Welsh, in London, ton | 5 5 0    | 5 10 0   |
| " " " " " " " " " "             | 4 15 0   | 5 0 0    |
| " " " " " " " " " "             | 5 10 0   | 6 10 0   |
| Cast-iron, in London " " " "    | 5 10 0   | 6 10 0   |
| Copper—                         |          |          |
| British, cake and ingot, ton    | 44 0 0   | 45 0 0   |
| Best selected " " " " " "       | 46 0 0   | 0 0 0    |
| Sheets, strong " " " " " "      | 61 0 0   | 62 0 0   |
| Australian " " " " " "          | 0 0 0    | 0 0 0    |
| Chili, bars " " " " " "         | 37 10 0  | 0 0 0    |
| YELLOW METAL, " " " " " "       | 0 0 0    | 0 0 0    |
| LEAD—Pig, Spanish, " " " "      | 12 17 6  | 12 18 9  |
| English, common, " " " "        | 12 12 6  | 12 13 9  |
| Sheet, English, " " " " " "     | 12 6 14  | 12 6 14  |
| SPELTZ—                         |          |          |
| Slab, special " " " " " "       | 17 10 0  | 17 12 6  |
| Ordinary brands, " " " " " "    | 17 7 6   | 17 10 0  |
| Tin—                            |          |          |
| Straits " " " " " "             | 92 0 0   | 0 0 0    |
| Australian " " " " " "          | 93 0 0   | 0 0 0    |
| English Ingots " " " " " "      | 95 0 0   | 0 0 0    |
| Zinc—English sheet, " " " "     | 21 0 0   | 22 0 0   |
| OILS.                           |          |          |
| Linseed " " " " " " " "         | 18 12 6  | 18 15 0  |
| Cocunut, Cochiti " " " " " "    | 27 0 0   | 24 0 0   |
| Ceylon " " " " " " " "          | 25 10 0  | 0 0 0    |
| Palm, Lagos " " " " " "         | 24 10 0  | 25 0 0   |
| Rapeseed, English pale " " " "  | 28 0 0   | 0 0 0    |
| " " " " " " " " " "             | 28 0 0   | 0 0 0    |
| Cottonseed, refined " " " "     | 32 10 0  | 35 10 0  |
| Tallow and Oleine " " " "       | 19 0 0   | 45 0 0   |
| Lubricating, U.S. " " " "       | 5 0 0    | 8 0 0    |
| " " " " " " " " " "             | 7 0 0    | 8 0 0    |
| Tar—Stockholm " " " " " "       | 1 2 9    | 1 3 9    |
| Archangel " " " " " "           | 0 14 9   | 0 15 0   |

#### CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

##### CONTRACTS.

| Nature of Work, or Materials.               | By whom Required.      | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|---------------------------------------------|------------------------|-----------------------------------|--------------------------|-------|
| Construction of New Main Sewers             | Leicester Corporation  | J. Gordon                         | April 25th               | ii.   |
| Painting Works                              | West London Sch. Dist. | Official                          | April 26th               | ii.   |
| Steam Fire Engine                           | Horsley Local Board    | Official                          | April 26th               | ii.   |
| New Sewers, &c.                             | Comma. of Sewers       | Official                          | April 26th               | ii.   |
| Removal of Road Sweepings & Street Watering | Hackney Bd. of Works   | J. Lovegrove                      | do.                      | xii.  |
| Municipal Cows and Gully Gratings           | do.                    | do.                               | May 1st                  | xii.  |
| Broken Granite                              | do.                    | do.                               | do.                      | xii.  |
| Paving Works                                | Greenwich Bd. of Wks   | Official                          | do.                      | xii.  |
| Painting Brickwork                          | Holborn Union          | H. Saxon Saell & Son              | do.                      | xii.  |
| Broken Granite                              | Graveyard U.S.A.       | Official                          | May 4th                  | xii.  |
| Masonry Brickwork, &c., Tower Bridge        | Corporation of London  | J. Wolfe Barry                    | May 10th                 | ii.   |
| Public Offices                              | Swindon New Town L.B.  | B. Binyon                         | May 11th                 | ii.   |

##### PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised.   | Salary.       | Applications to be in. | Page. |
|------------------------|-----------------------|---------------|------------------------|-------|
| Accountant Clerk       | Civil Service Commis. | Not stated    | May 2nd                | xvii. |
| Road Surveyor          | West Sussex C.C.      | 200 <i>l.</i> | May 8th                | xvii. |

##### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BECKENHAM.**—For alterations and repairs at "Brookhurst," Southend-road, Beckenham, under the direction of Mr. Farncott, 156, Westminster-bridge-road:—  
Peacock Bros. (accepted)..... £119 0 0

**GROUCH END (Middlesex).**—For a bank at Grouch End, for the London and South Western Bank, Limited. Mr. George Truett, architect. Quantities supplied by Messrs. Morris, Evans, & Son:—

|                         |            |
|-------------------------|------------|
| Johnson                 | £4,130 0 0 |
| Faine                   | 3,990 0 0  |
| Smith                   | 3,658 0 0  |
| Stanley Bird            | 3,683 0 0  |
| Shepherd                | 3,427 0 0  |
| Bryan                   | 3,337 0 0  |
| Smith & Son             | 3,333 0 0  |
| Lobb & Olver (accepted) | 3,239 0 0  |

**CROYDON.**—For new business premises on site of the "Swan" Inn, in North-end, Croydon, for Mr. J. Alder, Mr. Alfred Broad, architect, 27, Dingwall-road, Croydon. Quantities by the architect:—

|                                    |            |
|------------------------------------|------------|
| Knight, Morden                     | £2,280 0 0 |
| Page, Croydon                      | 2,235 0 0  |
| King Bros. & Co., Norwood          | 2,190 0 0  |
| Spencer, Croydon                   | 2,179 0 0  |
| Hollingsworth, Peckham             | 2,170 0 0  |
| Holt, Croydon                      | 2,160 0 0  |
| Robson, Lewisham                   | 2,110 0 0  |
| Henley & Co., London               | 2,100 0 0  |
| M. Taylor, Croydon                 | 2,100 0 0  |
| E. R. Peckham, Croydon             | 2,098 0 0  |
| Idle, Clapham                      | 2,073 0 0  |
| J. Smith & Sons, Norwood           | 2,047 0 0  |
| J. J. G. Saunders, Brighton        | 2,040 0 0  |
| Hart Bros., London                 | 1,997 0 0  |
| J. H. Mallett, London              | 1,993 0 0  |
| G. S. Bryan, Norwood               | 1,951 0 0  |
| T. Martin, Maldenhead              | 1,945 0 0  |
| Lobb & Olver, London               | 1,917 0 0  |
| Barton & Sons, Croydon             | 1,895 0 0  |
| Deacon & Co., Norwood              | 1,889 0 0  |
| J. O. Richardson, Peckham          | 1,879 0 0  |
| Smith & Buller, Croydon (accepted) | 1,845 0 0  |
| J. Edmonds, Poplar                 | 1,827 0 0  |



**DEPTFORD.**—For repairs and interior cleaning and painting at the Duke-street School, Deptford, for the London School Board. Mr. T. J. Bailey, architect.—

|                      |         |
|----------------------|---------|
| Davis                | 298 0 0 |
| Barrett & Power      | 300 0 0 |
| Holloway             | 304 0 0 |
| Gale                 | 293 0 0 |
| Crues                | 293 0 0 |
| G. Barker (accepted) | 246 0 0 |

**DUKINFIELD.**—For the erection of three houses in Victoria-road, Mr. J. H. Burton, architect, Warrington-street, Ashton-under-Lyne.—

|                                     |          |
|-------------------------------------|----------|
| Alfred Robinson, Dukinfield         | 5952 0 0 |
| Joseph Taylor, Dukinfield           | 809 0 0  |
| J. H. Gibson, Dukinfield            | 293 0 0  |
| E. Bramall & Son, Stalybridge       | 765 19 0 |
| Geo. Taylor, Dukinfield             | 746 16 0 |
| W. & S. Miles, Stalybridge          | 737 19 3 |
| J. W. Williamson, Ashton-under-Lyne | 731 0 0  |
| Allen Holmes, Ashton-under-Lyne     | 728 6 9  |
| Fulton & Bowness, Ashton-under-Lyne | 727 0 0  |
| Robinson & Co., Hyde                | 720 0 0  |
| B. H. Booth, Stalybridge            | 715 0 0  |
| C. Cropper, Dukinfield              | 710 0 0  |
| T. Warrington, Newton Moor          | 700 0 0  |
| Jao. Robinson, Ashton-under-Lyne    | 698 0 0  |
| G. H. Brown, Dukinfield             | 680 0 0  |
| Underwood & Bro., Dukinfield        | 646 0 0  |

\* Accepted subject to certain alterations.

**ENFIELD.**—For the erection of three shops, Enfield Town, for Mr. E. Gibbons, Messrs. Searle, Halton, & Bowyer, architects, Tottenham-street, Tottenham.—

|                     |            |
|---------------------|------------|
| Wheeler             | £2,095 0 0 |
| Patman              | 1,852 0 0  |
| Monk                | 1,795 0 0  |
| Forster             | 1,777 0 0  |
| Almond & Son        | 1,775 0 0  |
| Fairhead (accepted) | 1,745 0 0  |

**ENFIELD.**—For alterations, &c., at the Endell Lock Distillery. Mr. W. West, architect.—

|               |          |
|---------------|----------|
| J. Walker     | £529 0 0 |
| J. W. Woods   | 512 0 0  |
| W. W. Sharn   | 486 0 0  |
| Gardiner      | 444 0 0  |
| Spencer & Co. | 440 0 0  |
| J. Brooks     | 390 0 0  |

**FOREST GATE (Essex).**—For completing the erection of three shops in the Woodgrange-road, for the executors of the late Mr. John Jones. Mr. James F. Wesley, architect, 276, Romford-road. Quantities supplied.—

|                  |          |
|------------------|----------|
| Alexander        | £201 0 0 |
| Dyer & Sons      | 808 0 0  |
| North Bros.      | 834 0 0  |
| Worley           | 810 0 0  |
| Bishop & Webb    | 785 0 0  |
| Watson           | 777 0 0  |
| Nicholls         | 770 0 0  |
| Baney (accepted) | 770 0 0  |

**HAMMERSMITH.**—For additions to Hammersmith Police Court, for Mr. H.'s Office of Works. Quantities supplied.—

|                        |            |
|------------------------|------------|
| Lyne                   | £3,598 0 0 |
| Gill & Co.             | 3,787 0 0  |
| Chamberlain            | 3,749 0 0  |
| C. Wal                 | 3,274 0 0  |
| W. M. Dabb             | 2,822 0 0  |
| Brickell               | 2,930 0 0  |
| Dorey                  | 2,738 0 0  |
| J. O. Richardson       | 2,622 0 0  |
| Gibbs & Co. (accepted) | 2,460 0 0  |

**HAMPSTEAD.**—For the erection of two cottages, Mount Vernon, for Mr. H. Tucker. Mr. Albert E. Frith, architect, 10, Bedford-square.—

|                  |          |
|------------------|----------|
| Kilby & Gayford  | £246 0 0 |
| Thos. Taylor     | 651 0 0  |
| W. M. Dabb       | 427 0 0  |
| J. C. Richardson | 347 16 0 |

**LONDON.**—For an additional block of buildings at Horton, for the Guardians of the Poor, Hackney. Mr. W. Water Barrett, architect.—

|                   |             |
|-------------------|-------------|
| Ward & Clarke     | £21,316 0 0 |
| Barrett & Power   | 20,717 0 0  |
| J. Willmott & Son | 19,728 0 0  |
| B. E. Nightingale | 19,028 0 0  |
| Hart Bros.        | 19,422 0 0  |
| J. Smith & Son    | 18,947 0 0  |
| McKeon            | 18,797 0 0  |
| Jackson & Todd    | 18,635 0 0  |
| C. Cox            | 18,620 0 0  |
| C. Wall           | 18,600 0 0  |
| J. Longley & Co.  | 18,579 0 0  |
| Kirk Bros.        | 18,550 0 0  |
| W. Shurmer        | 18,344 0 0  |
| W. Watson         | 18,206 0 0  |
| J. Ash & Son      | 18,159 0 0  |
| Kirk & Randall    | 18,120 0 0  |
| Brass & Son       | 17,673 0 0  |
| Garlick & Horton  | 17,499 0 0  |
| Mark Gentry       | 17,450 0 0  |
| Arthur Porter     | 17,133 0 0  |
| J. W. Mollett     | 16,779 0 0  |

**LONDON.**—For alterations at the "Cook" public-house, Stanhope-street, Euston-road, for Mr. W. R. Tenchley, Mr. James Warne, architect.—

|                   |          |
|-------------------|----------|
| Royal & Co.       | £344 0 0 |
| J. Lyne           | 333 0 0  |
| J. Marsland & Son | 329 0 0  |
| Barton & Co.      | 305 0 0  |
| Barrell & Bros.   | 270 0 0  |
| J. Tyerman        | 259 0 0  |

#### For Bar Fittings, &c.

|                       |           |
|-----------------------|-----------|
| Watts & Co.           | £259 17 0 |
| Jno. Warne (accepted) | 316 0 0   |

**LONDON.**—For the reconstruction of No. 5, Sussex-square Mews, Hyde Park. Messrs. N. S. Joseph & Smith, architects, 45, Finsbury-pavement.—

|             |          |
|-------------|----------|
| Bovis & Co. | £493 0 0 |
| Vare Bros.  | 458 0 0  |

**LEICESTER.**—For the erection of engine-house, boiler-house, coal-stores, workshops, manager's house, drainage, and fence walls, at Beaumont Leys Sewage Pumping Station, for the Corporation of Leicester. Mr. Stockdale Harrison, architect. Mr. J. Gordon, C.E., Borough Surveyor.—

Contract No. 7.

|                               |             |
|-------------------------------|-------------|
| Orson Wright, Wigston         | £13,500 0 0 |
| Clark & Garrett, Leicester    | 12,749 0 0  |
| Wenlock & Coe, Peterborough   | 12,618 13 7 |
| W. Binnett & Sons, Sheffield  | 12,389 0 0  |
| Joseph Plant, Leicester       | 12,252 0 0  |
| W. H. Kellist, Leicester      | 12,093 4 11 |
| T. & H. Herbert, Leicester    | 12,069 0 0  |
| Joseph Evans, Walsall         | 12,034 0 0  |
| J. O. Jewsbury, Leicester     | 11,969 0 0  |
| J. Hutchinson, Son, Leicester | 11,811 18 0 |
| G. Hewitt, Leicester          | 11,700 0 0  |
| Chas. Bass, Leicester         | 11,681 0 0  |
| G. Longlen & Son, Sheffield   | 11,435 0 0  |
| Gimman & Son, Leicester       | 11,369 8 8  |
| H. Bland, Leicester           | 11,350 0 0  |
| S. & E. Bentley, Leicester    | 10,816 0 0  |

\* Accepted.

**LEICESTER.**—For the following works at Leicester, for the Corporation. Plans, drawings, specifications, and quantities by Mr. J. Gordon, C.E., Borough Surveyor.—

**Construction of New Dock or Loading Basin at the Corporation Yard, Jarvis-street.**

|                                    |           |
|------------------------------------|-----------|
| S. & E. Bentley, Leicester         | £259 16 0 |
| J. Evans, Ealing, London           | 655 0 0   |
| J. Evans, Walsall                  | 654 16 0  |
| T. Philbrick, Leicester (accepted) | 635 18 6  |

**Erection of New Shaving Forges at the Corporation Yard, Jarvis-street.**

|                                          |           |
|------------------------------------------|-----------|
| E. B. Pipes, Gopsall-street, Leicester   | £415 10 0 |
| T. & H. Herbert, Welford-road, Leicester | 397 10 0  |
| J. Hutchinson, Kent-street               | 326 0 0   |
| N. Elliott, Great Holme-street           | 389 10 0  |
| J. O. Jewsbury, Oxford-street            | 374 19 0  |

\* Accepted.

**Erection of New Offices at the Leicester Cattle Market, Jarvis-street.**

|                                   |          |
|-----------------------------------|----------|
| T. & H. Herbert, Leicester        | £251 0 0 |
| J. O. Jewsbury, Leicester         | 240 10 0 |
| Duxbury & Son, Leicester          | 240 10 0 |
| H. Bland, Leicester               | 240 0 0  |
| E. P. Hutchinson, Leicester       | 238 10 0 |
| E. B. Pipes, Leicester (accepted) | 235 0 0  |

**Construction of Storm-water Sewer along the Hinckley and Fosse Roads.**

|                                 |          |
|---------------------------------|----------|
| James Evans, London             | £204 2 6 |
| T. Philbrick, Leicester         | 141 4 8  |
| S. & E. Bentley, Leicester      | 132 6 6  |
| John Smith, Belgrave, Leicester | 130 6 4  |

\* Accepted.

**Erection of Hurdle Fencing, Post and Rail Fence, and Gates, at Leicester Cattle Market.**

|                                   |          |
|-----------------------------------|----------|
| S. Wright, Leicester              | £170 4 0 |
| W. T. Burridge, Leicester         | 165 0 0  |
| Gimman & Co., Leicester           | 153 11 0 |
| Goodwin, Barsby, & Co. (accepted) | 128 4 10 |

**Erection of Water-closets and Lavatories for Gentlemen at Leicester Cattle Market House.**

|                                          |          |
|------------------------------------------|----------|
| Duxbury & Son, Leicester                 | £248 5 0 |
| E. B. Pipes, Gopsall-street, Leicester   | 145 5 0  |
| Harry Bland, Oxford-street, Leicester    | 114 0 0  |
| J. O. Jewsbury, Oxford-street, Leicester | 111 18 0 |

\* Accepted.

**LEWISHAM.**—For the erection of two shops, High Pavement, Lewisham, S.E., for Messrs. Chappell & Sons. Mr. Albert L. Guy, architect.—

|                          |            |
|--------------------------|------------|
| Holloway                 | £1,395 0 0 |
| Jerrard                  | 1,173 0 0  |
| Kennard Bros. (accepted) | 1,070 0 0  |

**LONDON.**—For rebuilding the "Royal Albert" public-house, Freeman's-road, Victoria Dock, E. Mr. George Stooke, architect, Leytonstone. Quantities by Mr. William Brett, 10, Charing Cross-road, W.C.—

|                                  |            |
|----------------------------------|------------|
| W. Greagar                       | £2,480 0 0 |
| J. Walker                        | 2,449 0 0  |
| Mark Gentry                      | 2,350 0 0  |
| J. W. Wyles                      | 2,348 0 0  |
| W. Perry                         | 2,348 0 0  |
| A. Hood, 471, Bethnal Green-road | 2,296 0 0  |
| O. Bonney                        | 2,293 0 0  |
| Jackson & Todd                   | 2,289 0 0  |

\* Accepted.

**LONDON.**—For erecting fourteen blocks of dwellings in Brady-street, Whitechapel. Messrs. N. S. Joseph & Smith, architects, 45, Finsbury-pavement. Quantities by Messrs. F. J. Green & Pieterse.—

|                       |             |
|-----------------------|-------------|
| Outlwaite & Son       | £32,900 0 0 |
| R. L. Heald, & Co.    | 31,540 0 0  |
| Mark Patrick & Son    | 31,200 0 0  |
| Collins & Hannen      | 30,987 0 0  |
| Patman & Fotheringham | 30,894 0 0  |
| Holt & Son            | 30,665 0 0  |
| Ashby & Horner        | 30,247 0 0  |
| Wm. Shepherd          | 29,806 0 0  |
| Wm. Brass & Son       | 28,223 0 0  |
| Brown & Son           | 27,729 0 0  |
| Kirk & Randall        | 27,380 0 0  |
| Mark Gentry           | 27,155 0 0  |
| Peto Bros.            | 26,147 0 0  |

**LONDON.**—For improvements to Victoria Station, for the London, Brighton, and South Coast Railway Company. Mr. F. D. Banister, engineer. Quantities supplied by Mr. C. Gough.—

|                                               |                  |
|-----------------------------------------------|------------------|
| J. O. Richardson, Albert Works, Peckham, S.E. | £215 (accepted). |
|-----------------------------------------------|------------------|

**LONDON.**—For alterations at Nos. 11 and 12, Little St. Andrew-street, St. Martin's Lane.—

|                                     |          |
|-------------------------------------|----------|
| Watson                              | £496 0 0 |
| Longley                             | 437 0 0  |
| Croft                               | 393 0 0  |
| Hood, Bethnal Green-road (accepted) | 381 0 0  |
| Bishop & Watson                     | 370 0 0  |

**LONDON.**—For the erection of new police-court at Dalston, for H.M. Commissioners of Works.—

|                    |             |
|--------------------|-------------|
| C. Fixman          | £11,865 0 0 |
| Lobb & Oliver      | 10,710 0 0  |
| J. H. Johnson      | 10,433 0 0  |
| W. Goodman         | 10,330 0 0  |
| J. Godfrey & Son   | 10,278 0 0  |
| Barrett & Power    | 10,166 0 0  |
| W. Brass & Son     | 9,943 0 0   |
| W. H. Lorden & Son | 9,869 0 0   |
| Ferry & Co.        | 9,744 0 0   |
| W. Shurmer         | 9,720 0 0   |
| J. Shillito & Son  | 9,320 0 0   |
| J. Longley & Co.   | 9,275 0 0   |
| Mark Gentry        | 9,275 0 0   |
| Kilby & Gayford    | 9,228 0 0   |
| W. M. Dabbs        | 9,047 0 0   |

**LONDON.**—For erecting an addition to a leather factory situate in Juniper-street, Shadwell, for Messrs. S. E. Norris & Co. Mr. Charles Dunch, architect. Quantities by Mr. James F. Wesley, Forest-gate.—

|                        |            |
|------------------------|------------|
| Dove                   | £3,375 0 0 |
| Movlen & Co.           | 3,196 0 0  |
| Nightingale            | 3,080 0 0  |
| Chappell               | 2,876 0 0  |
| Grover & Son           | 2,799 0 0  |
| Mortier                | 2,780 0 0  |
| J. & J. Greenwood      | 2,754 0 0  |
| Rider & Son            | 2,776 0 0  |
| Colls & Sons           | 2,760 0 0  |
| Shurmer                | 2,744 0 0  |
| Harris & Wardrop       | 2,744 0 0  |
| Gentry                 | 2,738 0 0  |
| Ashby & Horner         | 2,610 0 0  |
| W. Shepherd (accepted) | 2,585 0 0  |

**LONDON.**—For rebuilding premises at the corner of Great Queen-street and Little Queen-street, Lincoln's Inn. Messrs. N. S. Joseph & Smith, architects, 45, Finsbury-pavement.—

|                       |            |
|-----------------------|------------|
| Patman & Fotheringham | £2,428 0 0 |
| Wm. Shepherd          | 2,350 0 0  |
| G. S. Williams & Son  | 2,347 0 0  |
| Mark Patrick & Son    | 2,312 0 0  |

**LONDON.**—For improvements at the "Elephant and Castle Tavern," South Lambeth-road, for Messrs. Foote & Venner. Mr. R. A. Lawcock, architect, 85, Bishopsgate-street Within, E.C.—

|               |            |
|---------------|------------|
| Smith         | £1,123 0 0 |
| Stephenson    | 1,015 0 0  |
| Burman & Son  | 990 0 0    |
| Spencer & Co. | 945 0 0    |

**Peckering.**

|                 |         |
|-----------------|---------|
| Quin (accepted) | 102 0 0 |
|-----------------|---------|

**Gaffling.**

|                 |         |
|-----------------|---------|
| Winn (accepted) | 209 0 0 |
|-----------------|---------|

**LONDON.**—For rebuilding No. 86, Tottenham-count-road. Mr. H. H. Collins, architect.—

|                   |            |
|-------------------|------------|
| Titmas            | £1,699 0 0 |
| Scriveners & Co.  | 1,688 0 0  |
| Croaker & Co.     | 1,660 0 0  |
| E. Toms           | 1,646 0 0  |
| C. Ward & Co.     | 1,600 0 0  |
| Brown, Son, & Co. | 1,577 0 0  |
| J. R. Hunt        | 1,520 0 0  |
| Veale             | 1,613 0 0  |
| Goold & Brand     | 1,497 0 0  |
| Lamble            | 1,479 0 0  |
| W. Shurmer        | 1,440 0 0  |
| J. H. Thompson    | 1,390 0 0  |

**LONDON.**—For additions, alterations, repairs, and bar-sittings at the "World Turned Upside Down" public-house, Old Kent-road, S.E., for Mr. J. Kirk. Mr. J. C. Reynolds, architect, 30, Camberwell-green.—

|                  |            |
|------------------|------------|
| C. & H. Cocks    | £1,685 0 0 |
| Croaker          | 1,650 0 0  |
| Drew & Cadman    | 1,489 0 0  |
| Joselyne & Young | 1,435 0 0  |
| Jackson & Todd   | 1,428 0 0  |
| Parker           | 1,389 0 0  |

**LONDON.**—For alterations and additions to the Lying-in Hospital, City-road. Mr. H. H. Collins, architect.—

|                |            |
|----------------|------------|
| Ben            | £1,166 0 0 |
| W. Shurmer     | 1,044 0 0  |
| Veale          | 889 0 0    |
| Ward           | 879 0 0    |
| Roberts        | 853 0 0    |
| Chessman & Son | 724 0 0    |

**LONDON.**—For repairs and alterations to "Brant House," South Hackney. Mr. W. Gilbee Scott, architect.—

|                 |          |
|-----------------|----------|
| F. & F. J. Wood | £893 0 0 |
| T. Boyce        | 820 0 0  |
| R. W. Beale     | 816 0 0  |
| W. Shurmer      | 806 0 0  |
| C. Cox          | 885 0 0  |
| W. Harper       | 820 0 0  |

**LONDON.**—For general repairs to twenty-two houses in Waxwell-terrace, 12, Upper Marsh; and 31, Dlythe-terrace, Lambeth.—

|                         |          |
|-------------------------|----------|
| Rogers                  | £233 0 0 |
| Laphorne & Co.          | 607 0 0  |
| Lorden & Son (accepted) | 609 0 0  |

**LONDON.**—For the erection and completion of a lecture hall and gymnasium in rear of the "De Laune Institute," Kennington Park-road. Quantities supplied by—

|                  |          |
|------------------|----------|
| Tyerman          | £274 0 0 |
| Landfield        | 750 0 0  |
| Ansell           | 678 0 0  |
| Deacon           | 650 0 0  |
| Laphorne         | 526 0 0  |
| J. O. Richardson | 569 0 0  |
| Flew & Co.       | 544 0 0  |

**LONDON.**—For warming the school in Prospect-place, Gray's-inn-road, for the School B.-ard for London. Mr. T. J. Bailey, architect.—

|                              |          |
|------------------------------|----------|
| Jones & Attwood, Stourbridge | £235 0 0 |
|------------------------------|----------|

\* Accepted.



LONDON.—For pulling down and rebuilding No. 3, Bostock-street, St. George's-in-the-East, for Mr. J. M. Winn. Mr. J. F. Wesley, architect, 276, Romford-road, Forest-gate:—

|                         |      |
|-------------------------|------|
| Wordley                 | 4516 |
| Bishop & Webb           | 446  |
| Falmer & Co.            | 425  |
| Marchant                | 425  |
| Wyles                   | 365  |
| Baney                   | 360  |
| North Bros. (withdrawn) | 315  |

LONDON.—For alterations, bar-stings, &c., at the "Crown and Thistle" public-house, Old South Lambeth-road, for Mr. R. Hudson. Mr. James Warne, architect:—

|                       |            |
|-----------------------|------------|
| J. Marsland & Son     | £1,165 0 0 |
| J. Tyerman            | 1,100 0 0  |
| H. & J. Hubbard       | 990 0 0    |
| Barton & Son          | 810 0 0    |
| A. Collard (accepted) | 775 0 0    |

LONDON.—For repairs and decorations at the "Bricklayers' Arms" tavern, Old Kent-road, for Mr. Sambrook. Mr. James Warne, architect:—

|                  |          |
|------------------|----------|
| Balam Bros.      | £350 0 0 |
| J. Walker        | 327 0 0  |
| A. Collard       | 325 0 0  |
| Blake (accepted) | 320 0 0  |

LONDON.—For repairs and decorations at 55, Highbury Park, N., under the direction of Mr. Parnacott, 156, Westminster-bridge-road:—

|                  |          |
|------------------|----------|
| Davey (accepted) | £140 0 0 |
|------------------|----------|

LONDON.—For sundry decorative and other repairs at No. 55, West Cromwell-road, South Kensington, S.W., for Mr. Thos. Huggitt. Mr. Walter J. Ebbetts, architect, Savoy House, 115, Strand, W.C.:—

|                                       |           |
|---------------------------------------|-----------|
| C. F. Kearsley, Kensington (accepted) | £127 10 0 |
|---------------------------------------|-----------|

MANCHESTER.—For new fruit-preserving works for Messrs. H. Faulder & Co. Mr. J. D. Barker, architect, 76, King-street, Manchester. For ironwork in columns, roof, &c.:—

|                                                                |            |
|----------------------------------------------------------------|------------|
| De Bezruce & Co., schedule tender accepted, amounting to about | £1,900 0 0 |
|----------------------------------------------------------------|------------|

NORWOOD.—For alterations and repairs at Addiscombe House, Broomfield Park, Norwood, under the direction of Mr. Parnacott, 156, Westminster Bridge-road:—

|                 |           |
|-----------------|-----------|
| Read (accepted) | £169 18 0 |
|-----------------|-----------|

PLAISTOW.—For the erection and completion of factory premises, chimney-shaft, &c., at Butcher's-hedge-lane, Plaistow, West Ham, Essex, for Messrs. W. Goodacre & Sons. Mr. Thomas Fletcher, architect, 73, Bow-road, E.:—

|               |            |
|---------------|------------|
| Read          | £9,676 0 0 |
| Nightingale   | 8,543 0 0  |
| Peto Bros.    | 8,519 0 0  |
| Lawell        | 8,500 0 0  |
| Hearle & Son  | 8,370 0 0  |
| Mortier       | 8,143 0 0  |
| Ferry & Co.   | 8,073 0 0  |
| Hunt          | 8,016 0 0  |
| Higgs         | 7,900 0 0  |
| J. & H. Cocks | 7,800 0 0  |
| J. Walker     | 7,870 0 0  |
| Morton & Son  | 7,367 0 0  |
| Gentry        | 7,085 0 0  |
| Shurmer       | 6,677 0 0  |

PORTO ALEGRE (Brazil). For machinery and plant for Brazilian Extract of Meat and Hide Factory, Limited, Porto Alegre, Brazil, to the designs of Mr. Frederick Colyer, Civil Engineer, 15, Great George-street, Westminster, S.W.:—

Contract No. 1.—Extract of Meat Plant.  
Pontifex & Wood (accepted) ..... £1,654 0 0

Contract No. 2.—Patent Water-tube Boilers.  
Babcock & Wilcox Co. (accepted) ... £983 10 0

Contract No. 3.—Charcoal Plant.  
George Waller & Co. (accepted) ... £498 0 0

ROSBETH (North Wales).—For warming by hot-water pipes the residence of Mr. Francis Fox, Mount Allyn:—

|                                    |          |
|------------------------------------|----------|
| Repton Gibbs, Liverpool (accepted) | £104 0 0 |
|------------------------------------|----------|

STUBBINGTON.—For the erection of a new wing to residence, Seafield Park, for Sir F. H. Sykes, Bart. Mr. Wm. Yearly, architect, Gosport. Quantities supplied:—

|                       |            |
|-----------------------|------------|
| Crowd                 | £3,900 0 0 |
| J. Plummer            | 3,801 0 0  |
| Light Bros.           | 3,598 0 0  |
| Hill & Co.            | 3,590 0 0  |
| Crockerell (accepted) | 3,253 0 0  |

STUBBINGTON.—For the erection of additions to Stubbington Lodge, for Mr. Montagu H. Foster. Mr. Wm. Yearly, architect, Gosport. Quantities supplied:—

|                       |             |
|-----------------------|-------------|
| Vincent               | £2,719 1 10 |
| Luks & Son            | 1,640 0 0   |
| Wareham               | 1,618 10 0  |
| Leah & Son            | 1,498 0 0   |
| Dash                  | 1,481 0 0   |
| Franklin              | 1,490 0 0   |
| Tuite                 | 1,477 14 0  |
| Light Bros.           | 1,417 0 0   |
| Cork                  | 1,310 0 0   |
| Crockerell            | 1,390 0 0   |
| Plummer               | 1,370 0 0   |
| Crowd                 | 1,300 0 0   |
| Hill & Co. (accepted) | 1,265 0 0   |
| Leamouth              | 1,211 16 3  |

STUBBINGTON.—For the erection of a pair of houses for Mr. Montagu H. Foster. Mr. Wm. Yearly, architect, Gosport. Quantities supplied:—

|                    |          |
|--------------------|----------|
| Hill & Co.         | £749 0 0 |
| Luks & Son         | 734 0 0  |
| Light Bros.        | 709 0 0  |
| Crowd              | 698 0 0  |
| Dash               | 610 7 0  |
| Wareham            | 690 1 6  |
| Roberts            | 636 0 0  |
| Crockerell         | 590 0 0  |
| Plummer (accepted) | 580 0 0  |

STUBBINGTON.—For the erection of new class-rooms at Stubbington Lodge, for Mr. T. Eastman. Mr. Wm. Yearly, architect, Gosport:—

|                       |          |
|-----------------------|----------|
| J. Plummer            | £165 0 0 |
| C. Wareham (accepted) | 146 10 0 |

Mission Church, Slough, Bucks.—In regard to the list of tenders for this work, printed by us last week, we are informed that Mr. Bowyer's tender was accepted by the trustees, not the tender of Mr. Jarvis, as stated.

### TO CORRESPONDENTS.

J. M. (thanks).—O. J. & A. W. cannot insert letters asking such elementary questions. Any text-book on the subject of Limes and Cements will give you the information.—G. D. O.—J. N.—J. F.—R. A.—O. J. & A. W. (below our mark).—List of London was not received this week from R. F. M. H. O. J. O. R. W. H. B., and J. V. & Co. They shall appear next week. All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, for not necessarily for publication. We are compelled to delete repeating out books and giving addresses. Note.—The responsibility of literary and artistic matters read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications beyond mere news items, which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR, all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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# The Builder.

Vol. LVI. No. 2122.

SATURDAY, APRIL 27, 1899.

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### The Railways of England.



It is to be hoped that Mr. Acworth's popular book on this subject\* will be largely read by the English public, partly because those who read it are certain to be interested in it as a matter of mere entertainment, partly because it is calculated to give the general public a little more idea than most of them have of the great achievements and the high merit of our English railway system, of the admirable manner in which the great lines are worked, and of the remarkable combination of forethought on the part of the working management with discipline and attention to duty on the part of thousands of subordinates, by which alone the traffic of our great lines could be carried on with the speed and regularity of working which mostly characterises it. To those who have paid any degree of intelligent attention to English railway working it ought to be impossible to contemplate the spectacle without something of enthusiasm, without a feeling that it is a thing for the country to be proud of. As the author observes, "When discipline, organisation, and mechanical appliances have done their utmost, the fact yet remains that each time we enter a train life and limb are at the mercy of every driver and pointsman along the line,—and in 1887 there was but one single train accident by which any passenger lost his life. And yet, though drivers and pointsmen are simply samples of the stuff of which the rest of the English working classes are composed, we prate of the decadence of English character and the degeneration of the race of English manhood." This is one of the examples of the healthful and bracing effect on human character of the systematic discipline of numbers in contributing to carry out one great end, and of the sense of serious responsibility thereby evoked. Perhaps also some readers who have not thought of it before may realise, in reading a book of this kind, something of the almost romantic interest

which attaches to a great railway system, with its far-stretching territory, its squadrons of locomotives embodying the most perfect construction that mechanical design and skill can turn out, and its army of workers; instead of being content, as the average Englishman now is, to regard a railway carriage as a vehicle to get into and out of again with no more interest than if it were a street omnibus, and without a thought as to how it is all done.

The author tells us he went to Liverpool and Manchester two years ago to get materials for a magazine article, and the ultimate result is a volume of over 400 pages on the working of English railways. Such a book would hardly have been complete, of course, without an introductory chapter on the early days of railways, and what now seems the extraordinary scepticism of that day as to the future powers and performances of railway traffic. This chapter of the subject has been often written, and we need only remark that Mr. Acworth shows a creditable avoidance of the old stock stories, and gives some with which few readers, at all events, are familiar. We may observe that the *Athenaeum* of 1843 is credited, on the other hand, with a remarkable degree of foresight (in one sense) in declaring that the expenditure for obtaining practically level roads showed want of faith in the capabilities of the locomotive engine, and that it "could climb the mountain-side as well as career along the plain." It was not till many years after the date of this utterance that locomotives superseded ropes on certain heavy inclines, and it was only very recently that Mr. Webb's compound engine achieved taking heavy trains up the Shap incline without an auxiliary engine. So far this prophetic belief in the power which could be exercised by the mere grip of a smooth wheel on a smooth rail (which, in spite of custom, still seems extraordinary) has been justified; but in favour of speedy travelling experience has proved that the level road was worth the expenditure. The effect which a slight gradient has upon speed and on the economical question of getting the best out of the engine is strikingly illustrated in the author's account of his experimental trip on the engine of a fast train from Paddington to Swindon, and back by an up train, in order to ascertain the facts as to the alleged increased difficulty in keeping time on the down journey. The story should be read in the book (pages 25-9), but the result was that to keep time to Swindon was an obvious struggle,

and the other way it was an easy run in two minutes under the allowed time, the heaviest gradient being only 1 in 660 and great part of the way 1 in 1,320. It would seem, therefore, that the early expenditure on reducing gradients was well laid out for the future of fast travelling, though experience has shown that the powerful and heavy modern locomotive can climb gradients which were once thought to be impracticable.

The main portion of Mr. Acworth's book is occupied with an account of the special characteristics and working of the four great railways, London and North-Western, Midland, Great Northern and Great Western, the remainder of the important lines occupying a smaller space. It may be a question whether the Great Western has a claim to be bracketed with the other three, except in regard to its geographical importance as the great trunk line for the southern counties; its progress has been noteworthy of late years, both in working order and management and in the remarkable recuperation of its financial position, which has been greater than even the improvement in management would seem adequate to account for. But there still lingers about the Great Western, its road, its stations, and the stamp of its personnel, a half-antiquated air, which contrasts strongly with the completeness and the finish of everything on the other three lines of first magnitude, and with the alertness of their officials and employés. One reason we have seen suggested for this (not by the present author) is that the comparatively easy-going character and life of the south counties population offers little stimulus to the railway management, southerners being content with a railway service which would never satisfy the more energetic and busy manufacturing populations of the north. In regard to the long runs northwards, also, the three other companies are rivals and have all the spur of rivalry, while the Great Western has a monopoly in its long-distance routes. The Great Western runs very fast for a considerable portion of its course, but it has no more that pre-eminence for high speed which the wide gauge gave it in earlier days, seeing that under improved roadmaking and engine and carriage building the same speeds can be, and are now, safely attained on narrow-gauge roads. After we have passed Exeter going west the average of speed begins to drop, after we have passed Plymouth it becomes a comparative jog-trot. No one seems in a hurry in these south-western counties. But the fact

\* The Railways of England (North-Western; Midland; Great Northern; Manchester, Sheffield and Lincoln; Great Eastern; South Western; Great Western; Great Southern; Brighton and South Coast; Chatham and Dover; South Eastern). By W. M. Acworth. With 50 illustrations. London: John Murray. 1899.



probably is that the Great Western is still suffering from the effects of Brunel's ill-judged ambition for a giant gauge. There was much to be said for it at first. As observed, the running was splendid on it in comparison with the early narrow-gauge roads, and speeds were attained on it which could not then be attained elsewhere. But Brunel failed to foresee the future importance of uniformity of gauge for working into the systems of other companies, when the railway network of the kingdom became further extended. Moreover, the broad-gauge carriages, save for their (at that time) exceptionally smooth running, presented no advantage over the narrow gauge; the early models were painfully cramped in the longitudinal direction, the seats too close together, and even with the later and more sumptuous vehicles there is a cavernous effect in this deep interior which is repellent to passengers, as may be seen by the prospecting for "corner seats" which takes place as much as half-an-hour before the starting time of the Great Western expresses: the passenger feels deprived of light and air in the centre seats to an extent that is not felt in a narrow-gauge carriage. Then the weight of the rolling-stock knocked the road about very much, and rendered maintenance and repairs heavy, an evil probably aggravated by the exceedingly injudicious method of laying the rails on continuous balks of timber, which of course tended to cant at the ends with the slightest subsidence of the ground, instead of on the cross-sleepers which give the weight so much wider a ground base. For all these reasons it is clear that the broad gauge must eventually go, and the company seem to be holding on to make the most of it so long as the existing broad-gauge rolling stock lasts, and until the moment shall come for converting the western portion of the line, which is still broad gauge only, into narrow. Mr. Acworth says in so many words that the reason Reading Station is allowed to remain in so wretched a plight is that it would cost 10,000*l.* more to build a new station for mixed gauge than for narrow only, and that the reconstruction is put off on that account. This seems to us to supply an intelligible reason for the generally worn-out and shabby appearance of many other things about the Great Western line. No other line of equal pretensions and prosperity would tolerate such a station as that at Bath for instance, to so important a town; and the long-lingering existence of the picturesque but not very safe wooden trestle viaducts in the western region is perhaps to be explained from the same cause. The line is lying under the shadow of a mistake made in the outset of its career,—one of its brilliant engineer's "experiments,"—interesting and ambitious, no doubt, but somewhat costly to posterity.

The author follows the popular idea in giving the place of honour in his book to the London and North-Western railway, and his and the popular idea is on the whole correct. Its prosperity is of the earliest date, its territory is immense, its revenue comes in, in the busy season, at the rate of 26*l.* a minute. In the matter of working it is difficult to say where there is much choice between the three, perhaps: the Midland excels it in the comfort of its saloon carriages; the Great Northern in certain brilliant feats of speed. But there is a steady-going and all-round excellence about the management of the London and North-Western which impresses one as being superior to any other railway management in a general way, though it may be difficult to name any precise point of superiority in detail. We learn for the first time from Mr. Acworth's pages that among its rivals it has a bad eminence for parsimony. "Everybody knows that North-Western engines are painted black, but everybody does not

know that this is because black is the cheapest colour." This would be a virtue in the eyes of shareholders, however; and indeed, Mr. Webb, the superintendent of the Crewe Works, in answer to this accusation, said that as soon as his shareholders were getting ten per cent. for their money, he was quite ready to cover his engines with gold-leaf. But it is not hinted by the author that there is parsimony in regard to anything that concerns efficiency and safety in working. The London and North-Western attempts nothing sensational; it has the advantage of a splendidly-laid road with few gradients of any consequence; and it keeps up a programme of speed and punctuality adhered to as an everyday matter.

Mr. Acworth regards Crewe as the centre of the system, and has a good deal to say as to the work that goes on there. At Crewe Works everything required on the line is made. The North-Western alone, we are told, among English companies, rolls its own rails. Every large company now builds its own rolling-stock, but the North-Western makes for itself many things that other companies are content to purchase. Mr. Acworth found a man at Wolverton Works employed in etching designs upon the ground-glass plates that were to form the windows of lavatory compartments, and was told that the company had recently discovered that it could do this work for itself at half the price it had formerly paid. The rail-rolling is described and illustrated, and some notes are given as to the steel permanent way (one of Mr. Webb's patents), with steel sleepers and spring chairs which take the place of the usual oak wedge or key which keeps the rail tight in its place. About thirty miles of the London and North-Western Railway are now laid with these steel sleepers, and the author states (without taking sides with the steel) that he could not perceive the road to be any less elastic than the wooden sleeper road, even when he knew he was going over it. As to the spring chairs we are antagonistic. They may be very neat and compact in working, but we have no belief in the permanency of anything that depends on springs. An oak key will sometimes drop out, it is true, and the spring will not; but springs will work loose and leave the rail shaky, and an oak wedge seems a far more scientific method of getting firm grip of the rail without jarring, leaving just the amount of elasticity of the wood as a buffer between the outer jaw of the chair and the blow of the flange inside the rail. Touching on this point of keys, it is remarked that the Midland has followed the practice (though the author hints that they are changing their mind) of keying inside instead of outside the rail, on the ground that if a key inside drops out from shrinkage, the rail is held in place against any outward blow by the chair arm on the outer side, whereas if an outer key dropped, the rail might be bent out at that point,—all the heavy blows on the rail naturally being from inside outwards. We have not noticed the practice, but we should certainly distrust it on general constructive principles, as likely to make a more noisy and rigid road than with the keys outside, and unless two adjacent keys drop out (which chances are much against) there is not much danger of the shifting of the rail before the absence of the key is discovered. Of course the manner of laying the road makes an immense difference in the comfort in travelling, for reasons which are little thought of by the travelling public. Mr. Acworth recommends any one who is sceptical to close his eyes and listen as the "Flying Scotchman" goes through Doncaster on its way northward. "He will be very dull of hearing" if he does not recognise the point where the train passes from Great Northern to Great Eastern territory; the reason being that the latter railway finishes off the ballast level with the sleepers, leaving the chairs bare and the rails suspended; the Great Northern cover the sleepers entirely and pack the ballast almost flush with the head of the rail. "The difference in noise and

vibration is simply enormous." We should doubt whether anything that has been suggested will make as good a road as the wooden sleeper in well-laid ballast, but the steel sleepers may prove an economy in the long run, no doubt. The question whether they should come into general use is of no little commercial importance, seeing that steel sleepers for the Great Britain railway system alone would amount, according to the author's figures, to 4,000,000 tons of steel.

Something is of course to be said as to the compound engines of recent invention. Mr. Acworth admits, as others have done, that it is exceedingly difficult to get at the real data for estimating the economy claimed for this system. Mr. Webb's compound, with the central low-pressure cylinder, claims to effect a saving of 6 lbs. a mile in coal. It may be doubted however whether this economy is not balanced by greater cost in building, greater friction and greater expenditure of oil &c. The fact remains, however, that Mr. Webb's compound engine for the first time took a train up the Shap incline without an auxiliary engine, which looks like a direct economy so far. Mr. Worsdell's compound engine, with two cylinders only, high and low pressure, and therefore simpler in make and action, seems more like achieving economy; the North-Eastern Company have been having twenty engines built of exactly similar make except that one half are compound, as a test, and we are told the latest news is that the compounds can give the others 5 lbs. a mile of coal and beat them. We should prefer to hear of reliable statistics in favour of the Webb compound, because it is such a grand-looking machine; the two cylinders of the Worsdell, one large and the other small, look lopsided and awkward.

One of the interesting points in railway working described is the marshalling of wagons for goods trains at Edge-hill. The object is that those to be dropped at the earlier stations should be in front of the train those later at the back. The wagons which are for the same place, which may be standing in any promiscuous order, are all chalked with the same number, and allowed to run by gravitation down an incline into the corner of a system of rails laid somewhat like the bars of a gridiron, and a pointsman at the corner reads their number and turns all with the same number on to the same line in the gridiron. They are thus grouped according to destination, being checked at the proper place either by men ready to put the breaks on, or by a cleverly contrived automatic grappling-hook between the rails. These groups are then run out (again by gravitation) one after the other at the opposite corner of the gridiron, till they are all ranged on a single line again, but with the groups one behind the other in the required order. But for this prior arrangement, of course, immense time would be consumed in picking them out and shunting backwards and forwards at the various stations. As it is the engine has only to take the first group off into a siding, at the first station, and go on with the rest.

One portion of the L. & N. W. R. which may be said to be not equal to the fame and importance of the line is its terminal station at Euston, which, in spite of the dignity of its cold-looking central hall, is very deficient in general dignity and finish and platform space, and perhaps it is only the great difficulty of carrying on such an undertaking without deranging the traffic that has led to its rebuilding being deferred; though whenever that may be done, we rather hope that the venerable Doric portico, an interesting witness of the taste of a former day, may be spared. The Midland certainly cuts out the North-Western in dignity of terminal accommodation, a luxury which has cost the company no less than 9,000,000*l.* Part of this went in the goods depot. "It stands upon the site of 600 houses, and the upper floor,—for the depot is in two tiers,—consists of 16,000 tons of iron plates" &c., and it contains within its area no less than seven miles of railway. The clearing of the site was a work of years, and in some cases eight or ten different rights had

\* It was probably on this account that the old model of Great Western engines were made without flanges, the driving-wheels, which merely ran on the upper surface of the rail, the leading and trailing wheel flanges being depended on to keep the engine in its place. It would be interesting to know on what statistics this plan has been recently abandoned.



to be bought up before possession could be taken of a single house. The wrought-iron screens separating the yard from Euston-road, which the author alludes to, are not work to be enthusiastic about, but they were well intended and are at least "handsome"; as may be said (in spite of Scott's name) of the great hotel, the style of which is rather out of date to the architectural taste of the present generation. One of the first points we notice in the chapter on the Midland is in regard to the Lickey incline, "the steepest piece of railway on a main line in Great Britain." The gradient is 1 in 37, and the proposal to run locomotives up it was considered exceedingly bold at the time. An English locomotive built for the task could not take its own weight up the hill, and the first engines for the purpose were procured from America. The remarks of the author on the problem of the Lickey incline under present circumstances have a bearing on the question above adverted to as to the economy of making level lines, and are of sufficient interest to quote:—

"Whether the directors of the Midland have as good reasons to be satisfied of the wisdom of ever climbing the Lickey hills at all, is a different question. Modern engines have not increased in power faster than modern trains have increased in weight, and the Lickey incline implies to-day the constant maintenance of five 'banking' engines\* to work it. Five engines at the most moderate estimate means 5,000*l.* a year, a sum which, if capitalised, would buy a good deal of property in the very heart of the town of Bromsgrove; for the line, it should be said, was constructed in its present position in order to economise in the matter of land. Nor is expense the only thing. For the two miles between Blackwell and Bromsgrove seven minutes is allowed even for the fastest express. Every train going west, for all its continuous brakes, must stop at Blackwell to pick up a brakeman, and then stop a second time at Bromsgrove to set him down again. On the return journey it must stop at Bromsgrove for the banking engine to join on behind, and then pant slowly and laboriously up the hill. As for goods traffic, if any one wants to see brake-blocks on fire, let him ride down the Lickey incline on the tail van of a heavily-laden coal train, with the side-brake of every second truck pegged down as tight as the brakeman can fasten it."

What Crewe is to the North-Western, Derby is to the Midland, and the author does justice to this great workshop, and to the speed, punctuality, and excellent working of the line. Mr. Acworth mentions one run of 99½ miles, Leicester to London, leaving the former at 5.56, and being timed to run the distance in two minutes over the two hours. When he got out at St. Pancras the clock gave 7.53, which he could hardly believe till confirmed by his own and the guard's watch. Considering the gradients are many and heavy, this was a feat. In the description of the shop-work at Derby, a tolerably detailed account is given of the "Forging of Crank-axes," which the author suggests might be a subject for poetry, as much as the "Lay of the Bell." The forging comes to Derby, from Sheffield, in the rough. The first thing done when it comes to Derby is to cut out of each of the "throws" a slice wide enough to allow the "big-end" (of the connecting-rod) to pass through. One slice goes to the laboratory for chemical testing, the other to the mechanical testing-room. If the tests are not satisfactory, the axle is returned. Such are the precautions which modern fast travelling requires, even when we are dealing with steel. It would be amusing, were not the subject so tragical, to read the indignation expressed by writers in newspapers when a serious accident is caused by an axle breaking; fortunately a rare occurrence now, but one which no human foresight can absolutely guard against; yet persons who are ignorant of the manifold precautions taken to have safe metal in the axles regard the company as having a moral complicity in the accident.

The author does not think, nor do we, that the Midland made a good or useful move for the public in abolishing the second-class carriage; but the public owe them an immense debt for starting the practice of "third class on all trains," which has received the

\* In railway phraseology, a "bank" is an incline; a bank engine, or banking engine, is an auxiliary engine to assist in drawing the train up the "bank."

compliment of imitation by two other of the great companies, its financial results having been unquestionably favourable to the Company.

The Great Northern Railway, a former Chairman told an enquiring shareholder, "ends in a ploughed field four miles north of Doncaster"; i.e. at a junction with another company's line, at that time at all events. Mr. Acworth says that in the case of the London and North-Western Railway the question "what foreign company's carriages, if any, run into Crewe Station?" could only be put to a candidate for honours in Bradshaw; whereas the Great Northern, on the other hand, is a give-and-take line, which is always running parts of its course over the ground of other companies. But the style of its trains is its own, and it has fought its way up to be the representative line of high speeds; "fifty miles an hour comes as natural to the Great Northern as twenty-six miles an hour to the great Continental companies," says Mr. Acworth. His enquiry into the real times of the "race to Scotland," and the truth of the other "records" that were set up against them, we must only refer the reader to. The great point in running fast trains being not to make short bursts, but to keep the pace going regularly, leads the author to a dissertation which ought to be of interest to the general reader, as to the problem of keeping up high speeds from the engine-driver's point of view, and the amount of management that is implied in doing it with the necessary regard to economy. A perusal of these pages will serve to make the reader understand, as Mr. Acworth says, that an engine-driver's business is something more than pulling a handle to turn on steam, and a stoker's something more than shovelling coal on. In regard to high speeds, and the state of the line to be kept for them, the author mentions seeing a district engineer of a great line, walking on the railway, stop to pull up a small weed. "I always teach the men," he said, "to keep the road like a garden path; it may not matter to the running of the trains, but it keeps them up to the mark." That is what modern railway travelling means in this country: everything kept up to the mark.

The comparison between English and French trains is significant. The best French expresses only come up to our second-rate ones. The *train de luxe* from Paris to Marseilles, first class only, travels at a rate of 37.28 miles an hour over all (including stoppages), at twice the charge of the fastest London to Penzance train, and only a mile an hour faster. With such trains as the Great Northern, North-Western, and Midland expresses there is no comparison at all in France. This reminds us to mention Mr. Acworth's story of some French engineers being taken over one of our large lines, and the driver being asked "if he would not like to show these French gentlemen how to go a little?" Replying that he would like very much, he was told to "go ahead," and nine successive quarters of a mile were timed at 80 miles an hour. The impression on the visitors, we are told, was all that could be desired, but their English friends agreed that it was better not to give drivers *carte blanche* as to speed. With present means something like 80 miles an hour appears, however, to be the limit imposed by the conditions under which engines run.

We quite agree with the author in his criticism as to one of the few points in regard to railway working which may be considered in an unsatisfactory and antiquated state, that of fog-signalling. The idea of the signalling under such circumstances being carried on by a man sitting in the fog under the signal post and putting two detonators on the line when he sees the signal arm put at danger (which with a high signal post he might have great difficulty in seeing in a thick fog) and taking them off when the signal arm is dropped, is not in keeping with the elaborate arrangements now made for every other kind of signalling on railways. There must certainly be an automatically

acting fog-signal before long; indeed we expect the time is not far distant when every train will automatically record by signal its own entry on each "block" of a line of railway.

The interest of the subject has carried our remarks to some length, though we have only touched on a few of the interesting points in Mr. Acworth's book, which we cordially commend to the attention of our readers.

## SOME SPECIAL WHITE PAINTS.

BY H. C. STANDAGE.



WHITE lead and "honest linseed" are the foundation materials,—or were twenty years ago,—of the painter's trade. To-day, however, while still holding its own, white lead has to compete with many rivals, and not without cause, because it is a paint that is injurious to the maker, injurious to the user, and offensive to the smell of everyone for some time after freshly laid on. But painters find it so good in body, or covering power, and so easy to work with, and so heavy bulk for bulk, that the universal use of it dies hard. Every one has heard of painters' colic, even if they are not personally acquainted with the disease itself. The painter who is frequently using lead paints imbibes solid particles of paint through the pores of the skin, and in time becomes surfeited with an excess of metallic lead in his constitution, so much so that his blood is poisoned, and, unless the poison is arrested in its action in time, he dies of lead-poisoning. Just as surely will these fatal effects follow the constant dabbling with lead paints as if the painter swallowed a dose of the deadly sugar of lead (which chemically is acetate of lead—lead corroded with vinegar). In the latter case of poisoning the effects are rapid, whereas in the former they are slow, but, nevertheless, sure. It may not seem possible to many persons that the solid mass of white lead should be capable of entering the body through the skin, and not through the mouth, but it does so, and in the following manner:—Lead pigments, mixed with linseed oil, unite therewith and form a chemical compound—linoleate of lead, and this compound is dissolvable in water. It is a lead soap. We have an analogous action in the union of the alkali in soap with the grease and dirt on one's hands when washed. The soap unites with the grease, and forms a froth or scum, which is then readily removed by water. A similar scum is formed when the painter washes his hands, after using the paint-brush, but, as he may have been using the brush for hours before washing his hands, the paint that has smeared his hands has been so long in contact with the pores of the skin so as to have become practically absorbed therein.

Thus a process of slow poisoning goes on day after day, month after month, year after year, until at last the painter's wrist drops—the poisonous blood has so weakened the nerves of the wrist that the painter has no longer sufficient nerve-force to control the necessary muscles for holding the brush—he has got lead palsy; the blood-vessels of his hand have become filled with lead paint sucked in in a similar manner to water by a sponge. In the making of white lead, also, the workman who attends to the making of the stocks runs the risk of poisoning because the fine particles floating in the air enter his nostrils and mouth, and settle in the skin, and so become carried into the system; attempts have been made to obviate this fatality by allowing the corroded lead to fall through a wooden grating into water; but even then personal contact with the pigment cannot be avoided at all times. The colour-grinder also suffers under the same evils, and thus white lead, from its chemical birth to its final resting-place, is a source of dangerous disease.

Painters, therefore, owe a debt of gratitude to those makers who have produced white pigments that fitly replace white lead in all its qualities without its injurious drawbacks. The prime factor in the white paint that should compete successfully as a paint against



white lead is opacity, or covering power. This important quality we have in Griffith's patent white. This pigment is made from zinc, a metal that gives several white salts, but all of them are destitute in body or opacity—that is, the particles are exceedingly fine, and they do not form an unctuous mixture with linseed oil, so that when ground up as paint it fails to hide the colour of the surface on which it is laid unless several coats of the white be applied. The chief whites of zinc are the oxide or carbonate, but as they suffer this disadvantage of want of covering power it would be useless to put them on the market as rivals to white lead, therefore Messrs. Griffith Brothers turned their attention to perfecting the sulphide of zinc. This salt of zinc is usually of a greyish hue, but under Messrs. Griffiths' treatment it is so far perfected as to be little inferior to white lead in whiteness; a slight deficiency in whiteness is an advantage rather than otherwise, because when mixed with staining colours the tone is not so harsh or crude as that produced with perfectly white lead. While thus little inferior to white lead in brilliancy, it far exceeds it in opacity, or covering power, being 30 per cent. denser, weight for weight. Consequently zinc white is economical in many ways: the cost of carriage of 1 cwt. of zinc white is less than that for 1½ cwt. of white lead; the cost of labour is less for laying on 1 cwt. of paint than for 1½ cwt.; the amount of oil required is less than that required with white lead, and the result is not inferior to the best painted white lead surface. Looked at from a sanitary point of view, Griffith's zinc white is satisfactory; sulphide of zinc does not unite with linseed or other oil to form a compound soluble in water, and, therefore, a smear of paint on the hands is not so readily, if at all, imbibed into the blood; and even if it were, it has not the fatal effects of the deadly lead paint. From a decorative point of view, this white paint is also superior to white lead. Ordinary white lead is a carbonate of that metal (sometimes a mixture of carbonate and hydrate of lead), and the chemical union between the components is so feeble that many other chemical bodies will separate them, whence the composition of the white lead is destroyed; thus sulphur in any form, whether it be present as a component of another pigment, whether it be present in the air as an invisible gas, or whether it be in a free state commingled with the particles of some cheap or adulterated paint—this element sulphur will seize on the metallic lead in the white carbonate and form a black compound sulphide of lead. Now, the air of towns is never free from sulphurous fumes, and, as a result, wherever white lead is used as a paint, it will every hour of its exposure be gradually changing in its chemical composition until at last the chemical reaction that has been going on is manifest in the darkened tone of the white paint. The brilliant white tone is now a dirty grey or drab. Whether the white lead be used as a paint alone, or as a foundation for mixing staining colours with, the same reaction silently goes on, with the inevitable result of a change of hue. With Griffith's zinc white, however, no such change occurs, not only because the pigment is already a sulphide of a metal, but because the union of the sulphur of zinc is so intimate that not even a fierce red-hot heat will separate the two. Zinc white is practically not decomposed by heat, and this inseparability of the components of zinc sulphide is not lessened by mixture with other pigments, because the affinity between the zinc and sulphur is very much greater than that of either the zinc or sulphur for any other body brought in contact with this compound: whereas quite the opposite is the case with white lead, because even a weak acid will decompose it, separating one of its components,—the carbonic acid,—and so destroying its quality as a paint. Another advantage of zinc white is that it has no smell, whereas the smell of white lead is very strong, and familiar to every one who enters an apartment that has been painted even so

long as three weeks previous. Until the introduction of Griffith's zinc white, white oxide of zinc was the chief substitute for white lead; but its poorness of body soon caused the demand for it to diminish, until now it is very rarely used, except as a final coat over white lead to protect the latter from the fouling action of gases. Nearly twenty years' use of "zinc white" has gained for it wide recognition amongst builders, decorators, and contractors for all large painting jobs.

Another rival to white lead, and one that was invented to supersede the latter, is Freeman's *Non-poisonous white lead*. On reading the above title the reader will mentally ask, "Why all the previous deprecatory observations on white lead if there is a 'non-poisonous' variety fit for a paint?" But here a few words of explanation are necessary. Freeman's

non-poisonous white lead is in great part a sulphate of lead, a salt of lead that is without smell and without body as a paint, therefore it was neglected as a paint until Messrs. Freeman perfected it and brought it into a fit condition to use as a paint. But, however produced, it could not chemically be made to possess sufficient covering power or opacity alone. On the addition, however, of oxide of zinc,—a white substance that is also destitute of much body and opacity,—the opacity of the lead sulphate was astonishingly increased, so much so that it is not inferior to white lead in that respect. This white lead substitute is "perfectly innocuous, will always retain its colour, is superior in body, colour density, and durability to white lead manufactured by the ordinary methods: it mixes more readily with oil, and is entirely free from the injurious smell of poisonous white lead." Basing their claims for support on these qualities in their product, the makers can confidently assume that they are putting into decorators' and painters' hands a formidable rival to the injurious white carbonate of lead. Independent testimony, however, also speaks highly in favour of Messrs. Freeman's preparation, for it has been proved that the lead sulphate, which forms the basis of the non-poisonous white lead, is practically insoluble, and it is not dissolved by any fluids of the human body; and, moreover, there are no fumes given off from it when used as a paint, like those given off from carbonate of lead. It is also insoluble in water or acids, and, as a consequence of its inertness towards other bodies, Freeman's white lead may be safely mixed with the most delicate stainings without fear of the resulting hue changing at any subsequent time. If brought into the presence of sulphurous fumes there is no darkening of the colour, because if any chemical union takes place between the sulphur and the white lead, the paint would still remain white, because white sulphate, and not black sulphide, of lead would be formed. As, however, the lead component in the sulphate possesses already its full complement of sulphur as a fellow component, and, moreover, as the pigment is not disintegrated by the oil (as in the case of carbonate of lead, whereby carbonic acid gas escapes), there is no metallic lead set free for any adventitious sulphur fumes to seize on; consequently, the stability of colour of this lead white is chemically perfect. As regards sewer-gas, non-poisonous white lead is practically unaffected, whereas ordinary white (carbonate) of lead is soon changed into a black or brown hue. As regards its permanency for outdoor work, it resists the action of the weather better than white lead, because it is not affected by acid vapours nor foul air, and when mixed with oil and dryers it exhibits no tendency to separate from those vehicles when in use, and, as a matter of fact, it requires less oil and dryers in mixing than does ordinary white lead, and since it does not form the chemical compound,—linoleate of lead,—it has no tendency to become translucent, or, in other words, lose its opacity or body, consequently it will restrain the colour of the underneath surface from appearing through it in time, a process which ordinary white lead does admit of. As regards its artistic qualities in combination with other paints, there is no white

to equal it for delicacy of tints; e.g., ordinary white lead in mixture with blues gives very crude tones,—e.g., Prussian blue and flake white, and so likewise with many other colours; zinc oxide gives chalky hues, whereas "non-poisonous white lead" produces the most delicate hues conceivable. This is a very important matter where the decoration of an interior is in process.

The remaining white pigment fit for a paint is *Oxide of zinc*; this pigment possesses many qualities that fit it for use as a paint, it is the whitest of all white pigments, it is perfectly innocuous, and harmless in mixture with other paints and in the presence of foul gases, &c., and for this reason it is frequently used as a final coat over ordinary white lead to preserve that pigment from changing colour. Zinc oxide, however, has serious disadvantages that disqualify it in great measure for general use; it is greatly deficient in body or opacity and is a bad dryer in oil, especially so on a non-porous surface.

The following comparative tests of the foregoing four white paints were made by the writer—amongst many other tests—to ascertain the relative covering power and drying qualities of each. A piece of black polished ebonite was used, so that the oil should not be absorbed, and also, being black, that it should appear through the coat of white paint wherever that was laid on thinly. 1 dram of Freeman's non-poisonous white lead required 1 fluid dram of linseed oil to thin it to the consistency required for working as a paint (this sample of white was already stiffly ground in oil, being taken from a sample tin). The above amount of paint covered exactly 6 × 6 inches, and was laid on as evenly as possible, but even then it did not perfectly hide the black of the ebonite showing through.

Griffith's zinc white was next taken, ½ dram of dry powder required ½ fluid dram of oil, and the mixture covered 6½ × 7½ inches and was very opaque,—in fact, no black whatever could be seen through it.

The third test was with zinc oxide. One scruple of dry powder (as there was not enough surface of the ebonite left for covering with a larger quantity) required 1 fluid drachm of oil, and covered 3 in. by 10 in., and even then was only semi-opaque in parts—that is, it had less body, or covering power, than Griffith's white, as it did not entirely prevent the black of the ebonite appearing.

Lastly, one scruple of dry powder of pure white carbonate of lead required thirty-five fluid grains of oil, and the mixture covered 2½ in. by 7½ in., and exhibited good opacity, like Griffith's white, as it perfectly prevented the black surface of the ebonite being seen.

The above tests were made on Dec. 19, 1888, and the piece of ebonite on which the coats of paint were laid was put out of touch of everything in the writer's laboratory (so that it should have the full effects of all the noxious gases incidental to such a place). A month after the tests were made the paint had not dried. In six weeks, however, each coat, excepting that made with the zinc oxide, was dry; exactly two months after they were all dry, Freeman's white and the white carbonate of lead being hard, Griffith's white being slightly tacky, and so likewise with the zinc oxide; this tackiness, however, was not due to the pigment but to the oil, as that had not entered into combination with the pigment, and as no dryers were added the oil had to dry simply by imbibition of oxygen, a process that extends for at least three months with good linseed oil. As regards the colouration, Freeman's white lead was a dirty white, Griffith's white was a cream-colour, zinc oxide was a milk white, and white lead a light buff. But on close observation, these effects were not due to the pigments but simply to the oil, for on scraping each coat of paint, each showed up white in its natural tone; Freeman's white dried with an enamel-like surface, so did the zinc oxide. Each coat, while the oil was still wet, was touched with a drop of sulphuric, a drop of hydrochloric, and a drop of nitric acid, to test the efficacy of each paint to resist acid moisture. Although the sheet of ebonite was



kept horizontal all the time of drying, these drops of acid spread over the surface in every case excepting with Griffith's white, the spreading being greatest with Freeman's and with zinc oxide, in both cases the white paint being eaten away or dissolved.

From the above comparative tests it will be seen that one-half the weight of Griffith's zinc white covers a greater surface than Freeman's white lead, takes the same amount of oil, and exhibits a greater opacity or covering power; whereas Freeman's white lead dries with more of an enamel and harder surface; that zinc oxide is the whitest in tone of all the four paints, and that white lead is not superior to any of the other whites, but in many respects positively inferior.

The relative covering powers of each paint were as follows, the calculation being worked out from equal weights of each:—

|                             |            |
|-----------------------------|------------|
| Freeman's white lead .....  | 36 sq. in. |
| Griffith's zinc white ..... | 98 "       |
| Oxide of zinc .....         | 90 "       |
| Ordinary white lead .....   | 57 "       |

It should be remembered that the sample of Freeman's paint was already ground in oil, so, weight for weight of dry pigment, the above number of square inches would be greater than 1 dram of dry powder of non-poisonous white lead.

The density is in the following order:—Griffith's white (greatest), ordinary white lead, Freeman's white lead, oxide of zinc; the drying qualities of Freeman's white being the best.

#### NOTES.

THE large and complete plan of the results of the Acropolis excavations in course of preparation by Dr. Kawerau will not be ready for many months. Meanwhile, the general Ephor of Antiquities promises that a provisional plan, embodying the chief topographical discoveries, shall be published in an early number of the *Δελτίον*. It will be eagerly looked for, especially as regards the remarkable discoveries to the south and south-west of the Parthenon. Pending the appearance of this plan, it may be noted that the remains of walls found here have thrown unexpected light on the condition of the south side of the Acropolis during the period between the Persian war and the administration of Pericles. About half-way between the foundations of the earlier Parthenon and the south wall the remains of another wall have been discovered, running nearly parallel between the two. This was the retaining wall of the first terrace erected to support the earlier foundations. The space between it and the foundations is filled in with Persian *debris*. This wall was clearly intended to be provisional, but has never been removed. At the time of its erection the south side of the Acropolis must have presented the appearance of a double terrace. This wall and the foundations appear to belong to the same period. Considerably later it was decided to build the present south wall, and to level up the space between it and the temporary wall to the height of the first terrace. The "Persian" *debris* was exhausted, so the space was filled simply with earth and with such fragments of marble, &c., as were lying about, owing to the architectural works going on. The wall, begun by Cimon, was not finished till the time of Pericles. These particulars are taken from Dr. Dörpfeld's report (dated February, 1889), which has just appeared in the *Antiquarische Anzeiger*. The work at this particular spot was then completed.

THE decision of Mr. Justice Kekewich, in the dispute *The Crown v. The Proprietors of Queen Anne's Mansions*, in regard to the obstruction of light to the Guards' Chapel, though of more general interest than most light and air cases from the subject-matter of the action, contained no new principles. We had again the evidence about the angle of deg. from specialists, and again the same

judicial denunciation of any such hard-and-fast rule. There was some attempt made in the course of the case to prove that there was, though an obstruction, yet sufficient light for a chapel. This argument is also a very old friend which has, over and over again, been proved to be useless, as the owner of the easement has the right to the same amount of enjoyment of the premises as he has been accustomed to for the statutory period. The surprising thing about "light" cases is that the parties cannot come to terms without going to law, for a substantial obstruction of the light must always be evident, and a reasonable compromise should usually be possible. It is also surprising that the owners of servient tenements are not more careful in making sure that the new buildings will not infringe existing rights before the structure is erected.

A LONG letter has appeared in the *Times* from Mr. W. N. White, who has entered the lists against the hon. secretary of the Railway Companies' Association (Mr. Oakley) upon the new classifications of railway rates. Mr. White dates his letter from Covent Garden Market, and, of course, looks at the matter from his own special point of view; but his experience is interesting to traders generally, and gives force to his suggestions. For instance, we are informed that, when engaged in a law-suit with a certain railway company to whom he was paying no less than 500*l.* per week for carriage, he was compelled to send a blank cheque every day for months, as they would deliver nothing until the freight was paid, and he could not otherwise obtain possession of his goods. A still more noticeable statement is made with reference to recent advances in rates, which have, Mr. White says, been considerably modified through the intervention of the Board of Trade under the provisions of the new Act. This is satisfactory, as it goes to show that last year's legislation is proving of value in one direction at least. The Department have, however, an extremely difficult task before them in the settlement of the new maximum charges, and have doubtless been overwhelmed with complaints and conflicting proposals. Arrangements will probably be made, by the way, by which objections relating to Scotch and Irish lines will be dealt with at Edinburgh and Dublin respectively. The letter under consideration travels very much over old ground, but we notice a good suggestion with regard to the classification, which can hardly be objected to by either party to the controversy, and which would in a very simple way dispose of this part of the question. The nature of the classification issued by the Railway Clearing House is now well known, and Mr. White's proposal is that their classification of January, 1888,—that is, the last edition, containing the result of all previous experience up to that date,—should be the one accepted by the Board of Trade in lieu of those just submitted. Most of the complaints with regard to the latter,—as apart from the schedules of mileage rates and terminals,—arise from the fact that they differ from the Railway Clearing House Classification of 1888. This was satisfactory to the Railway Companies, of course, and was generally acquiesced in by their customers, although not entirely free from anomalies. The rates applicable to the different classes would still require to be arranged, and it is almost hopeless to expect that a basis satisfactory to all will be arrived at; but much would be accomplished by the adoption of this plan with regard to the classification, should it meet with that general approval which it appears to deserve.

IT is to be hoped that the public stir which is being made about the National Portrait Gallery, or rather about the non-existence of one, will have some effect on the Government, as men whose word is of weight, such as Sir Henry Layard and Sir John Millais, have put in their protest in so decisive a manner. We have long been promised a

building for the national collection of portraits, but such promises an English Government considers not worth remembering. Imagine such a thing in Paris as a national collection of portraits being left for years in a shed, or sent off to a popular museum in Belleville.

A GREAT number of Exhibition "Congresses" are announced to be held in connexion with the Paris Exhibition, of which a list with the dates has been furnished by the Paris correspondent of the *Times*, which we presume may be taken as correct. From this list it may be convenient to put on record the following dates of such of these Congresses as deal with subjects that are of special interest to our readers:—

|                                           |                 |
|-------------------------------------------|-----------------|
| Congress of Architects—                   | June 17 to 22.  |
| Protection of Works of Art and Monuments— | June 24 to 29.  |
| Chap. Dwellings—                          | June 26 to 28.  |
| Technical Education—                      | July 8 to 12.   |
| Workmen's Clubs—                          | July 11 to 13.  |
| Workmen's Share in Profits—               | July 16 to 26.  |
| Artistic Copyright—                       | July 25 to 31.  |
| Hygiene—                                  | Aug. 4 to 11.   |
| Electricity—                              | Aug. 24 to 31.  |
| Mines and Metallurgy—                     | Sept. 2 to 11.  |
| Building—                                 | Sept. 9 to 14.  |
| Labour Accidents—                         | Sept. 9 to 21.  |
| Applied Mechanics—                        | Sept. 16 to 21. |
| River Utilisation—                        | Sept. 22 to 27. |

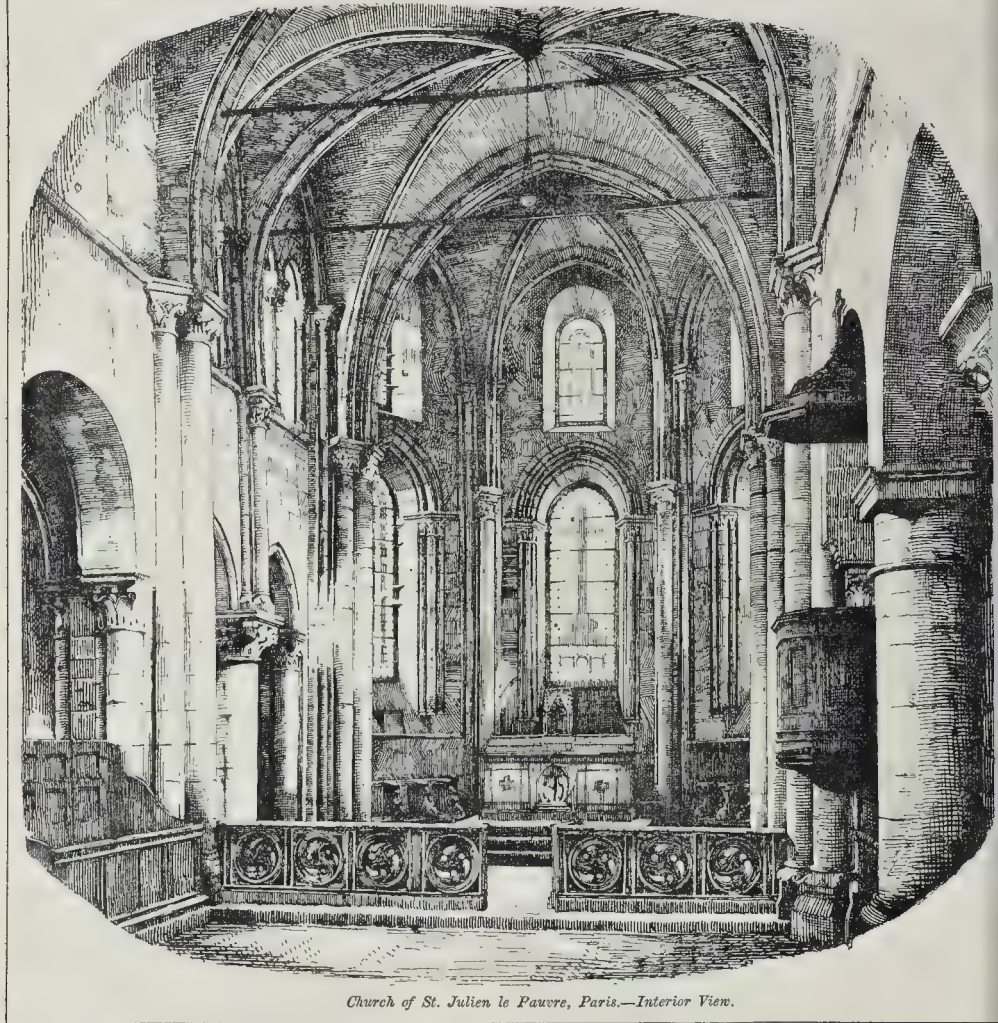
SOME of our readers have, no doubt, noticed with mixed feelings that the nature and properties, present and possible, of the District Surveyors of the Metropolis are being debated in the London County Council. Poetical justice seems to be doing its duty when those who have troubled us come in for a turn under the harrow. Architects, surveyors, builders, and the world at large have grown up with District Surveyors, the income-tax, keen frosts, and north-east winds; but no one has ever professed himself quite delighted with them. The inevitable may be accepted cheerfully, and that is as much as can be expected; there may be some slight solace in the thought that things are not so awkward as they might be, and as they are elsewhere. Might not things be worse, for instance, if District Surveyors were not practising architects, brought up with the rest of us, and accustomed to the difficulties of metropolitan practice? Might not, also, the interests of the public suffer, if only those unable or unwilling to make and keep a practice were entrusted with the task of looking after the safety of life, limb, and property? The Council of the R.I.B.A. reported some years ago in favour of District Surveyors "not being mere servants," considering that they would then be wanting "in that personal authority which has been found of great benefit in obtaining compliance with requirements and the correction of irregularities." We have not noticed as yet any longing for a body of inspectors, acting under the direction of a committee, and debarred from private practice unless *sub roâd*.

THE *Co-operative News* for April 20 has been sent to us, and our attention has been directed to "the Children's Page" of that publication. This page, we notice, is edited by a lady, and we thank her for a well-meant attempt to put in a word for Architecture as a profession, which she does by reprinting from an American periodical (*Harper's "Young People"*) a somewhat "highfalutin" article by "John S. White, LL.D.," entitled "The Six 'Wide-open' Professions." We do not know whether Dr. White is an authority on the condition of the architectural profession in America, but he writes:—

"Nearly all the professions and most lines of business are so overcrowded to-day that the young man who has reached that point where he must choose his life-work stands dazed and halting, unless somebody's empty shoes are ready for his feet. Possibly I may help with a few bits of advice, for there appear to me to be half-a-dozen professions which are calling in ringing tones for men to enter. These are architecture, railroading,\* elec-

\* We are not well-enough versed in American terminology to know whether "railroading" means railway engineering or railway management. Perhaps both.—Ed.





*Church of St. Julien le Pauvre, Paris.—Interior View.*

trical engineering, politics, the ministry, and secondary education. To the boy who possesses a patient and independent spirit, a taste for drawing, a correct eye for proportions (*sic*), and a spice of originality, the grand profession of the architect now presents the most enviable opportunities in varied fields."

Dr. White then goes on to show that millionaires are accumulating in America, and he is sanguine enough to think that the fortunes acquired by pork-packing or by dealing in dry goods will be largely spent in the erection of buildings worthy to be called works of architecture. We trust, for the sake of our architectural cousins in America, that these optimistic views may be fully realised. But inasmuch as Dr. White speaks of architecture as a "wide-open" profession,—one, moreover, which is "calling in ringing tones for men to enter,"—and as the editress of the "Children's Page" in the *Co-operative News* commends the Doctor's views as likely to be "of use to English boys," we think it worth while to point out that in this country, at any rate, the profession of architecture is certainly not undermined at present; indeed, things are very much the other way, and complaints of the "overcrowded" state of the profession increase yearly, despite the corrective administered by the obligatory Examination of the Royal Institute of British Architects. At the same

time, we sincerely trust, with Dr. White, that "increasing wealth, taste, and opportunities" are going "to make the architect's profession one in which triumphs may be gained far superior to laurels that can be won on the field of battle," though the sentiment is more to be commended for the excellence of its tone than for the felicity of the language in which it is clothed.

THE committee in charge of the arrangements for the proposed Naval and Military Exhibition in Edinburgh have met with satisfactory encouragement, both as regards guarantee and number of promised exhibits. The Exhibition is to be divided into eight sections: the first embracing paintings in oil and water colour, sculpture, engravings, etchings, photographs, &c., of individuals and of scenes connected with naval and military history. The second embraces arms and armour of all periods, and of all nationalities. Section third is devoted to standards, colours, flags, of all branches of the United Service. The fourth section will consist of medals and orders, and commemorative decorations, naval and military. The fifth comprises military books, music, and musical instruments. Section sixth embraces autograph despatches, commissions, letters, and other documents of naval and military interest. The seventh section embraces naval

and military art, including the systems in force at various periods, executed for professional purposes by naval and military officers. The eighth section will consist of relics or memorials not included in any of the previous sections. Should the exhibition prove a financial success the surplus funds are to be applied in aid of naval and military benevolent and charitable institutions. The date of opening is not yet fixed.

MR. AUBERON HERBERT'S long letters to the *Times* as to the state of the New Forest deal with a subject that deserves attention. The New Forest is the last important relic we have (or had) in England of the uncleared forest country, and Mr. Herbert,—who has the good fortune to inhabit that beautiful country,—complains that the character of the Forest is being spoiled by unnecessary enclosures, by plantations of ornamental trees out of keeping with the Forest scenery, and that people are allowed to cut away underwood and to "skin the Forest," as he expresses it, for the consideration of some small fees not worth anything in return for the damage done to the appearance of the Forest scenery. In regard to new work done under official inspiration, he says:—

"We have lately had an expensive system of planting trees of a non-indigenous kind. Money





Pier in the Church of St. Julien le Pauvre, Paris.

has been thrown away in dotting certain parts of the forest with scarlet oaks, limes, sycamores, and, in the instance at least, cedars. Fortunately, the experiment does not seem to have answered, the rate of mortality has been even higher than it usually is among other Government *protégés*. I say "very fortunately," for it is a crime to change the character of the forest growth. It shows a complete want of appreciation of what the forest is. A few fragments of old woods are almost the one bit left to us of an earlier England,—the England of the greenwood time,—and whatever tricks or experiments you choose to play with the modern plantations of the forest, these old fragments and the open spaces about them should be placed entirely out of the reach of the man of taste. Let "taste" rule in park, garden, and plantation if it will; but let the open spaces and the few thousand acres that are now left of the older and oldest woods, be treated as a sanctuary in which it obtains no entrance. Moreover, it is to be observed that these young trees have a strangely infelicitous knack of getting planted in the wrong place. Some gap in the woodland is seen, which it becomes at once the mistaken object of the man with a bundle of seedlings under his arm to fill up. Thus the natural beauty of alternating wood and open space is lost; while the hand of taste writes itself in unmistakable and permanent characters by the regular distances from each other at which these young parvenus and intruders are planted."

to which protest we entirely concur, and hope it will not have been made in vain.

WE hear that the Duke of Portland has bought the leasehold house of Sir John William Kelk, Bart., being No. 3, Grosvenor-square, which, we believe, was built by the late Sir John Kelk, Bart., the contractor, for his own occupation. The late Duke of Port-

land's town mansion was Harcourt House, in Cavendish-square, since occupied by the Marquis of Breadalbane. That house, originally erected for Robert Benson, Lord Bingley, in 1722-3, was bought at his death, in 1731, by Simon, second Viscount and first Earl Harcourt, who sold it to William, second Duke of Portland, by whose marriage (in 1734, at St. Peter's, Vere-street) with Lady Margaret Cavendish Harley—sung by Prior as his "noble, lovely, little Peggy"—only child and heir to Edward, second Earl of Oxford and Mortimer, the Marylebone Estate passed to the Bentincks. At the British Museum is preserved a copy of the original design, "as it was drawn by Mr. [?] Thomas Archer, but built and altered to what it now is by Edward Wilcox, Esq." Though the house has not retained all the somewhat forbidding features which are commented upon in the "New Critical Review of the Public Buildings in London" (1736), when it had no neighbours in the old Oxford-square other than the two wings\* of the large building designed, by John Price, in 1720, for the Duke of Chandos, its front wall, courtyard, and *porte-cochère*, and general air of seclusion, have given to it an unusual aspect, less common in London than in the older aristocratic "quarter" of Paris. We may here mention that amongst some houses which have just been demolished along the western side of Holles-street, leading southwards out of Cavendish-square, is No. 16, *olim* 24,

\* These two wings, of which the eastern one remains, by the corner of Chandos-street, are attributed to Shepherd.

wherein Lord Byron was born, and whence he was carried to be christened in what was then the parish church, and is now known as the parish chapel, High-street, Marylebone.

A NEW chime of bells, by Messrs. Harrington & Co., of Coventry, has been placed in the belfry of St. Giles's Cathedral, Edinburgh. The chime consists of thirteen tubular bells, including an octave in C, two notes above and one below the octave, and F sharp and B flat. The range permits of a number of tunes, and the new bells are admired in regard to tone, but we are by no means in favour of this class of bell, far inferior in tone to the orthodox bell, though it may do for bells that are only required to be used in chiming, and we are not surprised to learn that this peal is not sufficiently powerful to be heard at a distance of more than a quarter-of-a-mile.

PRELIMINARY arrangements are in progress for the formation of a new theatre in Edinburgh, to be conducted on the lines of the London "Empire" and "Alhambra" theatres. A site has been secured within a stone's-throw of the Theatre Royal, which is now occupied by what was once a dissenting meeting-house called the Tabernacle, and now in use as a furniture warehouse. The new theatre is to be fireproof, and is to afford accommodation for 3,000 persons. It is to be illuminated with the electric light, and to be complete in equipment in other respects. Mr. Frank Matcham is to be the architect.

WE join our strong protest to others which have already been made in various quarters, against the absurdity which has been commenced at the National Gallery of removing the names by which great painters have become famous, but which were not their family names, to substitute these latter names, known only to students. To add the real name in brackets would be quite right, but to expect that the world which has known Claude and Gaspar Poussin and Tintoretto by those names for two or three centuries is going to re-name them now, is a ridiculous and futile piece of pedantry. Who is responsible for it?

#### ST. JULIEN LE PAUVRE, PARIS.

We give two illustrations of this remarkable church, to the threatened fate of which we have recently referred. It is the most ancient among the chapels and oratories comprised within the city boundary of Philippe Auguste and Charles V., and the most interesting in its architecture, which presents many analogies with that of Notre Dame.

After having suffered from the devastations of the Norman plunderers, the church became in the twelfth-century the property of a religious community which rebuilt it. It was here that from the thirteenth to the sixteenth centuries the general assemblies of the University were held as well as the elections of the Recteurs of Paris. It is also a tradition that Dante worshipped in this church during his stay in Paris.

The church derives its name from St. Julien the Martyr according to some authorities, or St. Julien the Confessor, bishop of Mans, according to others, and consists of a nave and aisles separated by piers, many of them curious in detail: of one of them an illustration is subjoined. The figures which decorate the capital are almost identical in design with the decoration of a capital on the south side of Notre Dame.

Unfortunately in 1675 the ancient portal was destroyed to give place to an insignificant looking façade with Doric pilasters. The lateral façades have for the most part preserved their original character. The chevet has massive external buttresses with a modillion cornice over them. The church has four bays only internally, with piers alternately of single columns and grouped piers. The general interior effect, in spite of the small size of the building, is very noble and striking.

The stalls of the choir are still intact, but the altars have been defaced and the statues removed or injured. Among the curious details of sculpture still left is a bas-relief representing a body rising from the tomb. The armorial bearings at the angles of the tomb, as well



as a long inscription, record it as in memory "d'honorable homme et sage maître Henri Rousseau, Seigneur de Chaillet et de Confians, avocat au parlement, qui trépassa en 1445 et donna 100 francs pour avoir sa sepulture dans le chapelle de l'Hôtel Dieu."

This was, in fact, the special function of the church until 1793, when the "Terror" closed the doors of all the churches in Paris. It was re-opened for service in 1826, and became the chapel of the old hospital until the latter was transferred to the new buildings in the close of Notre Dame, a few years ago. To-day this ancient church is totally abandoned, and is scheduled among the buildings that are to be pulled down. Sometimes an archaeological visitor finds his way along the narrow winding streets in the vicinity to see it; but unless some one will take up the defence of one of the most curious and interesting buildings of old Paris, its days will probably be few. It might very well be made into a kind of historical museum as an annex to the Carnavalet.

The Société des Amis des Monuments Parisiens, presided over by M. Garnier, has endeavoured to enlighten the Paris Municipality in regard to the value of this monument, and is endeavouring in the meantime to keep it from further decay.

#### PROGRESS OF THE NEW LOCH KATRINE WATERWORKS.

The calculations of the Corporation engineers, brought to a practical bearing a short time ago, indicate the approximate space required for completing the tunnelling operations now going on, whereby Glasgow is to be equipped with a second or duplicate water-conduit from Loch Katrine (see *Builder*, February 18th, 1888). Possibly under an exceptionally fortunate train of attendant circumstances the great boring may be accomplished some short distance of time within the limit; but on a fairly generous yet by no means extravagant estimate, three years from the spring of 1889 has been recognised as the earliest likely date of completion. The subterranean cutting is not continuous, but, owing to the configuration of the country traversed, falls into four main sections, according as it is necessary to pierce through the more or less elevated ridges and mountain spurs of Perthshire and Stirlingshire which separate the loch from the Kelvin watershed, on the northern flank of which, eight miles from Glasgow, the tunnelling terminates. As the city is served from this point by gravitation the bore has all the way to maintain a level approximating to that of the parent loch, and the downward gradient is therefore sufficient only to induce the requisite celerity of flow. Four valleys of inferior levels intervene at pretty regular intervals, and these depressions are all passed, partly on the siphoning principle in closed metal piping, and partly by carrying the channel on piers.

Leaving the loch, tunnelling begins at once by a cut nearly 1½ miles long, freeing the work from the loftier ridges enclosing the natural mountain basin. This portion is about to be attacked. The Duchray tunnel follows after an interval, and then the Kelly, the contract comprising the latter by this time showing a very satisfactory commencement. Most progress has been made with the Mugdock tunnel, the section which lies nearest to Glasgow, and brings the aqueduct out upon the Kelvin watershed and into immediate touch with the great artificial service reservoirs, Mugdock and Craigmaddie, the former in use since 1859, and the latter now under process of construction. Of this tunnel there remains uncut little more than 400 yards, the total length being over 1½ miles. Unfortunately, of late, there arose a difficulty in maintaining due ventilation within the boring works from the northern mouth, and it became desirable, if not imperative, to cease operations there, the drilling thenceforward being confined to the southern face from Mugdock, where there has arisen no serious cause of complaint on that or any other score.

To the engineers of the Corporation, the construction of the second service reservoir, much smaller though it is, as reckoned on the financial consideration, has been fraught with by far the greater load of anxiety. Ever since the start a few years ago, and until recently, the progress attained has been but of the laggard kind. Engineering difficulties have not been wanting,

but the first allocation of the contract was not a fortunate one, and hence sprang the greater portion of the vexatious tardiness so long characteristic of the operation. Ultimately the contract had to undergo a very radical rearrangement, the outcome being that it fell into the hands of a new firm, and since that change was effected the progress made manifest has been on the whole satisfactory to the controlling engineers. The making of the huge embankment works (the heaviest of the sort in the country) is proving a very arduous undertaking, and even on the most sanguine estimate the new reservoir, which is contiguous to the old, and is to be known as the "Craigmaddie," cannot be ready for service for yet a year or two to come. Raising the level of Loch Katrine by a few additional feet, and the laying down of an increased number of supply-pipes between the reservoirs and the city, form the remaining portions of the work necessitated by Glasgow's bold scheme of extension. Only a very small proportion of these terminal sections has as yet been entered upon. It is now fully recognised that the works for a wholesale enlargement of the Loch Katrine possibilities of supply have not been taken in hand one moment too soon. The city, and surrounding water district with which it is conjoined, have much more than overtaken the margin of inflow and storage deemed in 1856 abundantly sufficient over a stretch of the future at that time hardly regarded as measurable, and should the approaching summer prove a dry one, the population even thus early will be put to rather severe straits.

#### QUEEN ANNE'S MANSIONS AND THE GUARDS' CHAPEL.

This case of dispute as to right of light (The Attorney-General v. The Queen Anne and Gardens and Mansions Company and Others), which has not yet reached its final stage, is of so much interest and importance that we think it well to place upon record in our columns the main substance of Mr. Justice Kekewich's judgment delivered last week, as reported in the *Times* of the 18th. The action was to restrain the defendants from carrying their new additions to Queen Anne's Mansions to the proposed height (130 ft. to 140 ft.), which it was claimed would seriously interfere with the light of the chapel. As our readers are aware, the chapel has been in recent times sumptuously decorated internally with mosaics, bas-reliefs, carving, and memorial windows, and internally may claim to be, as the Attorney-General said, a beautiful work of art, whatever may be thought of its exterior. The learned Judge, in delivering judgment, said:—

"Before dealing with those questions which on the evidence and arguments deserve separate consideration, it is convenient to mention some small points with which they ought not to be encumbered. It has been said that the chimneys proposed to be erected on the defendants' buildings will obstruct the access of light. I have known cases in which chimneys and other obstructions either enjoy or the side of buildings have been important, but that is not so here. If the buildings would not otherwise offend against a reasonable rule, the chimneys will not create such an offence as to justify an injunction or a verdict for more than nominal damages. On the other hand, much has been attempted to be made of the small amount of light at present coming to the chapel. I do not suppose it was intended to be argued that any abstraction was therefore immaterial, for, as was said by one witness, 'the less you have the less you can spare,' but it certainly was suggested, as I have often heard suggested before, that the owner of the dominant tenement, having by his own act deprived himself of light, formerly enjoyed, is not entitled to complain of the abstraction of part of the light remaining. In this connexion special reference was made to the wire guards and bars of the windows, which I take to be no larger than reasonably required, the pillars dividing the windows internally, and the arches which separate the nave from the aisles on either side. I fail to understand any such argument. It seems to me little short of absurd to say that because, wisely or unwisely, a man has reduced the light coming to his building to the least he considers convenient, and perhaps to a point beyond what others might consider convenient, he is, therefore, less entitled to claim what he prizes, or is in any way debarred from complaining of obstruction. It seems to me a conclusion would be at variance with the absolute and indefeasible right which is recognised in many cases, and particularly in 'Tapping v. Jones' (11 'H. L. C.' 290). These small matters disposed of, I approach the one point of novelty which distinguishes this case from others on the same

subject. The building sought to be protected is a chapel, not commercial, but as unlikely to be diverted from its present use that the possibility may be left out of consideration. It is not denied that the principles by which the Court has been guided in the protection of access of light to buildings used for domestic or commercial purposes are applicable to one used for ecclesiastical purposes, but that masters of interference with the comfort of worshippers is liable to be considered as much as that with the comfort more often spoken of in this class of cases. If, in other words, the evidence, properly considered, leads to the conclusion that there will be an obstruction of light sufficient to restrict the limits of time within which persons attending Divine service can read their books without the aid of artificial light, it is not denied that such obstruction ought to be prohibited. And, although little attention was paid to it during the argument, I suppose that the same admission would be made respecting the use of the chapel for those educational purposes to which it is sometimes applied. But it is said that it does not follow from this, and that cannot be held, that the stained-glass windows and the mosaics and carvings are on the like or any principle entitled to protection. The defendants, of course, contend that their proposed buildings will not, in fact, prejudicially affect the windows or walls; but the argument must go so far as saying, and I understand it to be distinctly said, that these windows and walls may be prejudicially affected without incurring liability to injunction. A picture gallery in a private house is undoubtedly entitled to protection, as also a picture gallery in a public building appropriated to that purpose, but I understand the defendants to say that this is because such picture galleries, though not made or maintained with a new value, are capable of being regarded as a money value, and, when found in private houses, may be treated as reasonable accessories to the comforts of such houses. It is not suggested that the decorations of this chapel, though costly, have a money value, and their title to protection must depend and be based on a more general principle. This is not the place for discussion whether or to what extent buildings appropriated to ecclesiastical purposes may properly be made the home of works of art of a religious or secular character. This chapel is a peculiar one. It is intended, and used for the Brigade of Guards, and, if those who have died in the service of their country ought to be commemorated at all, where can that better be done than in the chapel where their surviving comrades are taught their highest duties? And, if these commemorative pictures are allowable, why should they not be conceived and executed in the most artistic style, and exhibited for the admiration of the public as well as the soldiery? And if they are to be seen and admired, why should not a sufficient access of light be preserved so that this may be done to a valuable extent? I am unable to conceive any reasonable answer to these questions which would assist the defendants' case. There is no exception from the Prescription Act (2 & 3 William IV., cap. 71, sec. 3), any more than there was from the common law, of any class of building from the protection afforded by law to the access of light. Buildings are divided by the statute into dwelling-houses, that is, those used for domestic purposes, workshops, those used for commercial purposes, and other buildings, and I see nothing to restrict the generality of the third class. A question may occur again, as it did in the recent case of 'Harrie v. De Pinner' (The *Times* Law Reports, vol. 2, p. 529, 53 Ch. D., 1888), whether a given object is a building within the Act, but no question of that kind was suggested here; and, the statute being applicable, the access of light must be protected as much as in the case of a domestic or commercial building, provided, of course, that the title by prescription has been made out, and that the claim falls within the principles by which the Court has been guided in giving relief. I am not sure that Mr. Rigby (Counsel for defendants) intended to press his argument to the conclusion, though it certainly pointed in that direction, that one of these principles is that a plaintiff cannot protect light required for a special purpose unless there has been a use of the light for that purpose during the prescriptive period. There is no authority for any such proposition. It is reasonable to hold, and it has been held, that light cannot be protected for a special purpose unless it has been used for that or a like purpose, or there is a reasonable probability of its being hereafter applied to such purpose. That I understand to be the rule laid down in 'Moore v. Hall' (3 Q. B. D., 178) which, having regard to the way in which the question was raised, and the Court by which it was decided, must be considered a case of weighty authority, and I certainly deem it conformable to the judgments of Vice-Chancellor Wood in 'Dent v. The Auction Mart Company' (L. R., 2 Eq., 238), and Sir George Jessel in 'Aynsley v. The Auction Mart Company' (L. R., 8 Eq., 544), as well as other decisions. The defendants' argument made it necessary thus far to deal with the question of probable user, but the point need not further be pursued, inasmuch as here there has been for at least ten years a distinct user of the light coming to this chapel for the purpose of illuminating



the windows and walls. Assuming then that the defendants are liable to an injunction if the Court is satisfied that their proposed buildings will obstruct the access of light to this chapel so as to materially interfere with the comfort of worshippers, or the proper illumination of the works of art, I have to consider whether this is proved to be, alleged, the necessary consequence of those proposed buildings. There are two general observations to be made on the evidence, applicable to the question on either side. The expert evidence was, to my mind, overdone. I see no possible advantage in calling so many witnesses to give professional opinions on the diminution of light or its consequences; and the admeasurements of one competent man, or say two at most, are all that can, in any event, be necessary. On the other hand, I was surprised at not having greater assistance respecting the value of diffused light in connection with such buildings as this chapel, and, in speaking of diffused light, I point especially to its influence inside the chapel when springing from direct rays in the windows or otherwise. The influence of light on colour seems to me to deserve more consideration in this case than it has hitherto received. On either side, and this view has done much in regulation of the evidence, a point of some importance to the parties which will presently mention. Again, I think that the evidence on this side is defective in resting overmuch on a line defined by a stated angle up to which obstruction may safely go, or which cannot be safely exceeded. The defendants' witnesses were most in default, for they calculated the angle of 45 deg., which is rejected by the Court as a conclusion, and said some of them did not venture to state that as their own opinion, but were content to take it as laid down by a large number of their professional brethren. I have never seen a case in which it was necessary to examine the facts independently of preconceived notions, or where expert evidence, based on arbitrary rules, was of less real weight. Mr. Chadwick and Mr. Currey, whom I take as fair representatives of the defendants' witnesses, both admitted that the buildings proposed to be constructed would shut out a certain amount of light, and they estimated at 10 per cent. of that formerly coming to the chapel, or eight degrees. It is calculated with reference to the centre window, and is an average of the obstruction to all windows. It follows that, as some of the windows are said to be but slightly affected, some must be largely to make up the average, and this was admitted. It was, however, contended that 10 per cent. of the full light enjoyed by windows practically constructed is not a material quantity so as to make the loss of a substantial injury to the chapel. That, as an abstract proposition, seems to me a strong one, but it must be considered with reference to the particular circumstances. Before mentioning those circumstances, I will say a few words about the three parts into which the defendants' buildings have, for the sake of defence and argument, been divided. The eastern tower, standing alone, is to be free from objection. It can only obstruct lateral light, and its distance from the chapel is such as to make it doubtful whether such obstruction would be sensible. The defendants' witnesses valued it at 2 per cent. of the full light, and I do not remember any correction of its estimate. But the eastern tower does not stand alone, and I think it would be unsafe to regard it as less than a part of the entire building, consisting, in addition, of the central block and western tower. Each of these parts the estimate of 70 per cent. is applicable, and I cannot but think that the estimate is somewhat low. Certainly it is as regards the two western windows, which, it seems to me, are not substantially affected by the western tower, but if no other window is practically affected by any other part of the building at all. I do not think that, as regards Divine service or educational uses, the chapel will be so largely affected as has been anticipated, but there can be no doubt that on days when artificial light will be required on some days when now it can be dispensed with. I think, however, that there will be some increased difficulty in reading on the north side of the chapel. Under these circumstances, and remembering that the chapel is, as agreed on all hands, insufficiently lighted for these purposes already, I think that the Court would be justified in granting an injunction against the proposed obstruction. It is not a case in which the injury could be remedied by damages. The serious injury, however, is that to the stained-glass windows and mosaics. It is said, and Mr. Seddon must be accepted as an authority on the point, that direct sunlight is not required for stained-glass windows, and, indeed, he and others who will be heard, seem to say that the direct rays are only to be avoided, and that their opinion is only in line with that part of the window on which the sun falls, and not with the rest of that particular window or with any other windows the illumination of which may or may not be enhanced by the access of this ray in the chapel. I am not satisfied that the direct light would always be a disadvantage even to the windows, but it will not further all on this point. The mosaic on the wall at the altar deserves separate consideration, and I think form

the most important feature of this part of the case. With reference to this, the chapel is "arranged in a low key of colour," and there is a concurrence of testimony to the conclusion that this was intentional on the part of the architect, and that, while not intending the chapel to be better lighted than it now is, he did not contemplate any diminution of light. To take away even a small proportion of the light now enjoyed by the chapel would be not only to interfere with the artist's conception, but to spoil the effect which he intended to produce, and has produced. In my opinion, the quantity of light proposed to be obstructed cannot, from this point of view, be regarded as a small proportion, and I think that the obstruction will substantially alter the character of the chapel in rendering less visible and less admirable what can now be seen and admired. It is said that these mural decorations can be well seen by gas-light. Perhaps so, and perhaps climatic and other disadvantages make it necessary that they shall often be seen by that light, if at all; but that, in my judgment, is no reason why the light of day coming to them should be obscured. There is one further point made by the defendants, on the evidence, requiring to be noticed. It was suggested by or to others, and admitted by Mr. Blomfield, whom Mr. Seddon supported, that the northern light is the best for these mural decorations, because that light is not direct, but diffused, and therefore more steady, and on this was based an argument that an obstruction to the direct rays, coming through the southern windows, will be an improvement to the chapel in reducing the light thus derived to the level of that coming from the north. There is to misconstrue the admission, in which he observed, other witnesses did not concur. Mr. Blomfield was careful to insist on the necessity of a strong light to exhibit the beauties of this chapel, and, though he stated a decided preference for a northern light, I do not find him saying, and it would be strange if he had said, that the southern light is bad because the northern is better. I cannot but think that this attempt to minimise the value of the southern windows by comparison with the northern ignores the obvious fact that the illumination of either wall must largely depend on the windows opposite to it, and it must not be forgotten that, according to the evidence, the rays of the sun passing through the southern windows will not reach the base of the northern wall, which will therefore be illuminated by them without the disadvantage, if disadvantage it be, of their falling upon it. This is a convenient place for mentioning that, as regards Mr. Blomfield and other witnesses who dealt with the effect of light on the interior of the chapel, I have given no weight to any alleged diminution of light to what was called the apse, that is, so much of the chapel as lies east of the chancel screen. I am not sure that any part of it must be materially affected by the proposed buildings, and I am sure that the fresco above the chancel arch would not be. The evidence proves that it can now be seen only by the aid of light which could not be obstructed—that is, late afternoon light coming through the western door, and I do not think that what will be cut off by the western tower need be taken into consideration. A word must be added respecting an effect alleged to be produced by the building as at present existing on the south windows or some of them. It is said that the wall or the scaffolding so obscures a lower portion of at least one window as to divide the window into two parts—one darkened and the other not, and thus to produce an unsightly result. As against this it is said not only that it is not and cannot be the effect of the present erection, but that the opaqueness of the glass renders it even impossible. That I doubt, but I cannot, on the evidence, hold that any such result as is alleged has been produced hitherto, nor is there evidence to satisfy me that it will be produced in future. There is no occasion for one to refer more than I have already done to any of the cases cited during the argument or any other cases. There was at one time, and not so very long ago, some doubt respecting the principles guiding the Court in arriving at a conclusion whether an admitted or proved obstruction to light is material or substantial, and whether the proper remedy is injunction or damages. I am far from saying that the application of these principles to new circumstances or old circumstances appearing in new combinations may not give rise to many difficulties, and of course I do not say that the principles themselves may not be amplified or modified. But if I am right so far, and the obstruction of access to light to these windows is of the character and extent which I have held it to be, there can be no doubt but that, according to the principles of "Aynsley v. Glover" and other cases, the injury to the chapel is material or substantial, or, in other words, so serious, that if this were an action for damages the jury would be directed to award a large sum; and, if being an action for an injunction, that relief must be granted. The latter view of the case is confirmed by the fact, for fact it certainly is, that no damages would be adequate compensation for injury to the decorations of this chapel. An appeal was made to me by the Attorney-General in opening the case, and by Mr. Riggby at a later stage, to say, if I could, precisely in what manner and to

what extent the defendant's proposed buildings would, if completed, be offensive, or, in other words, to define the line of obstruction up to which the defendants may safely go, but which they cannot safely transgress. It was mainly in order to consider this point that I reserved judgment until to-day, and it is not without regret that I find myself unable to accede to so reasonable a request. On full consideration of the evidence, and reflection on the comments on it, I am, as I was at the close of the trial, unable to say with any precision how far the defendants' buildings ought to be reduced in height or breadth in order to avoid that injury to the chapel which would properly be considered substantial. It was to this I referred when mentioning just now the want of more complete evidence as to the influence of light on colour. I do not say a word to place an obstacle in the way of the limit of tolerance, but I am not sure that any concession beyond that would not also be beyond what can be safely granted. I am aware that the limit of tolerance has been fixed by an arbitrary rule, corresponding to a line far short of that on which the majority of architects insist; but, on the other hand, I am sure that the reasonable liberty of the defendants cannot, as their defence against the rights of the plaintiff, be limited by any calculation of angles. All the circumstances must be taken into consideration, and these, I think, include some not covered by the evidence adduced before me. One suggestion, however, I can venture to make. It was hinted at by Mr. Riggby during his argument, and I know from experience that it has often proved valuable. It is to make some difficulty in adopting it in the present case, but, having regard to the large interests involved, I fancy that such difficulty will not prove insuperable, and I need not ask the Attorney-General to render any assistance in his power. I think that if there were a temporary erection following the outline of the proposed buildings, and, observations having been made on the effect of that temporary erection on the access of light to the windows, it were modified, and, if need be, again and again modified so as to allow repeated and corrected observations, it might, and probably would, be possible to arrive at a conclusion what is the fairly allowable limit of obstruction of light coming to the chapel. In the meantime I must direct an injunction in general terms. It will be to restrain the defendants, &c., from erecting their proposed buildings on the south side of the chapel, according to the model, or otherwise so as to interfere with the access of light to the six windows in the southern wall of the chapel.

#### AMERICAN VILLA ARCHITECTURE.

THESE are illustrations of several examples of what may be termed the picturesque "villa" style of residence which American architects of late years have treated with great success for small houses in rural or seaside neighbourhoods.

The first two are interiors of parlour and hall in a residence at Manchester-by-Sea, Massachusetts. The idea was that of an old farm-house of the district transformed into a dwelling-house. The parlour, which was an afterthought, is left with the shape of the roof showing within: the room is about 30 ft. long. The walls are panelled with white wood stained very dark, but the chimney-pieces in both parlour and hall are left white. The decoration at the end of the parlour is drawn in white plaster and coloured. The contract price of the house was 6,000 dollars: the parlour added another 1,000. The architect is Mr. Arthur Little.

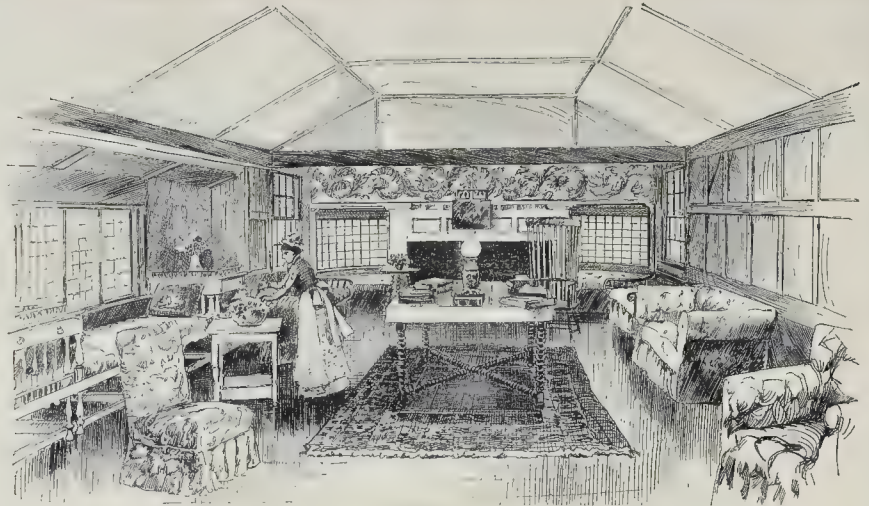
The residence at Narragansett Pier, R.I., is a sea-side cottage, admirably treated for the situation; simple and yet solid-looking. The architect is Mr. Bruce Price.

The next two illustrations represent two views of a residence in Far Rockaway, L.I., partly of brick walls and partly of timber: designed by Messrs. McKim, Mead & White, of New York.

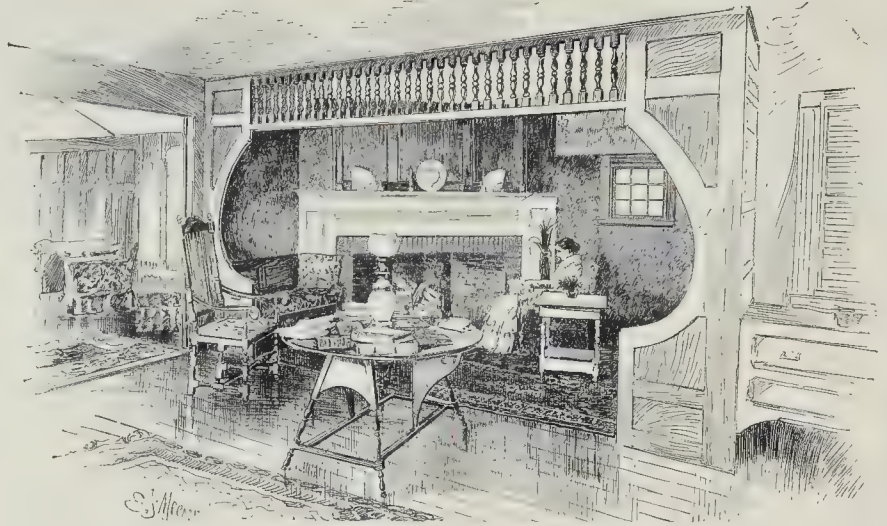
The Club House at Glen Ridge, N.J., is built of wood covered with shingles. All the rooms are finished internally with hard wood, and the billiard-room is wainscotted to a height of 8 ft., and covered with barrel-vaulted ceiling. The cost of the building was 8,000 dollars. The architect is Mr. W. Conners Hazlett, of New York.

**New "Savage Club" House.**—Messrs. C. J. Phipps, F.S.A., and W. J. Ebbetts, architects, are engaged to make various alterations at Nos. 6 and 7, Adelphi-terrace, and to change the two houses into a new club-house for the Savage Club. The members will thus return to very near their original quarters by the Caledonian Hotel, Adelphi, and at Midsummer next will vacate their present rooms in Lancaster Mansion, Savoy-place, in the Savoy.





PARLOUR



HALL.

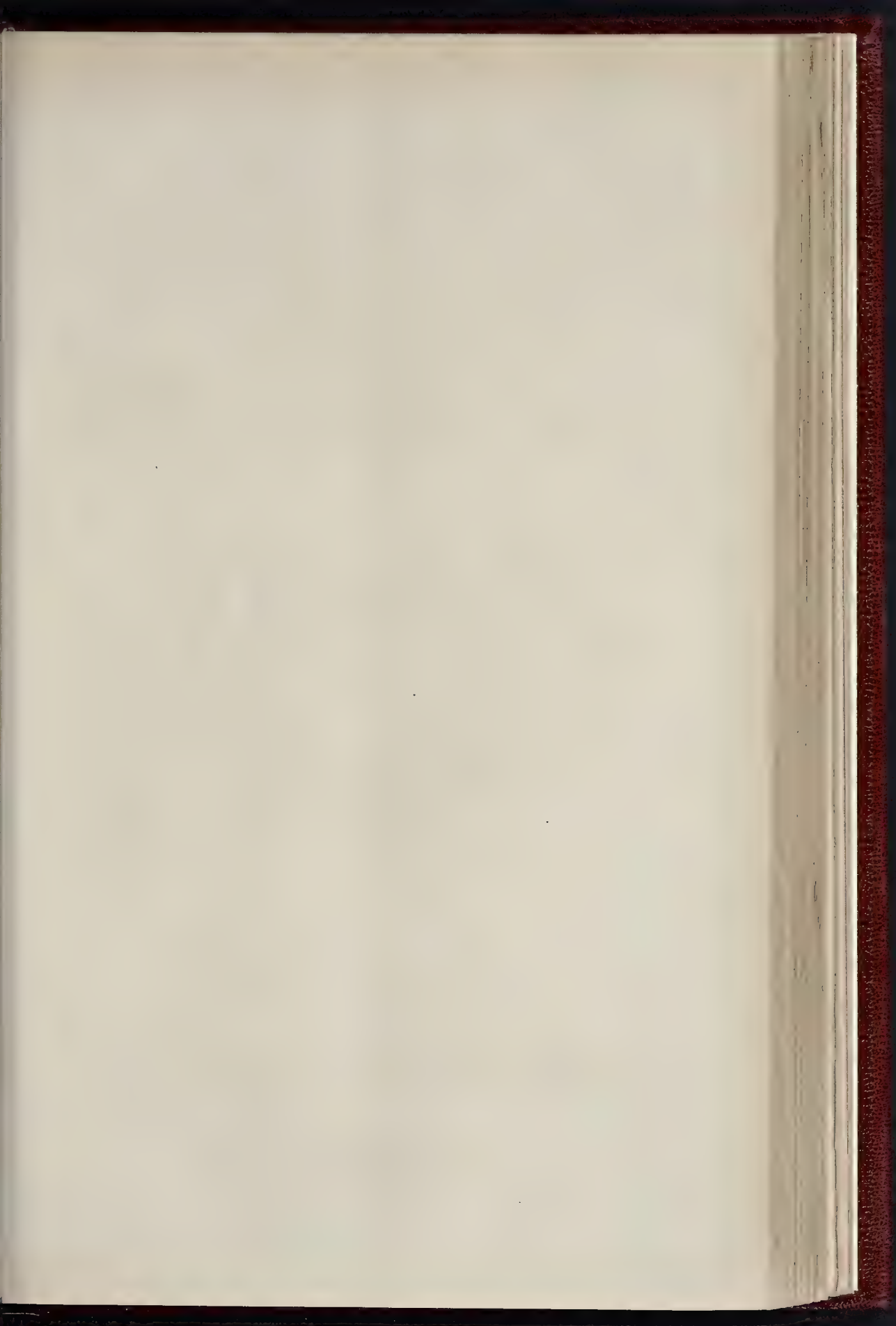
*Residence, Manchester-by-Sea.—Mr. Arthur Little, Architect.*



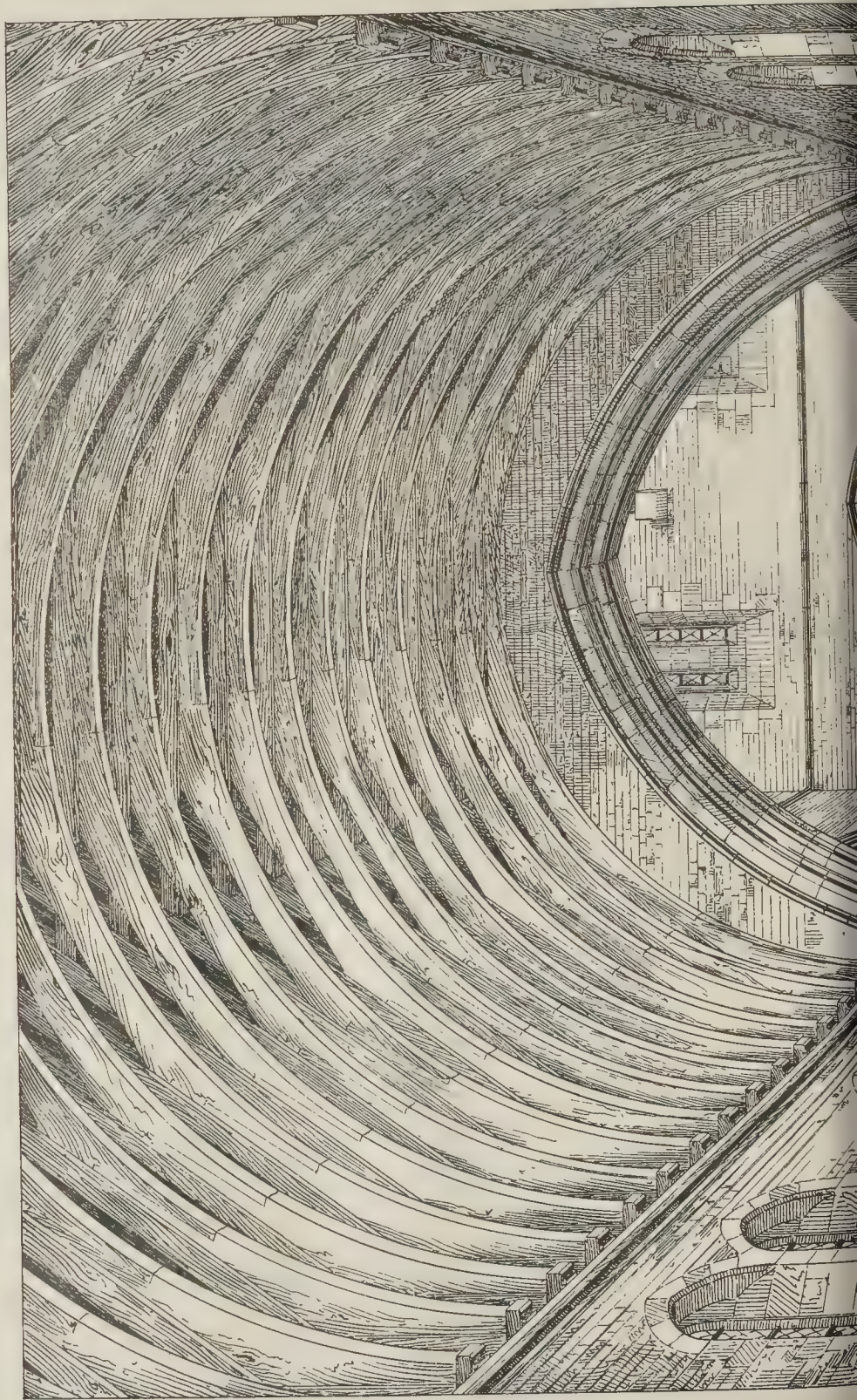
*Residence, Narragansett Pier, R.I.—Mr. Bruce Price, Architect.*

AMERICAN VILLA ARCHITECTURE.

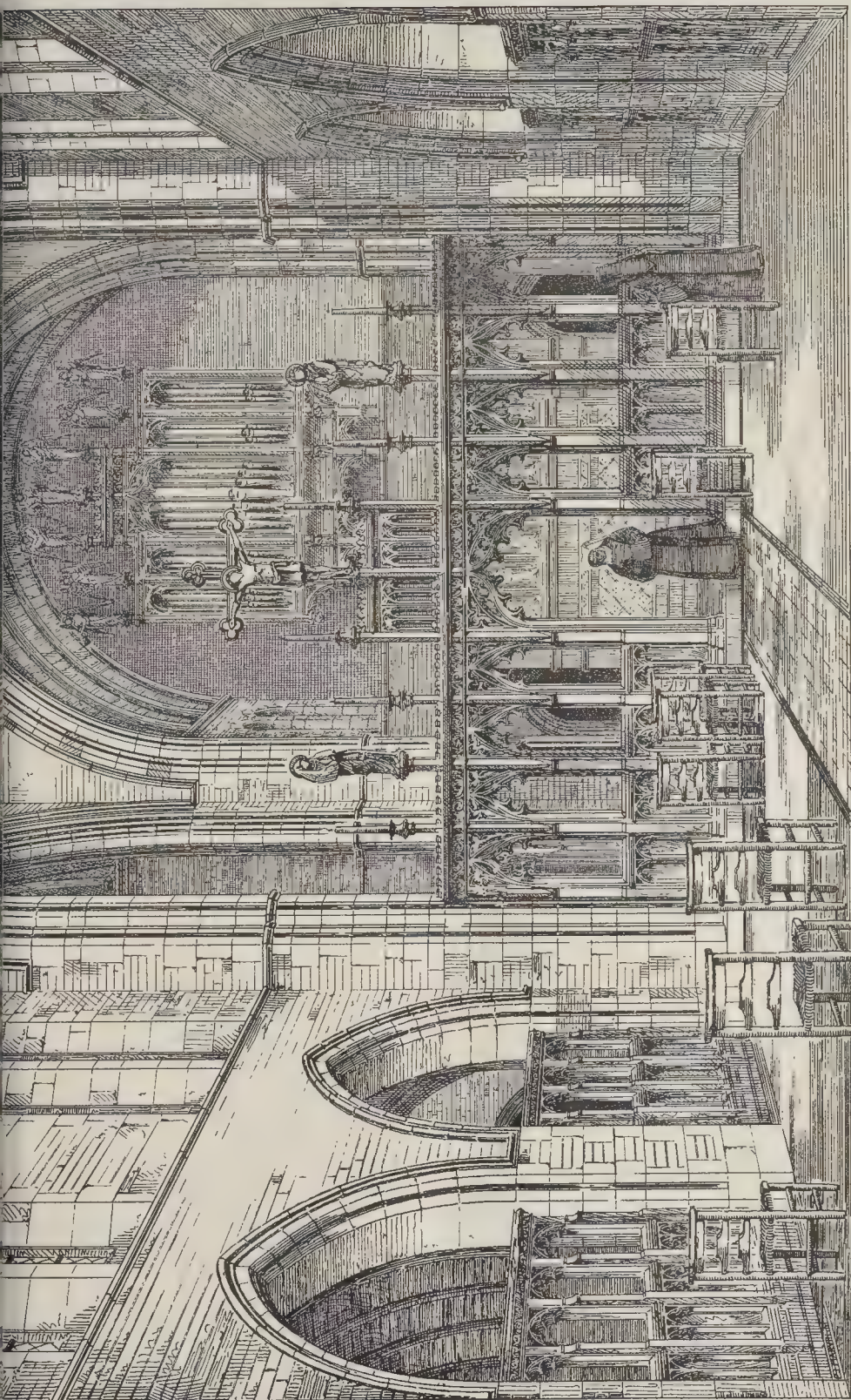




THE BUILDER, APRIL 27, 1889





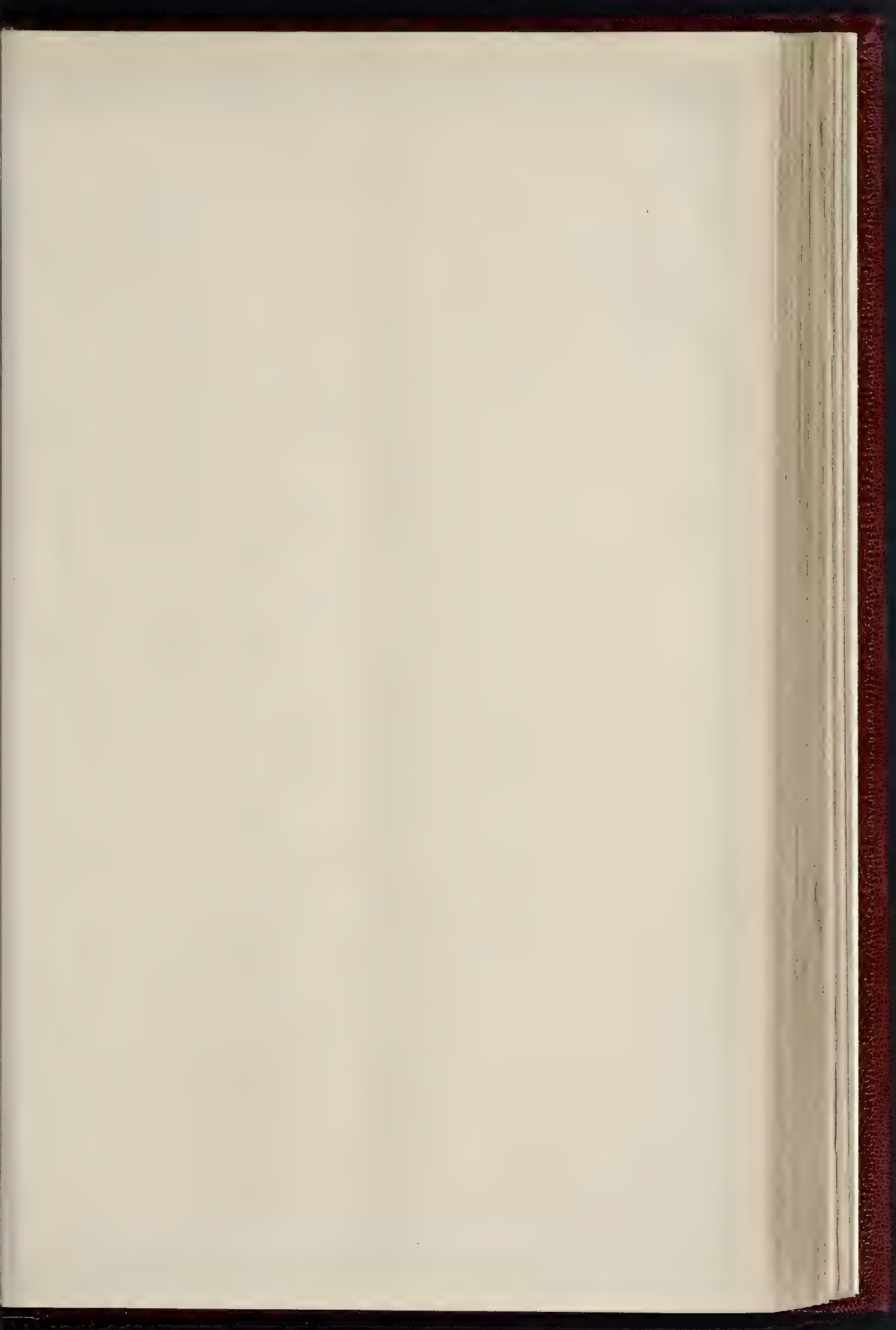


Engraved by J. G. Thompson and J. G. Thompson, D. N. Y.

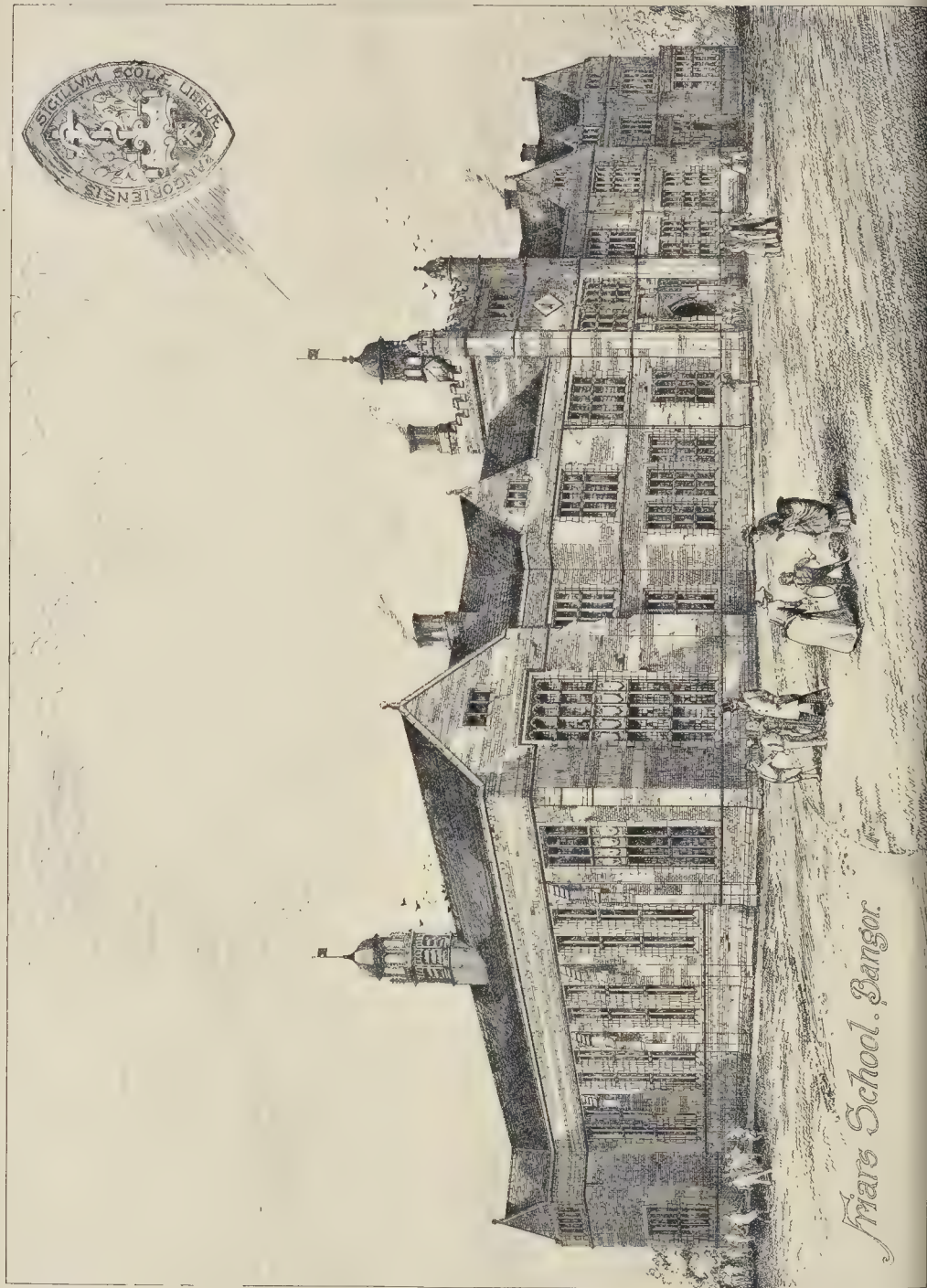
ST. MARY'S ABBEY, MILL HILL.—MESSRS. GOLDIE, CHILD & GOLDIE, ARCHITECTS.  
INTERIOR VIEW.





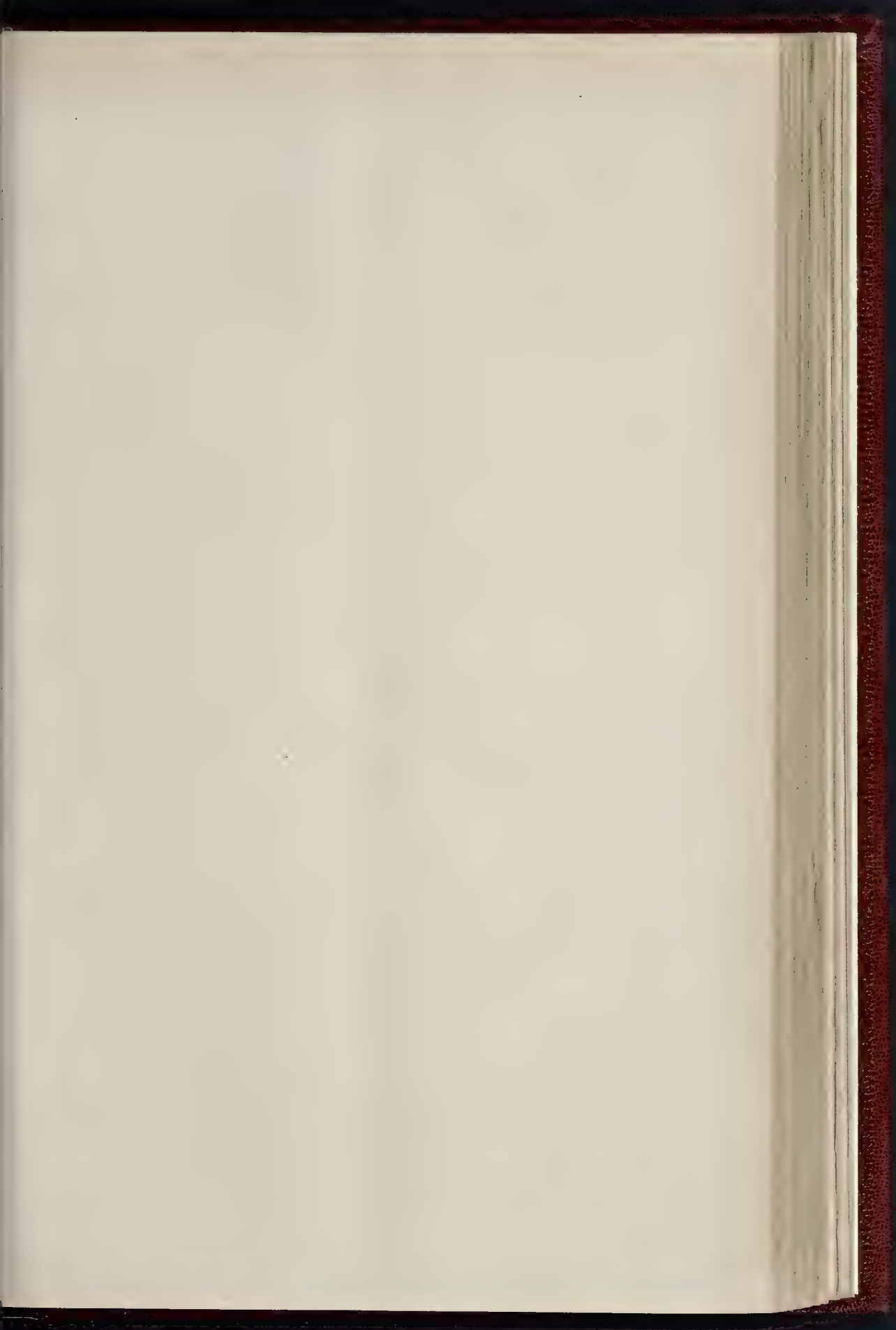


THE BUILDER, APRIL 27, 1889.

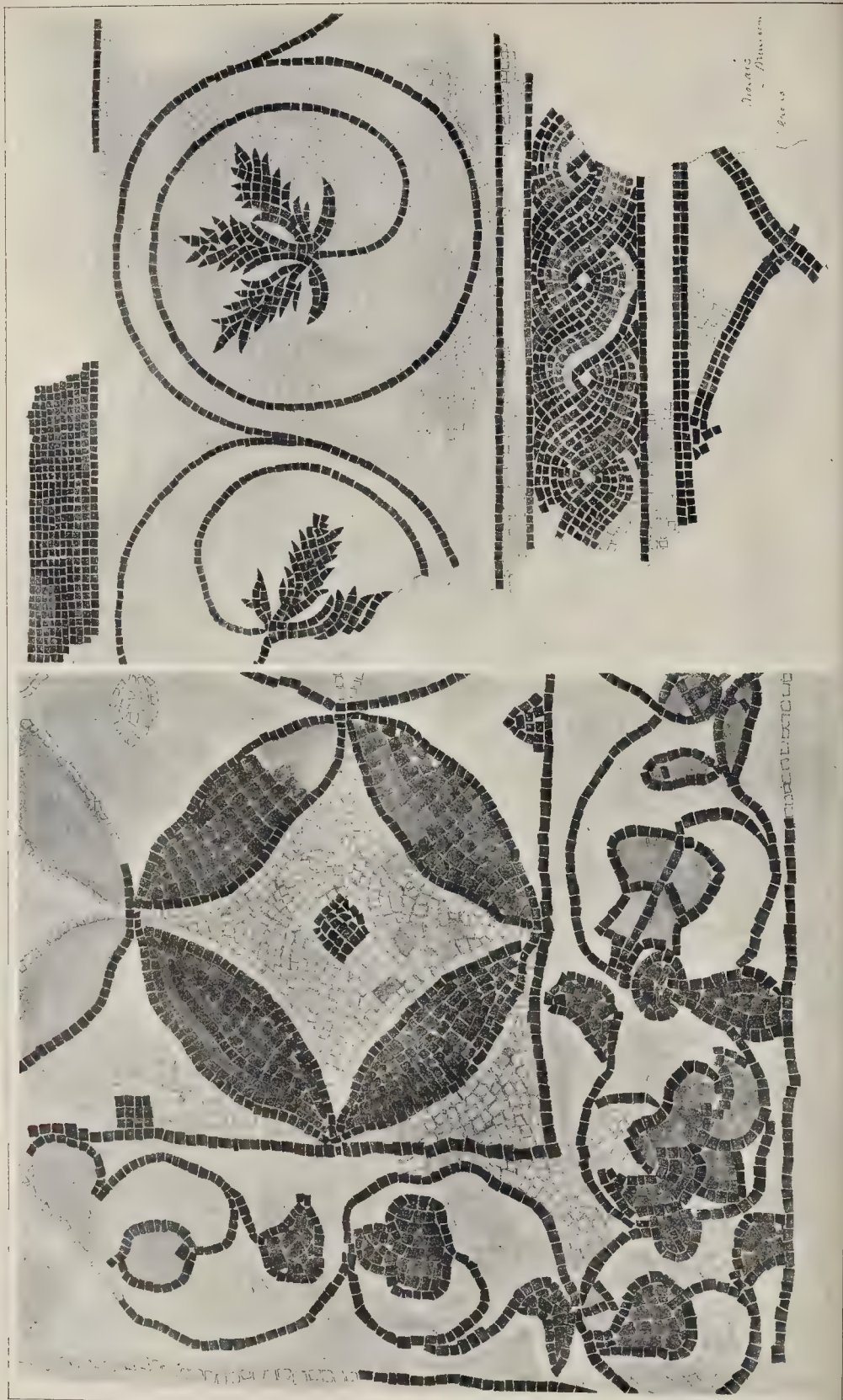


*Bangor School. Bangor.*





THE BUILDER, APRIL 27, 1889.



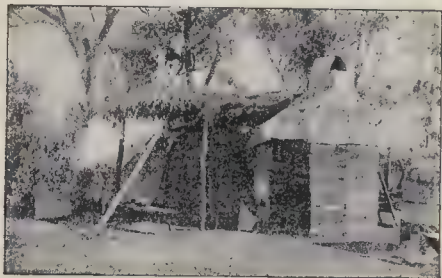




1 FIRST ATTEMPT.



6. A BOARDED HOUSE.



2. EXTENSIVE DEVELOPMENTS.



7. CHINAMENS' GARDENS.



3. A SLAB "HUMPY."



8 RAILWAY OFFICIAL RESIDENCE.



4. IMPROVED "HUMPY."



9 A COURT HOUSE



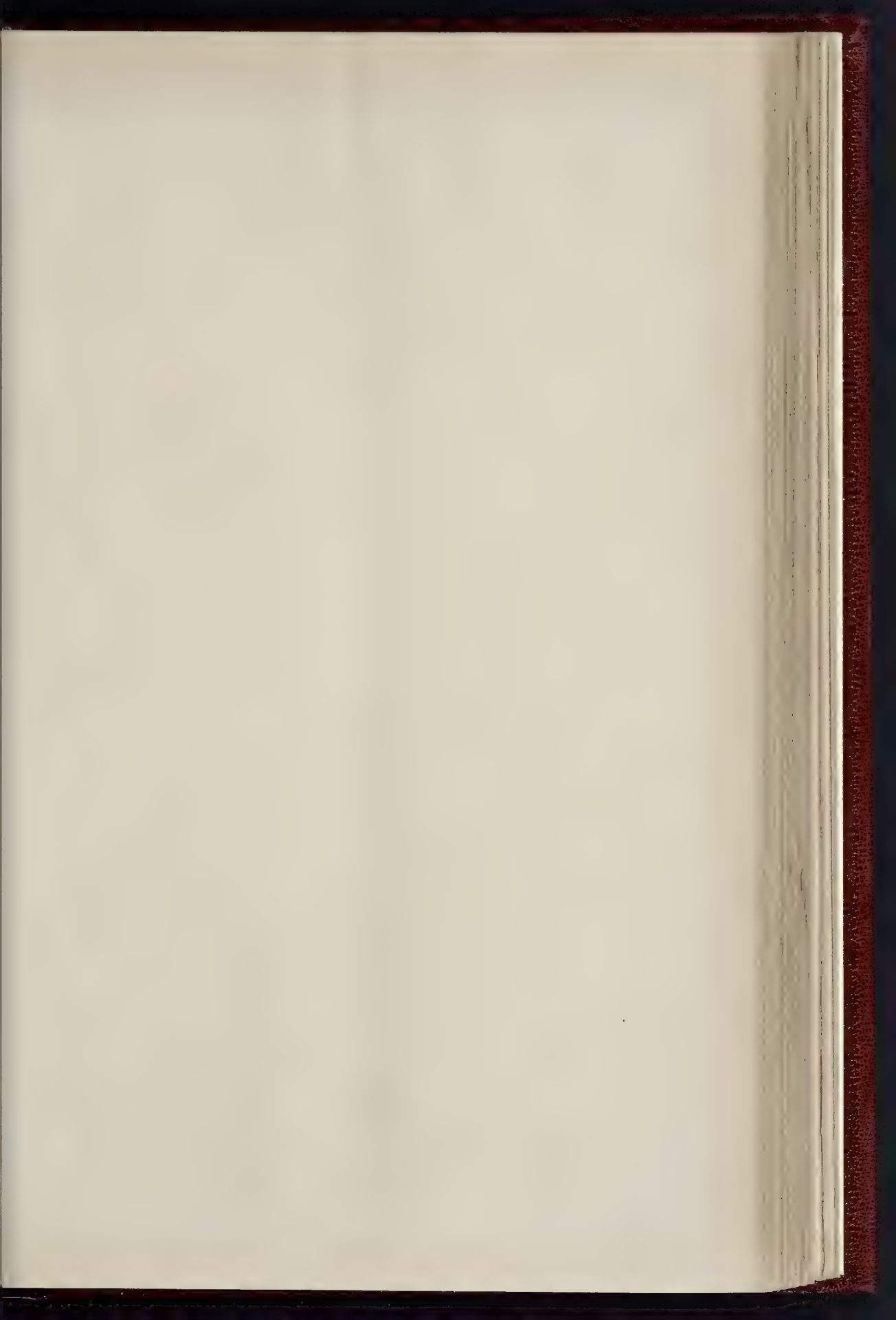
5. FURTHER IMPROVEMENTS.



10 A TOWN HALL.

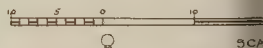








Elevation



SCALE



Transverse Section



# SWINDON NEW TOWN

DESIGN FOR

## Proposed Public Offices

Mr. Brightwen Binyon A.R.C.B.A. Architect.



on (recessed)



ET

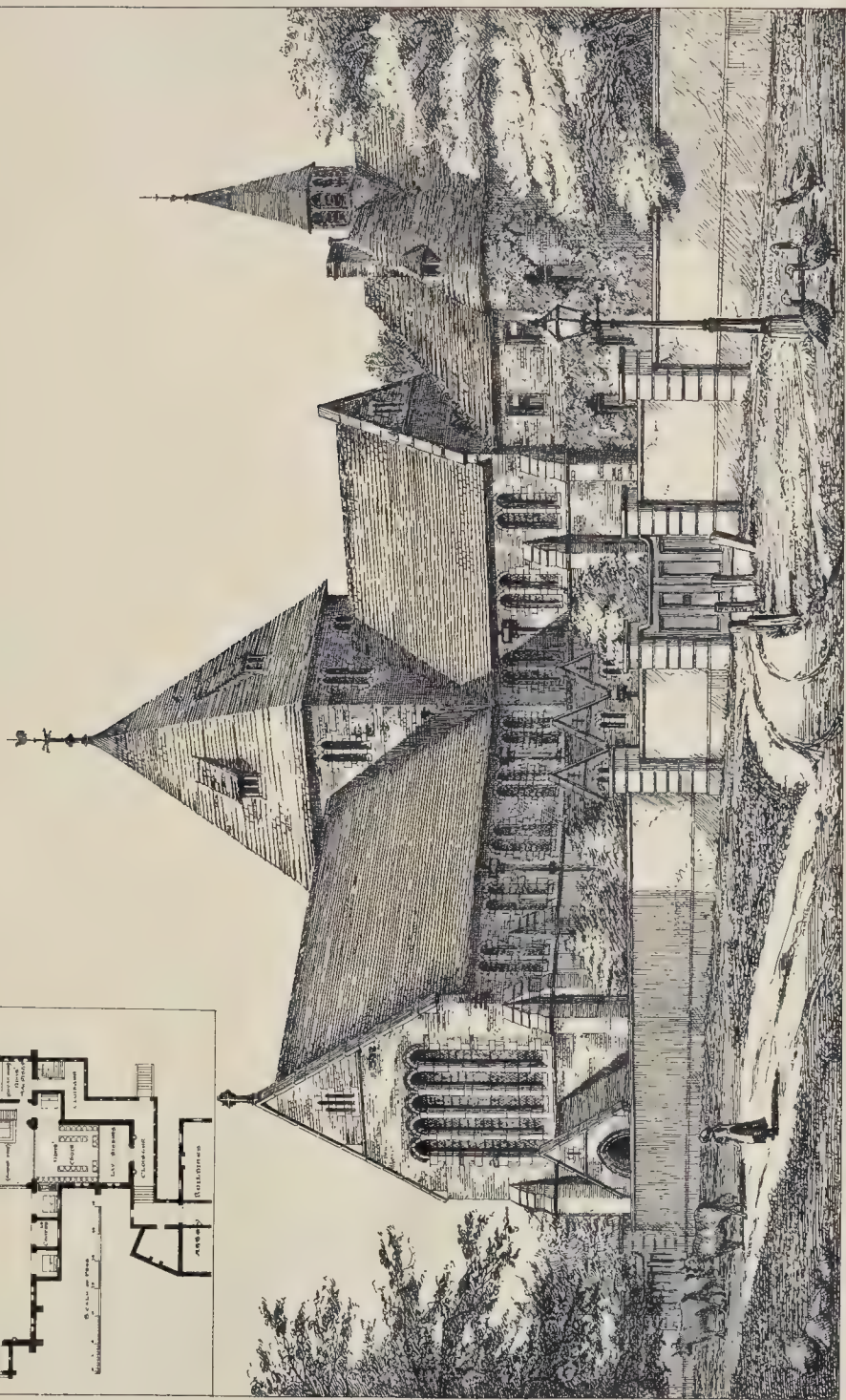


Elevation to York Place

BY PHOTO LITHO. BY J. H. B. & CO. LONDON.



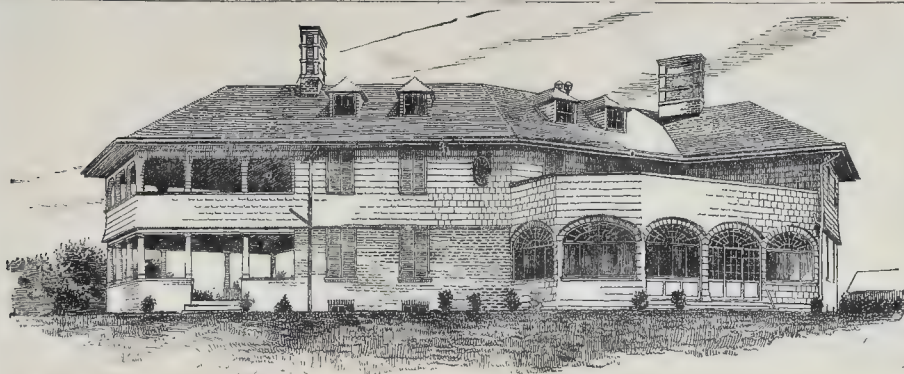




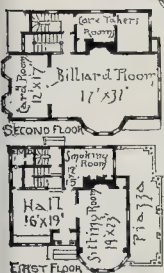
ST. MARY'S ABBEY, MILL HILL.—Messrs. Goldie, Child & Goldie, Architects.  
EXTERIOR VIEW.







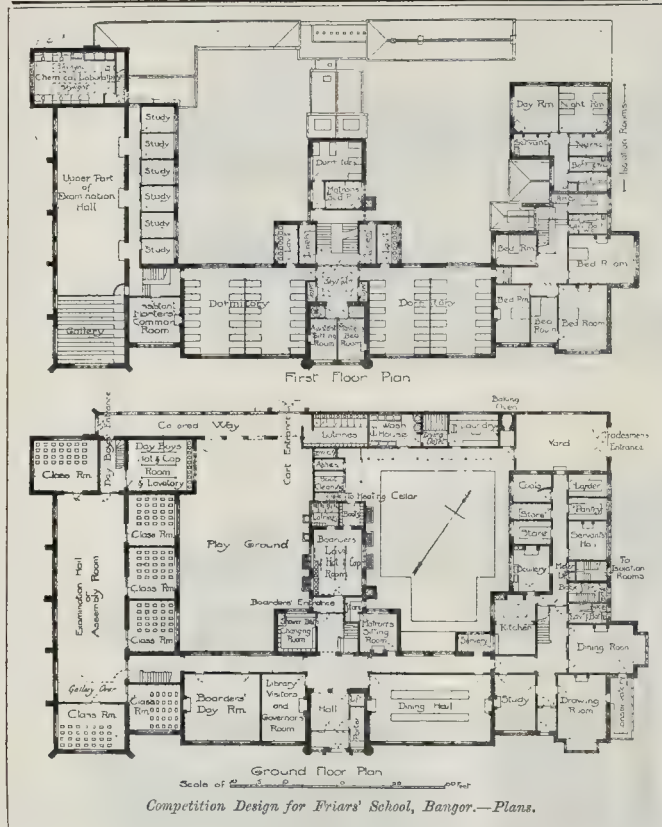
Residence, Far Rockaway, L.I.—Messrs. M'Kim, Mead, & White, Architects.



Club House, Glen Ridge, N.J.—Mr. W. Conway Hazlett, Architect.

AMERICAN VILLA ARCHITECTURE.





### Illustrations.

#### S. MARY'S ABBEY, MILL HILL, N.W.

THIS chapel, which is now in course of erection from the designs of Messrs. Goldie, Child, & Goldie, is in connexion with the convent buildings of S. Mary's Abbey, built for the Franciscan Nuns, some twenty years ago, by the same firm of architects.

The walling externally will be, as in the case of the earlier erected buildings, in red brick with stone dressings, and roofed with green slates. The interior, including cloisters, will be of a light stone-coloured brick, with stone dressings.

The contractor is Mr. S. Parmenter, of Braintree, Mr. Rockhill acting as the clerk of the works.

#### DESIGN FOR THE NEW FRIARS' SCHOOL, BANGOR.

THIS design was submitted by Messrs. Oliver & Leeson, of Newcastle, in the recent competition for the erection of the new buildings for this school, and was awarded the second premium. The plan is of the recognised grammar-school type, and has the strong recommendation of a well-ordered simplicity. The lighting, especially in the case of the class-rooms, is well managed. The examination-hall is of rather ungainly and inconvenient length, but an alternative plan, showing a shorter hall and the class-rooms differently arranged, was submitted. The arrangement of the dormitories is clever. In the exterior of the building the simplicity seems to be a little over-done. The view leaves the impression that, with little trouble and no extra expense, a good deal more might have been made of it; but it is quiet, correct, and characteristic.

The whole of the buildings were proposed to be erected of good common brickwork with facings from Raabon, Cefn stone for dressings, and grey Bangor slate for roofings. The total estimated cost was 8,790*l*.

#### SWINDON NEW TOWN PUBLIC OFFICES.

THESE are the first premiated designs in the recent competition for the above. The building will be situated on a site on rising ground between Old and New Swindon, and is so arranged that a large public hall can be conveniently added at any future time. The ground-floor is devoted to public offices, and the upper floor to board and meeting rooms connected with the public bodies of the town and district. The two large rooms will be heated by hot air, and the smaller rooms by open fireplaces, supplemented by the hot-air apparatus. The ventilation is also carefully considered. The large rooms will have sunlight burners connected by metal tubes, with the exhaust ventilators in the turrets on roof. The building generally will be of fireproof construction; the external walls of red brick, with bath stone dressings, and the roofs will be covered with Bangor slates with tile cresting.

Mr. Brightwen Binyon, of Ipswich, is the architect.

#### ANCIENT ROMAN MOSAICS, VERONA.

THE example taken from San Zeno now forms the footpace of the altar in the crypt. It is probably a relic of an old Roman temple.

The other specimen is taken from a fragment in the museum at Verona. Both pieces are noticeable for their delicacy as well as for their design.

The illustrations are from drawings by Mr. Gerald Horsley, which were in the Royal Academy exhibition of last year.

#### DEVELOPMENT OF HOUSE ARCHITECTURE IN A COLONY.

THESE illustrations are from photographs sent to us by a correspondent lately settled in Queensland, and are given as examples of the growth of practical house architecture in a district of the colony which is still in its early stage of habitation, and as illustrating the early

stages of house contrivance where the builder has to make the best of the materials ready to his hand. They may thus be taken as more or less typical of the progress of man as a house-building animal, in the initial stage of the art. Our correspondent writes:—

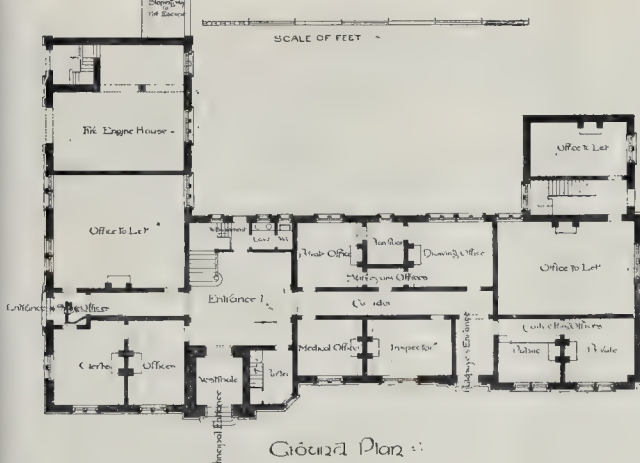
"We will go right into one of the best pastoral and agricultural districts of central Queensland for our illustrations. Selections in most parts of Queensland are either 'scrub' or 'forest.' 'Scrub' is a sort of jungle entanglement of young trees. 'Forest' consists of big trees (but not, as a rule, fit for timber); rails can be split out of the trees when felled if you know how to do it; and the branches and everything else are then all burnt up. A selector first starts off with his 'swag,' which consists of one or two coloured blankets and sometimes a sheet of canvas, with a strip of oil-cloth. The strip of oil-cloth is laid on the ground in wet weather. The man rolls up in the blankets, and the canvas is stretched over him for shelter; and that, as a rule, may be termed the first construction of a great many selectors in this country. The second step is made somewhat after the fashion of the aboriginals, as in photograph No. 1. This is made in the simplest way by means of stakes and branches of trees fixed up to windward as a shelter from the rain. It is quite open in front, and a fire is generally smouldering near it. A more elaborate plan is to cover the roof with bark; and a first-class structure is made by using bark altogether instead of branches. Those who have got used to living in these structures say they are as comfortable to live in as a house. No. 2 is a kind of combination habitation; the chimney-end is made of the boards of a piano-case, or drapery goods boxes, and the upper portion is made out of the tin lining of the case; four poles support some branches, and form a kind of outside dining-room; at the other end a small tent is erected as a sleeping apartment, and thus a somewhat extensive establishment is rigged up. I might as well here state that all these illustrations represent houses that are inhabited, and are, so to speak, in full swing and going order. You will observe the cooking utensils all about. These are neither numerous nor elaborate,—a tin bucket, a 'billy' to boil tea in, and a tin-mug may be said to go a long way towards making up the sum total of the kitchen requisites and utensils considered necessary in these primitive constructions. No. 3 is a 'slab humpy.' The sides are constructed of split wood or slabs; the roof is bark, kept on by poles in the usual way; the chimney is constructed of packing-boxes and tin linings. This is a very useful form of dwelling, and large families often inhabit these kind of buildings. They are partitioned off into rooms inside by being boarded with packing-case wood or canvas. The inside door-places are also covered with canvas, and a bit of thin white canvas often supplies the place of glass in the window. No. 4 is a better-built humpy. It possesses a verandah, has a bark roof, and wood chimney. No. 5 is a still further development of a 'humpy.' It is larger than the other, has a better verandah, and an outside screen. No. 6 is a great advance on the 'humpy.' This building is in the town of Roma, and is made of boards. It has a verandah, the floor of which is also boarded. The windows have no glass in them, and the roof is covered with bark. No. 7 is a Chinaman's house, surrounded by a vegetable garden. The Chinamen all live on swamps or near creeks, and sink wells to irrigate their gardens. No. 8 is a first-class dwelling put up by the Government in connexion with the railway, and is inhabited by railway officials. You will observe the chimneys are built of brick, and there is a large galvanized iron tank for the catching and storing of rain-water. The roof is galvanized iron. There is not a single brick or stone building in the town of Roma, which numbers about 1,000 inhabitants. All the houses are built of wood, are roofed with galvanized iron, and all have these large galvanized iron storage-tanks. Lime costs about 7*l*. a ton; bricks about 6*l*. to 7*l*. a thousand. There is no clay within 100 miles, it is said, fit for brick-making. No. 9 is the Court House and Magisterial Offices. No. 10 is the Roma Town Hall. The Town Hall itself only occupies the centre portion, and on each side are solicitors' offices. It is roofed with shingles,—split pieces of wood put on like slates.

This article and the photographs have been sent with the idea of showing the style of building in the inland towns of Australia, and the





First Floor Plan



Ground Plan

Swindon New Town Public Offices.—Plans.

method adopted by settlers to get a habitation together of some sort in which they can live. All the illustrations are of buildings within a mile of the centre of the town of Roma, Central Queensland."

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

On Saturday, April 20, a party, consisting of members of this Association, paid a visit to Gogar, and inspected the remains of the parish church, Gogar House, and Riccarton House. The party left Waverley Station about two o'clock under the leadership of Mr. Thomas Bonnar, who pointed out the objects of interest in the course of the excursion. Gogar, an ancient but long since suppressed parish, now incorporated with the adjoining parishes of Corstorphine, Ratho, and Kirkliston, was first visited. No part of the church, Mr. Bonnar said, now exists; there only remain portions of the original foundations exposed. At the entrance to the outhouse the ancient font is placed; it is carved in freestone, and the ornamental parts are of a somewhat severe character, and much defaced by exposure to the weather. The building appears to have been demolished soon after the Reformation, and the site of it was set apart as a family burying-place by the then lord of the manor. The church was older than that of Corstorphine, but was of little value, and ministered to the spiritual wants of a scanty population. Soon after the formation of their establishment it was acquired by the monks of Holyrood, but in the reign of James V. it was withdrawn from them, and constituted an independent rectory. In 1429, Sir John Forrest conferred its tithes on the collegiate church which he then formed at Corstorphine, and made it one of the prebends of his collegiate establishment. In 1599, after vain efforts had been made by its few parishioners to raise a sufficient provision for the maintenance of an incumbent, the parish was finally stripped of its independence. In the year 1650, Gogar was the scene of a hot skirmish between the armies of Cromwell and General Leslie.

The party next proceeded to Gogar House, which is a picturesque example of Scottish Baronial architecture, belonging to the early part of the seventeenth century. Mr. Bonnar said it was exceedingly gratifying to find that the original structure, with the exception of the porch, is almost entirely undisturbed. The initials, "H. J. C.," along with the date 1625, appear on the dormer over the west wing. A dormer on the south wing bears the date 1626. The interior is interesting, as much of the original treatment is retained. This is specially so in the case of the apartment now in use as a dining-room. The ceiling here is decorated in hand-wrought plaster, and is very complete. The centre-piece is formed of a boldly-enriched patera, and the corners are filled in with scroll-work. The cornice is also composed of hand-wrought plaster, with egg and dart enrichments boldly modelled. The walls consist of wood panelling with fielding bead and raised style, with a dado formed on the lower part, and are painted white. Over the mantelpiece and above the doors are a series of painted panels, treating conventional architectural forms in light and shade. They are described by the *Scottish Leader* in its report of the excursion as being so beautifully executed that they might have been from the pencil of a Runciman or a De Wint. The mantelpiece itself is of white marble enclosed in woodwork.

Riccarton House, the residence of Sir James Gibson Craig, Baronet, which is situated in the parish of Currie, was subsequently inspected by the party. The main body of the mansion, Mr. Bonnar stated, was built by Sir Lewis Craig, and was finished in 1621, as indicated in the inscription inserted into the south wall of the modern building. But the square tower at the west end, he said, is much older, and retains the appearance of having been at one time a place of great strength. It is supposed to be the property bestowed by King Robert the Bruce as part of the dowry of his daughter when he gave her in marriage to the Steward of Scotland. The more recent additions have been made in the Elizabethan style of architecture by Sir James, the first baronet, and were completed in 1827. Mr. Burn was the architect. The estate formerly belonged to Sir Thomas Craig, the celebrated feudal lawyer, who was born in 1538, and died in 1608. The rooms in the tower are of an earlier date than the restoration of 1825, the walls of these apartments being 4 ft. 10 in. thick; but there is now nothing else remaining of the interior of the original edifice, the whole having been modernised. The collection of portraits is well worthy of notice, notably the Raeburns. There is a quaint inscription let into the wall of the modern building, which has evidently been taken from the ancient part when the additions were made, as appears from the date.

By Godliness the air is established,  
Bot crying sinnes spewis him out of possession.

Vive Des et Vives.

S. L. C.

D.D.

B.C. Anno 1621.

Sit Deus intrantibus Solamen, Praesidium  
exentibus."

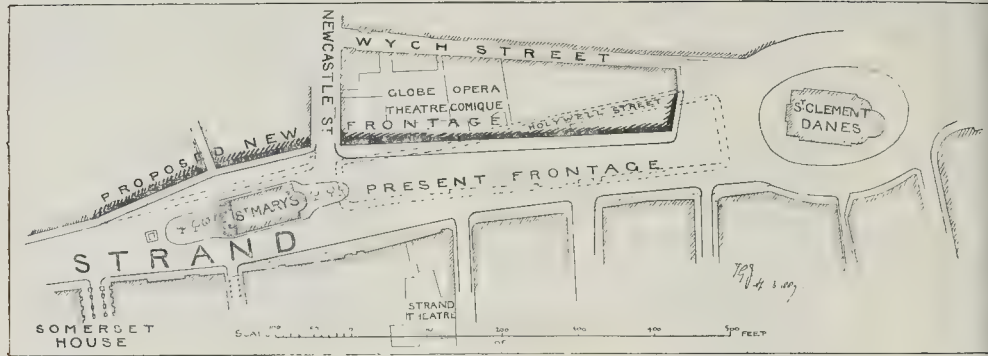
#### CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

THE forty-ninth term of this School was closed at the Palace on Wednesday, the 16th inst., in the usual manner. Sir John Fowler, Past President Inst.C.E., in the unavoidable absence of Mr. Benjamin Baker, presided, and presented the certificates awarded by the Examiners, Mr. J. Courthope Peach, Assoc.I.C.E., M.E., and Mr. W. Jacob Hood, a past Student of the Crystal Palace School.

Mr. F. Shenton read the Examiners' reports, after which

Sir John Fowler addressed the students, apologising for the absence of Mr. Baker, whose duty he had undertaken at a very short notice. Mr. Baker could doubtless have given the students an interesting account of the Forth Bridge, and he (Sir John) would also probably be expected to say something concerning that great work, but he could not do so from Mr. Baker's paper, if he had prepared one. He expressed his admiration of the fulness and excellence of the curriculum of the School, and could assure the students that the advantages they enjoyed in the School were in marked contrast to the meagre opportunities for getting on in his profession that lay within his reach as an articulated pupil. In his early career he had found it necessary to work very hard, and he urged his young friends to make up their minds to apply their powers with energy and perseverance not only at the beginning of their career, but to determine that they would never cease to be students. He (Sir John) had applied himself with zeal to making himself a correct and ready draughtsman, an accurate surveyor and leveller, and a careful and expert calculator. These attainments, however, are not all that is needed to make an engineer. As he had done himself, he would advise the students, to observe keenly, to embrace every opportunity for making notes from works in progress concerning methods, materials, labour, and cost. They should note, for instance, the qualities of clay met with, and the purposes for which it was best adapted, padding or brick-making; so also of sand, gravel, rocks, timber, and other materials. They should embrace every opportunity of acquainting themselves with the cost of important work, note numbers of men employed and time occupied in executing certain quantities, and the wages paid; the angles of slope in different kinds of stuff, and noting where they gave way. Excavations and their cost, and many other matters, were worthy of keen, patient observation, which would enable them to acquire a stock of valuable practical knowledge. They must be quick





Mr. T. G. Jackson's Plan for the Improvement of the Strand.

to avail themselves of opportunities as they came, or such opportunities might not return, and their neglect of them might make their lives failures. "There is a tide in the affairs of men that, taken at the flood, leads on to fortune." As regarded the field in which young engineers were likely to find employment, all of them could not, perhaps, be absorbed at home. He had just returned from India, where, in a tour of about two months, he had travelled 4,000 miles; in that great dependency there was vast scope for the engineer, as there was also in Canada, Australia, South Africa, and our other colonies and dependencies. This he would say with confidence, that England was the best place in the world for the engineer to learn his profession, to get equipped wheresoever his future might be. It would, of course, be the best equipped men, not necessarily those with certificates, although these were valuable, but those who had the best general record, who would be preferred, and engineers having the power to help young aspirants had means of learning the moral and other qualifications of candidates for employment.

With respect to the Forth Bridge, Sir John supposed that it would be expected, from his position, that he would say something about it. It would be easier to talk about it for two hours than to refer to it satisfactorily in a few minutes. The principal peculiarities of the structure arose from the width of the spans in the deep channel, necessitating construction on the cantilever principle. These spans were each of 1,700 ft., or nearly a third of a mile, twice the span of arches in any other bridge in the world. The piers from which the cantilevers spring are built in 60 ft. of water, below which, of course, the foundations are laid. The piers on the south side are founded on glacier clay; the north piers are on sloping basaltic rock. In cutting down in this intractable material, serious difficulties were encountered, owing to the enormous quantity of water that came in upon the excavation from a fissure in the rock. Good foundations had eventually been laid at every point. It might have been thought that massive squared masonry would have been the chosen material for these piers, but it was not so; the material was of rubble, with mortar of the highest quality. The bed-plates on the tops of the piers above high water were enormous masses of metal, upon which the steel piers were carried up, and from which the cantilevers sprang. In the construction of the bridge itself, the permanent work provided scaffolding for the work as it progressed. The completed arms of the cantilevers left level spaces to be filled up for the line of roadway of about 350 ft. each, and different methods of getting these portions into position had furnished matter for grave consideration. It had, after carefully weighing the merits of different methods, been determined to continue in the same course as has been pursued, and to build the level portion piece by piece from the ends of the cantilevers, until the space is filled and the junction completed. It was hard for any one to understand the character or principles of construction of the bridge without seeing it, and he could promise that any of the students or their friends paying it a visit would receive

the attention and facilities they might need to enable them to arrive at an adequate understanding of the subject. Sir John mentioned, in evidence of the magnitude of the work, that it required in the construction upwards of 50,000 tons of steel, 50,000 tons of granite, 22,000 tons of cement, and 200,000 tons of concrete and masonry.

The Chairman then proceeded to present the certificates to the students.

The highest award on this occasion was the Bronze Medal of the Crystal Palace School of Art, Science, and Literature, to Mr. C. G. Angus, student, who had fulfilled the conditions entitling him to it, in having obtained, during his course through the School, nine certificates,—the largest number obtainable,—none of them below the third order of merit. It may be mentioned that the last of the nine certificates awarded to Mr. Angus was for the term that day ended, the Examiners returning him first in the order of merit for work in the third term of the second year's course.

The lectures for the term were on "Steam and the Steam-Engine." Forty-four students attended the lectures, thirty-seven were eligible for examination; twenty-two of these passed satisfactorily. The highest number of marks attainable is 288. Mr. A. Struben was first with 260 marks, and was also second for work in the Fitting-shop. Mr. W. G. Wales was second for Lecture examination with 254 marks, and first for work in the Pattern-shop. In the Drawing-office fourteen certificates were awarded, Mr. A. H. Roberts first. In the Pattern-shop fourteen certificates, Wales, first (see ante). In the Fitting-shop fourteen certificates, Mr. E. M. Pross first, also third for Lecture examination, with 246 marks.

In the second year's course,—Civil Engineering,—for students in the first term,—Practical preparation, by actual surveys, levelling, &c., of plans in detail for Parliament, of a railway and dock,—ten certificates were awarded, Mr. P. B. Mottey, first. To students in the second term,—Working sections and the specifications, working plans, calculations, estimates, &c., of detail of work, for the contractors,—six certificates were awarded, Mr. D. A. Andrus first. To students in third term,—Original designing of the higher examples of bridges, &c., and the general application of principles in practice,—seven certificates were awarded, Mr. C. S. Angus (medallist) first. Three certificates of the first grade were awarded to students in the Colonial Section.

The usual votes of thanks terminated the proceedings.

#### THE CHURCH OF ST. MARY-LE-STRAND.

SIR,—In order to carry the discussion of the widening of the Strand and the removal or preservation of St. Mary's Church a step further, I venture to send you a rough plan to show how I should propose to realise the suggestions made in my letter to the *Times* of April 10, on which you comment in your issue of April 13.\*

\* It is due to Mr. Jackson to say that his letter and plan were sent on before the publication of Mr. Nevill's in our last issue; but as in Good Friday week it is necessary to go to press a day earlier than usual, his plan was unfortunately too late for production in our last issue.—Ed.

The plan is taken accurately from the Ordnance Map, and shows by dotted lines the position of Holywell-street and the houses now lining the north side of the Strand between the two churches. The improvement, obviously, cannot end with the mere removal of the houses between the Strand and Holywell-street; the street would then be as much too wide as it is now too narrow, and the houses on the north side of Holywell-street would not be worthy of the new frontage. Moreover, the obliquity of St. Clement's Church makes it unfit for the centre of the new street. Clearly, under any circumstances, the north side of the widened Strand would have to be rebuilt somewhat in advance of the north side of Holywell-street, and the direction of the new frontage should align or nearly so with the flank of St. Clement's Church, so as to conform to its obliquity.

It is at this point that the question presents itself, what is to be done with St. Mary's Church? If it is destroyed, the houses now standing to the north of it will remain, and the new frontage will be on a line drawn from them to the corner next St. Clement Dane's. But as the whole frontage east of Newcastle-street must be rebuilt, it will be easy to give it the direction shown on my plan so as to avoid St. Mary's Church entirely, and leave a roadway to the north of it equal to that on the south. It is true that in order to do this the houses north of the church must be pulled down and the frontage thrown back, but against this expense must be set that of rebuilding St. Mary's Church elsewhere if it were pulled down, and the probably still greater expense of providing a site for it in so densely crowded a district.

It will be seen by the plan that the deviation from the straight line would be nearly uniform on both sides of the church, so that the island on which the church stands could not possibly impede freedom of locomotion. The pavement round it would form the necessary landing place, which might be prolonged eastward as it already is westward, and afford space for a second clump of trees. The new street would be of a noble width, and besides a splendid roadway for wheeled traffic, would give room for a footway on each side three times as wide as the present one, the narrowness of which is at least as great an evil as that of the roadway. The greatest width of the street occurs opportunistically just opposite the entrances of three theatres, whose audiences, coming out at the same time, now contribute so much to the nightly congestion of the traffic.

On the practical side of the question, I submit that the retention of St. Mary's presents no difficulty. On the architectural side, I need add little to what I have already said. It is of no use arguing with those who think a street cannot be comely or convenient unless you can see from end to end of it; and one cannot find eyes for those who are blind to architectural beauties at their own doors which they would admire on the other side of the Alps. No one, however, can fail to be struck by the practical unanimity of those who are qualified to speak as artists in favour of the preservation of one of the happiest monuments of the English Neo-classic style.

T. G. JACKSON.



Copy of Mr. Stanger's Report on Tests of Lindsay's Fireproof Floor Bricks.

Modulus of Section, 7-26.

BEAMS.

Moment of Inertia of Section=16-33.

| Span in inches.   | Breaking Load in Centre.            |       |       | Calculated Stress on Outer Layer. Per sq. inch. |       | Remarks on Fractures.                                                         |
|-------------------|-------------------------------------|-------|-------|-------------------------------------------------|-------|-------------------------------------------------------------------------------|
|                   | Tons.                               | Cwt.  | Lbs.  | Tons.                                           | Lbs.  |                                                                               |
| 20                | 0-620                               | 12-40 | 1,389 | 0-427                                           | 956   | Two small stones in fracture. One on the neutral axis, one in tension member. |
| 20                | 1-100                               | 22-00 | 2,464 | 0-758                                           | 1,697 | Two small blow-holes. One near neutral axis, one in tension member.           |
| 17                | Corrected to 20-inch span.<br>0-582 | 11-64 | 1,303 | 0-401                                           | 897   | Small stone in compression member.                                            |
| Mean of the above | 0-767                               | 15-34 | 1,718 | 0-528                                           | 1,183 |                                                                               |

## COMPRESSION.

| Length. | Sectional Area. | Load on Brick. |                  | Cracked. | Load on Brick. |                  | Crushed. |
|---------|-----------------|----------------|------------------|----------|----------------|------------------|----------|
|         |                 | Tons.          | Tons per Sq. In. |          | Tons.          | Tons per Sq. In. |          |
| 9½ in.  | 7-33            | 13-52          | 1-845            | 265-7    | 18-58          | 2-535            | 365-0    |

## FIREPROOF FLOORS.

SIR,—I noticed in the columns of your last issue most surprising misstatement by Mr. Fawcett. He states that his "tubular lintel" will sustain more than double the load that mine will, which may be correct in one sense; but, on the other hand, he entirely omits to say that each of his bricks covers about 2½ times the floor area of mine. Hence, in order to compare his bricks with mine, his loads must be divided by 2½, which will show a decided advantage in my favor.

I enclose Mr. Stanger's report on the tests of my bricks; and, in justice to myself, I hope Mr. Mark Fawcett will do the same, so that a comparison can be made.

WILLIAM LINDSAY.

SIR,—I am compelled to ask you to allow me to correct some other misstatements made by Mr. G. M. Lawford in your last issue. He says that my tubular lintels are bricks, that they are 23 times the size of Mr. Lindsay's, and that they were both tested in the same way.

There is no resemblance between my tubes and bricks; to make them even 2½ times the size of Mr. Lindsay's, the extreme width of the bottom, including the lateral flange, would have to be measured (this would be an absurd way to measure, unless the strength of the concrete, which in my floor forms a lintel in itself between each tube, is also added to the strength of the tube); one of my tubes (the freelay one) was not tested in the same way as Mr. Lindsay's, but as it would be in actual use, and broke off at the bearing with a central load of 25 cwt. on it, clearly showing that they are the weakest there. The other two (at Mr. Lawford's suggestion) were tested in the same way as Mr. Lindsay's had been, for the purpose of comparing the strength with his, and I protested at the time that the test was of no other value; they broke with 26 and 30 cwt. respectively. Mr. Lindsay's broke with 11, 12, and 21 cwt. on them respectively, and although there was this enormous difference, a mean strength of 15 cwt. was claimed for them.

MARK FAWCETT.

April 23, 1889.

the vertical opening is no larger than the horizontal inlet and outlet, being only 6 in. for a 6-in. drain. They require, therefore, a taper pipe to be first set into the socket to expand the size of the air-inlet pipe to that required, viz., 12 in. diameter. In making the traps, however, it would be better to form this vertical opening large enough to receive at once the 12-in. air-pipe, without the necessity of employing taper pipes. By some makers the vertical opening is, indeed, now made larger than the horizontal inlet and outlet, when the trap is used as a gully at the surface of the ground, and covered with a grating. It requires only that it be made round instead of square in order to suit the purpose named.

The form of trap in article vi. is called a siphon trap. Like some other terms used in house-drainage, it is inaccurately applied to such a form. It would be a siphon if turned upside down, and the sewage were made to rise over it by a greater pressure of the air at its inlet than at its outlet; but, used as it is, it is simply a dip trap, and acts on the same principle as the older form of mason's trap, as it is now called, which consists of a square tank across which is set edgewise a flagstone, which dips into the water standing in the trap, thus cutting off the passage of air from one to the other side of the dipstone. In some other parts of a system of drainage siphonic action does take place, and it is, therefore, regrettable that the term siphon should have been applied to this water-trap.

There is a form of siphon trap to be seen in many builders' yards and other places,—and, unfortunately, sometimes used also,—which should never be used. As stoppage of the flow of sewage may sometimes occur in a siphon trap, for reasons stated in art. vi., it has been attempted to give access to the trap by forming a vertical branch in its middle, as in the accompanying fig. 1, a stopper being placed in

movements which it cannot make without more power behind it than there generally is in a trap, and, the current being almost wholly destroyed, the trap soon fills with sediment.

In a siphon trap with a clear and uninterrupted run through the throat, even although it may be contracted,—and contraction of the throat is beneficial rather than not so,—the impulse with which the sewage enters the trap is continued to the outlet unabated; but in the objectionable form just mentioned, the impulse is lost at the first dip, none being left to continue the flow under the second one. The intervening body of water becomes stagnant, and allows sediment to be readily deposited on the bottom of the trap.

There are two other forms of trap which are objectionable,—2 and 3 of the accompanying figures. No. 2 is called a D-trap, and has been much used under water-closets, between the basin and the vertical soil-pipe, or between the basin and the drain in closets situated on the basement floor. When made of lead, as it usually has been, and too large, the force of the discharge of water through it is lost in putting in motion the extraneous body of water which surrounds the end of the pipe which projects into the trap, and therefore the soil is not carried forward with the water. The flow through this trap is not often altogether stopped, because the discharge into it has considerable force; but when the trap is of lead and too large it collects soil around the sides, which are out of reach of the current through it. Its form is not continuously the same from inlet to outlet. It has been mostly used in connexion with the form of water-closet basin called a pan-closet, wherein a tinned iron or copper pan, holding a small quantity of water, is hinged to one side of an iron container under it, and in which it swings, discharging the soil through the container into the trap below; but the large size of the iron container, and the irregularities of the line of discharge through it, and the material of which it is formed, are all objectionable, resulting in its continually foul condition. Neither iron nor lead should be used for the two parts named. Earthenware is the proper material. The other form of trap which we said was so objectionable,—fig. 3,—is called a bell trap, and used to be always used on the surface, either at the mouth of the discharge-pipe or waste-pipe of a scullery sink or other such sink, or else at the surface of the ground over a sewage-inlet to the drain, in the place of a gully. The objections to it are that it soon becomes clogged with dirt, there being too much surface of iron exposed to the passage of the sewage in proportion to the dimensions of the waterway, and the course which the waste water must take being so irregular; first under the lip of the bell, and then over the edge of the outlet pipe. This objection applies whether the grating which covers it is loose or is hinged to one side of the trap, but with a loose cover there is the additional objection that the frequent stoppage of the trap induces people to throw the cover aside, thereby opening a direct communication with the drain; and even with a hinged cover it is but little better than when the cover is loose, for it is easily thrown back and the pipe left open. In all parts of house-drainage it should be considered that they are under the command of persons who know little about their construction or the effects of interference with loose parts, and therefore, unless it be absolutely necessary, no part should be so formed that it may be inadvertently removed.

The brick chamber shown in art. xiv., the place of which is at M on the sketch plan, serves the purpose of inspection of the drain under the house floor in case of stoppage or leakage, without unnecessarily disturbing the floor in the first instance. By taking up the small flagstone at N, and removing the sealed cover of the upright junction pipe, this length of drain can be tested, and it can be quickly ascertained whether any further disturbance is necessary. If the drain be found to be water-tight and free from obstruction, it is a great relief of anxiety, for it disposes of the main portion of the drain, and the inspection chamber is found to be a good appliance and well worth what it has cost to make it; but its chief purpose is to let fresh air into the drain-pipe, which traverses its whole length to the ventilating pipe at the far end; not rapidly, but with a sufficient degree of movement to keep the air of the drain free from stagnation and consequent foulness.

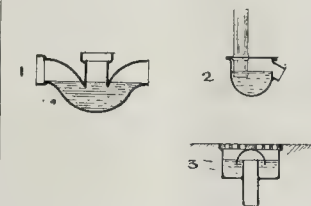
Now, there are situations where the drain

## The Student's Column.

## TOWN DRAINAGE.

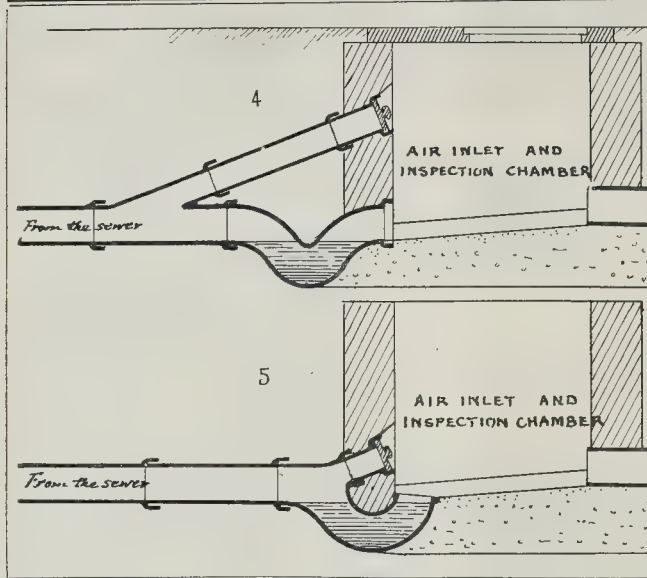
## XVII.—TRAPS: AND SOME PRECAUTIONS.

WHEN the depth of a drain is not greater than will admit of the intercepting or disconnecting trap being easily reached from the surface, we have shown how the bottom of the air inlet may be formed with bricks, upon which a vertical pipe may be carried up art. viii., Feb. 23), also how the waste water from a sink in the basement may be discharged into a gully outside (xiv., April 6), with brickwork, upon which a smaller air-inlet pipe may be set and carried up to the surface. But traps are made, for those who prefer them, which combine the three necessary openings, viz., (1) to receive the end of the horizontal drain-pipe, (2) the outlet of the trap, and (3) the pipe which conveys the air down from the surface to the drain. In the article No. iv. five forms of trap are drawn: the second and third are of the form which combines the three openings just named. As usually made,



the socket when the ground is intended to be filled in over the trap, or, in other cases, a pipe or two is carried up from it to the surface of the ground, to afford a ready means of access for clearing out accumulations of dirt in the trap. But, as we have said, this form of trap should never be used, for at the very point where of all others an easy passage of the sewage is most necessary to be provided,—that is, in the throat of the trap,—a re-entering angle is here opposed to its passage, and instead of the flow of sewage following an easy curve, it must pass first downward, then upward, and downwards again before it can finally escape and pass away. But these are





below this air-inlet chamber is so covered, either with a great depth of earth, or has upon the surface over it a roadway of much traffic, the interference with which might be objected to by the road authority, that it is desirable to find some means of inspection of this lower portion of the drain without disturbing the surface over it. Such a means has been devised by forming upon one of the drain-pipes a sloping branch, such as that shown in fig. 4, through which a long rod may be pushed into the drain below, to remove an obstruction if it be there.

Of course, this part of the drain is in direct communication with the sewer, being below the intercepting or disconnecting trap of the house-drain, and the air in it may be foul: at any rate, it is as bad as, and probably worse than, the sewer air. The end of this branch, therefore, in the air-inlet chamber is closed with an airtight plug, which is removed only when inspection is necessary. That is to say, it should not be removed at any other time, and especially should not be left out of its place for any length of time. Any workman who may be employed about the drain knows that the end of this branch should remain sealed, and he will see that it is so as long as it is under his eye, but, for the same reason that a loose cover of a bell-trap is a dangerous thing, so is this. Any one may remove the iron grating and look into the air-chamber to ascertain whether anything is amiss there, and may enter and remove the plug if he thinks that will do any good. This appliance, therefore, should not be adopted without due consideration. There are cases where the care of the house drainage can be entrusted to a responsible person, who will take care that nothing be interfered with unnecessarily. In these cases it is safe, and where it is safe it is a great convenience to have this means of inspection of the lower portion of the drain. The figure 5 is for the same purpose, and may be a little better than 4, or not so, according to circumstances. The second figure in art. xv. shows an air-inlet and inspection-chamber, which may be safely applied anywhere, and which is sufficient for all situations unless it be in some districts of London where the house drains have been connected with the sewer in a more than usually inefficient manner, making that portion of the drain between the front area and the sewer unusually liable to stoppage, either from want of fall in the drain or leakage from the joints; but London is not all England, and except where the conditions in other towns resemble those of the districts of London situated on gravel-beds, where the house drains have but little fall,—say, 1 in 100 or 120,—and where the joints of the drain pipes below the intercepting trap have not been made water-tight; except under these conditions and those we have before mentioned, an inspection opening of the kind is not so requisite as is sometimes represented.

#### VARIORUM.

"Dod's Handbook to the London County Council" (London: George Bell & Son, York-street, Covent-garden; and Whitaker & Co., White Hart-street, E.C. Price 1s.) will supply "a felt want," inasmuch as, in the words of the preface, it "is designed to afford information to all who are likely to be brought into business relations with the London County Council or its individual members or Committees." This little reference-book is edited by the Editor of "Dod's Parliamentary Companion," and so far as we have been able to test its statements, we have found it to be, on the whole, exceedingly accurate. The names, ages, occupations, and antecedents of the aldermen and councillors are given, together with the number of years the aldermen have to serve (some being elected for six years; others for only three years). The results of the polling at the elections (the numbers of the votes recorded and the names of the unsuccessful as well as the successful candidates) are also given, and the names of the chairmen of the twenty provisional committees are separately set forth. We cannot but attempt anything like a complete analysis of the *personnel* of the Council, but it may be of interest if we mention that it contains two architects, Mr. R. W. Edis, F.S.A. (not "F.R.S.A." as it is erroneously put), and Mr. F. S. Brereton, F.R.I.B.A.; four builders,—Messrs. G. Bethell Holmes (Chairman of the Building Act Committee), J. Marsland, R. Roberts, and L. Stevens; one civil engineer,—Mr. C. Horsley; four mechanical engineers; five medical men; several peers and Members of Parliament; a sprinkling of naval and military officers; a few literary men and journalists; many manufacturers and merchants; and a large number of barristers and solicitors. Only some six or seven members of the late Metropolitan Board of Works (out of twenty-eight or thirty who were candidates) have obtained seats on the Council. "Dod" will be as indispensable hereafter in this his new departure as he has hitherto been in the Parliamentary field. —We have received a copy of the new edition of the "Pall Mall Gazette Extra, No. 47," which is entitled "The Popular Guide to the House of Commons, 1889, and to the London County Council, with 'Mems. about Members,' and 100 Portraits" (London: Pall Mall Gazette Office. Price 6d.). This is a marvellously cheap and handy reference-book, and contains a great deal of useful information. The portraits are not all of them "speaking likenesses," it is true, and the "Mems. about Members" are characteristically dished up with a greater amount of *sauce piquante* than will be agreeable to many palates. Nevertheless, the Pall Mall "House of Commons and County Council" will be found of great service by politicians and ratepayers of all parties. —"The Trade of the United Kingdom," by

Thomas J. Dymes, B.A. (London: Elliot Stock, 62, Paternoster-row. Price not stated), is a useful manual of instruction and reference, giving, as its title-page states, "a concise account of the sources and supplies of our chief imports and of the distribution of our chief exports, with an abstract of our trade with each country of the world, and of the trade of the chief ports of the United Kingdom," &c. According to the preface, it owes its birth to recent efforts in the direction of the improvement of "commercial education." A great portion of the book has been avowedly written and compiled for the use of students; but it contains a mass of well-digested and carefully-arranged statistics which will be found of much service for purposes of reference. The figures given are based in great part on the Board of Trade's "Annual Statement" for 1886 (that for 1887 not appearing until the book was approaching completion), and the average of the five years 1882-86 is taken. The author says that "notwithstanding the keen competition of our neighbours and the world generally, the natural growth of their own manufactures as they advance in wealth, and their efforts to import foreign commodities direct, and thereby to dispense with our services, it is satisfactory to note that the volume of our trade has again been steadily expanding during the last two years, and that England still remains the market of the world." —"London in 1889," by Herbert Fry (London: W. H. Allen & Co., 13, Waterloo-place, S.W. Price 2s.) is this year's issue of an excellent guide-book to London, which we noticed at some length last year. It is illustrated by twenty bird's-eye views (serving as route-maps) of the principal streets, although the lettering on the cover disagrees with that on the title-page (and with the fact) in stating the number of these views to be only eight. There is also a useful general street-map of central London, and a map showing the relative positions of the suburbs and environs of the metropolis. We notice that several mistakes which we pointed out in last year's issue of the book have been corrected in the present issue, which we can heartily recommend to visitors to London. Indeed, many Londoners themselves, especially in view of the changes made during recent years, might derive much instruction from the work, which contains within a small compass a great deal of historical information interwoven with the topography. A further recommendation of the book is that it is well indexed. —"The Wedding Ring: its History, Literature, and the Superstitions Respecting It," by Joseph Maskell, A.K.C. (London: Simpkin, Marshall, & Co., Stationers' Hall-court. Price 2s.) is a well-got-up and entertaining little book (now in its second edition), presenting in a concise form a series of interesting points for the archaeologist and the student of very wide interest. —"Coach Trimming," by William Farr and George A. Thrupp (London: Chapman & Hall. Price not stated), is a useful illustrated handbook, issued by the sanction of the Coach and Coach-Harness-Makers' Company of the City of London, and is one of a series of handbooks which have been produced at their instance for the instruction of workmen in the trade. It is tersely written, and admirably adapted to the end in view. —"Infection and Disinfection," by Robson Roose, M.D., F.C.S. (London: Chapman & Hall. Price not stated), consists of a useful reprint from the *Fortnightly Review*, with additions. The author very clearly discusses the various theories of infection, and adopts the view that infection is conveyed by means of micro-organisms. He also describes the best methods of disinfection, and, we are glad to see, points out that deodorisation and disinfection are not synonymous terms. Deodorisation may be effected, and may often lull people into a false sense of security, without actually destroying the *virus* of a disease. Unless this *virus* be completely destroyed there is no real disinfection. The pamphlet is one which may be read with profit by every householder. —"Jarrold's Norwich and Eastern Counties Handbook, 1889" (Norwich: Jarrold & Sons. Price 6d.), is a very useful handbook for Norwich and neighbourhood, and it includes a clerical directory for Norfolk and Suffolk. It gives particulars of all the various public bodies, societies, and institutions of Norwich, but it contains no list of the local banks,—an omission which should be supplied in future editions. —"Shelley & Co.'s Complete Press Directory for 1889" (London: Shelley & Co., 5, Leaden-



all-street. Price 1s.) is the third edition of a very useful work of reference. A good feature in it is its summary of "Leading Newspaper Law Cases" for the year 1888. A bulkier and larger work of the same kind is "The Advertiser's A.B.C." (London: T. B. Browne & Co., 63, Queen Victoria-street, E.C. Price 10s. 6d.). This work forms a very complete directory to be London and Provincial newspapers, magazines, reviews, &c., and to the chief colonial and foreign papers. It is very copiously indexed.—"Sells' Directory of Registered Telegraphic Addresses" (London: Sells' Advertising Agency, 167, Fleet-street. Price 9s.) is now in its fifth year. It has been completely revised, and now contains more than 30,000 of the best names in the mercantile world, with their registered telegraphic addresses. It consists of three main sections, (1) names of firms alphabetically arranged, (2) telegraphic addresses alphabetically arranged, and (3) Sells' telegraphic code, which will be found useful. The Post Office authorities, we are, still refuse to give any assistance to the compilers of the work.—"Street's Indian and Colonial Mercantile Directory for 1888-9" (London: Street & Co., 30, Cornhill. Price 5s.) is the twelfth issue of that now indispensable work. It is admirably arranged and reduced, and is increasing in size and value with each issue. We have on former occasions spoken in terms of high commendation of the volume, which is fast approaching in bulk the London Post Office Directory. It contains several excellent maps, and a fund of official and commercial information as to India and all our colonies and dependencies, with statistics of population, imports and exports, &c. Each important city or town has its own separate official and commercial directory.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

7,165, Window Sashes, Frames, and Fittings. H. H. Couch.

The sashes which are the subject of this invention are hung each counterbalancing the other, and the frame of the sash is made removable, and with special arrangements for excluding moisture. The sashes are also interchangeable and removable for purposes of cleaning, &c.

7,327, Bricks and Building Blocks. H. G. Law and F. B. Potts.

The brick or building block which is the subject of this patent is made of clay, terra-cotta, porcelain, stone, or iron, of somewhat similar shape to those in general use, but pierced in one or more places and the cavities charged with barcol in the form of cubes. These cubes are removable, and they may be replaced with fresh barcol, without disturbing the bricks or blocks.

8,355, Improved Flue-cap. J. B. Cohen.

In order to prevent down-draught and to increase up-draught, an apparatus is, by this invention, fixed on the outlet of the flue, a case of metal or terra-cotta, with the sides, ends, and top furnished with openings partially closed by fixed or movable louvers (which are disposed so as to deflect the air striking against them, always in an upward direction, thus preventing the possibility of down-draught). Other louvers deflect the currents horizontally, and the diverging currents reduce a partial vacuum and the smoke is drawn up.

12,225, Safety Contrivance for Use in Cleaning Windows. K. Bernhard.

This invention consists of a device to prevent persons falling out when cleaning windows. It consists of tubes or folding-bars, and is arranged so that it can be folded up or tied very quickly. Angle pieces are provided with means for fastening the whole apparatus to the ledge or sill of window.

15,725, Cowls or Ventilators. S. Worsenoff.

The body of the cowl or ventilator which is the subject of this patent is of a cylindrical or slightly conical form, and is provided with a number of air tubes or passages of a smaller diameter, and preferably of a flattened rectangular section. The tubes are open at the top and bottom, and pass through the cylindrical or conical body of the cowl in an inclined direction, so that their outer lower ends are exposed to the atmosphere outside the body, and their inner and upper ends meet about the centre of the inside. They are arranged alternately in pairs, each pair meeting in the centre at an angle of about 30 deg., and an ascending induced current of air is thus created up the centre of the cowl or ventilator, and all down-draughts are effectually prevented.

2,632, Artificial Building Materials. J. G. Glen.

According to this specification, a material suit-

able for cornices, linings for passages, partitions, roof-coverings, &c., for building, which is capable of being slightly bent and of having nails or screws driven into it without breaking or cracking, and of being sawn with an ordinary saw, is produced by mixing sawdust and plaster of Paris, &c., and spreading it upon jute such as is used for packing. The substance is built up with alternate layers of the plaster and jute.

2,890, Window-fasteners. G. Robinson and H. James.

The window-fastener which is the subject of this patent is of the ordinary screw-in type, but with this difference, that two short metal tubes revolve one within the other, and a system of letters or signs allow only the window to be unfastened when they are in juxtaposition. The system, therefore, must be known to the person operating the fastener. The windows cannot be opened by any unauthorised person.

## NEW APPLICATIONS FOR PATENTS.

April 8.—5,952, E. Allen, Construction of Dwellings for the Poor.—5,959, R. Horne, Automatic Window-fastener and Ventilator.—5,957, C. Gardiner, Fence for Planes.—5,989, T. Graham, Device for Fanlights, &c.—5,999, W. Jennings, Nails.—6,009, A. Mantle, Kitchen-ranges.—6,018, R. Hadden, Belt or Binding for Paint-brushes.

April 9.—6,037, S. Grimshaw, Opener for Windows, Ventilators, &c.—6,054, R. Wilding, Ventilation of Water-closet Basins.—6,101, T. Dault, Casement Windows and Doors.

April 10.—6,123, W. Ramsbottom, Flushing Water-closet Basins.—6,152, W. Williams, Ventilator for Buildings.—6,155, W. Charlton, Double Hinges.—6,157, T. France, Raising and Lowering Window-sashes.—6,166, H. Adeane, Fixing Sash-lines to Sashes.

April 11.—6,177, J. and B. Taylor, Preventing the Shipping of Ladders, &c.—6,179, J. Simpson, Raising, Lowering, and Sustaining Window-sashes.—6,183, L. Friedrich, Tombstones, Memorial Tablets, &c.—6,187, J. Hardy and F. Saunders, Steps consisting of Iron Frames and Tesselated Tiles.

April 12.—6,246, J. Howie, Syphon Cisterns for Flushing Water-closets, &c.—6,261, F. Meriton, Chimney-pot.—6,293, D. Hildersley, Flushing Cisterns for Water-closets, &c.—6,305, J. Coulthart, Sanitary Socket-pipes, &c.—6,310, J. Gibson, Tombstones, Monuments, and Statuary.—6,346, J. Wolf, Plastic Fire and Weather Proof Wood Mass.—6,373, F. Schmalz, Saw-sharpening Machines.—6,380, E. Edwards, Roof Ventilators.—6,382, F. Bartlett, Heating and Ventilating.—6,389, Sir E. Harland and C. Gray, Elastic Tile Floorings, &c.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

512, J. McPinn, Mortising-machine.—2,408, H. Lake, Ornamenting in Relief Walls, &c.—2,962, P. & E. Brannon, Construction of Buildings, &c., of Cement, Concrete, &c.—3,339, J. Groom, Heating Buildings, &c., by Hot Air.—3,354, H. Mansfield, Others, Blocks or Bricks.—3,729, H. Mansfield, Attachment for Pointing Trowels.—3,763, W. Mitchell and W. Hare, Chimney Cowl or Pot.—3,833, T. Kemp, Testing House-drains.—4,009, W. Henderson, Fastening Window-sashes.—4,220, W. Smith, Sewer and House-drain Traps.—4,501, R. Harman, Ventilator.—4,541, W. Nightingale and others, Cement.—4,650, W. Hoar, Compositors for Decorative Purposes.—4,817, C. Cole, Band-saw Setting Machine.—4,895, J. Marks, Catches or Fasteners for Doors.—5,068, R. Blyth, Automatic Sash-fastener.—5,073, G. Wallis, Ventilating and Flushing Sewers.—5,083, W. Dunn, Water-closets.—5,163, T. Elliott, Flushing Syphon.—5,188, F. Newman, Sash-fasteners.—5,245, B. Pitt, Window-sash-fasteners.—5,260, A. Carpenter, Fasteners for Window-sashes.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

6,707, T. Craddock, Stoves or Kitcheners.—7,225, W. Russell, Stoves and Fireplaces.—7,419, W. Stone and H. Turner, Cisterns, &c.—7,962, T. Stead, Metallic Screen for Theatres, &c.—7,991, J. Craig, Flush-out Water-closet Basins.—8,630, P. Clark, Kitchen-ranges.—9,163, T. Twyford, Water-closets.—1,363, J. Clayton and C. Tindall, Water-closets.—1,422, T. Oakley and E. Smith, Ventilation of Buildings, &c.—2,857, W. Meister, Planes.—4,076, J. Taylor, Self-closing Doors.—4,286, J. Winskill, Gun, Kilm for Burning Limestone.—4,326, J. Fryer, Extracting Cowl or Ventilator.—4,395, B. Busse, Ventilating Buildings.

**Appointment.**—Mr. W. Stringfellow, assistant in the office of the Borough Surveyor of Southampton, has been promoted to the post of Assistant Borough Surveyor, vice Mr. Weston resigned.

**Professor Corfield, M.D.**, has been elected a Corresponding Member of the Italian Association "Dei Benemeriti," and awarded a gold medal for his contributions to hygiene.

RECENT SALES OF PROPERTY:  
ESTATE EXCHANGE REPORT.

|                                                                                         |        |
|-----------------------------------------------------------------------------------------|--------|
| APRIL 15.—By MADDOX & SON.                                                              |        |
| Oxford-st., James-st.—F.g.r. £45, with reversion in 14 yrs. to e.r. of £110 p.a.        | £1,410 |
| By G. A. WILKINSON.                                                                     |        |
| Isleworth—Freehold house and 3a, St. 34a, r.                                            | 2,010  |
| £75 p.a.                                                                                |        |
| Russell-sq.—34, Woburn-pl., ut. 31 yrs, g.r.                                            | 850    |
| £18, 18a, r. £100 p.a.                                                                  | 360    |
| Wandsworth—7, Granville-rd., f., r. £30 p.a.                                            |        |
| By J. C. PLATT.                                                                         |        |
| Acton—F.g.r. of £18, 1a, reversion in 79 yrs. to £141, 14a, p.a.                        | 375    |
| By COLLINS & COLLINS.                                                                   |        |
| Hornsey—20, 22, 24, and 26, Sandyvale-rd., f., r.                                       | 1,600  |
| £138 p.a.                                                                               |        |
| APRIL 16.—By G. HEAD & CO.                                                              |        |
| Upper Baker-st.—No. 13, ut. 33 yrs, g.r. £35, r. £120 p.a.                              | 900    |
| By RUTLEY, SOY, & VINE.                                                                 |        |
| Hampstead-rd.—7, Rutland-st., ut. 35 yrs, g.r.                                          | 485    |
| £8, 8a, r. £35                                                                          |        |
| Euston-rd.—36 and 37, Thane-st., ut. 17 yrs, g.r.                                       | 285    |
| £14, r. £28 p.a.                                                                        |        |
| By EASTMAN BROS.                                                                        |        |
| St. George's, E.—6 to 11, Ellen-pl., ut. 9 yrs, g.r.                                    | 255    |
| £12, e.r. 168 p.a.                                                                      |        |
| By PARCET, VENABLES, & CO.                                                              |        |
| Hadley—Residence, Hadley Cote, f., r. £50 p.a.                                          | 450    |
| 171 and 173, High-st., f., r. £34, 10a, p.a.                                            | 490    |
| Freehold residence, r. £25 p.a.                                                         | 405    |
| Freehold blacksmith's shop, r. £10 p.a.                                                 | 185    |
| The Times, f., r. £120 p.a.                                                             | 1,730  |
| 1 and 2, Clyde-rillas, f., r. £25 p.a.                                                  | 1,525  |
| Barnet—226 and 228, High-st., f., r. £51 p.a.                                           | 985    |
| 201 and 203, High-st., f., r. £23 p.a.                                                  | 1,405  |
| 75 and 77, High-st., f., r. £25 p.a.                                                    | 1,200  |
| Union-st.—L.g.r. of £5, term 63 yrs                                                     | 120    |
| Plot of freehold land, r. £22 10a, p.a.                                                 | 200    |
| 106, High-st., f. and c., r. £45 p.a.                                                   | 1,210  |
| 96, High-st., f., r. £50 p.a.                                                           | 1,050  |
| F. house and shop, e.r. £20 p.a.                                                        | 300    |
| APRIL 17.—By WATSON & SON.                                                              |        |
| Britton—174, 176, and 180, Farnside-rd., ut. 75 yrs, g.r. £15, r. £106 p.a.             | 635    |
| 1, 2, and 5, Bythorn-st., ut. 75 yrs, g.r. £8, r. £109 p.a.                             | 710    |
| 6 and 10, Bythorn-st., ut. 75 yrs, g.r. £10, r. £72, 16a, p.a.                          | 440    |
| 2 to 8 (even), and 11, 13, and 16, Glendall-st., ut. 75 yrs, g.r. £3, 10a, r. £250 p.a. | 1,920  |
| 6 and 8, Shannon-gr., ut. 75 yrs, g.r. £8, r. £50, 18a, p.a.                            | 450    |
| Battersea—31, Wilson-st., ut. 63 yrs, g.r. £26, 10a, r. £10, 10a, p.a.                  | 55     |
| By S. PRANCE & SONS.                                                                    |        |
| Holloway—9, Hollingsworth-st., ut. 55 yrs, g.r. £8, r. £34 p.a.                         | 275    |
| Stoke Newington—102, Winston-rd., ut. 71 yrs, g.r. £5, r. £30 p.a.                      | 275    |
| By HOBSON, RICHARDS, & CO.                                                              |        |
| Wandsworth—F.g.r. £4, reversion in 92 yrs. to £30 p.a.                                  | 128    |
| By WALKER & RUYT.                                                                       |        |
| Old Ford—38 to 48 (even), Armagh-rd., ut. 71 yrs, g.r. £18, 18a, r. £158 p.a.           | 907    |
| 58 to 62 (even), Armagh-rd., ut. 70 yrs, g.r.                                           | 600    |
| £12, 12a, r. £104 p.a.                                                                  | 1,050  |
| Kingsland-rd.—No. 143, f., r. £70 p.a.                                                  | 90     |
| Chadwell Heath—Plot of f. land.                                                         |        |

[Contractions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; ut. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

## HEALTH CONGRESS AT HASTINGS.

We have received the prospectus of the Health Congress to be held in the Royal Concert Hall, Warrior-square, St. Leonards-on-Sea, next week, from April 30 to May 4, under the presidency of Dr. B. W. Richardson, F.R.S.

The Domestic and Sanitary Exhibition, held in connexion with the Congress in the Central Recreation Ground, Hastings, will be opened on Monday next, April 29, at 2.30 p.m.

The Congress will commence on Tuesday evening, April 30, at 8 o'clock, when the opening address will be delivered in the Royal Concert Hall, by the President, Dr. Richardson.

On Wednesday, May 1, section A of the Congress, devoted to "Sanitary Legislation" (including legislative measures for the public health at home and abroad), will be opened at 10 a.m., when the President of the Section, Mr. Wilson Noble, M.P., will deliver his address. This will be followed by papers and discussions on various subjects, including one on "The Census," by Sir Edwin Chadwick.

On Thursday, May 2, Section B, devoted to "Health of Towns, Municipal Sanitation," will be opened, under the presidency of Major-General Webber, R.E., who will deliver an address. Papers and discussions will follow, including one on "The Disposal of the Dead," by Dr. E. Haward.

On Friday, May 3, Section C, devoted to "Domestic Health" (including educational training), will meet, under the presidency of Dr. Frederick Bagshawe. After the President's address there will be papers and discussions.

On Saturday, May 4, at 3 p.m., Dr. Richardson will deliver an address to the working classes, illustrated by the oxy-hydrogen lantern.



## MEETINGS.

SATURDAY, APRIL 27.

**Architectural Association.**—Visit to New R.C. Church, Spanish-place. Meems. Goldie, Child, & Goldie, architects.

MONDAY, APRIL 29.

**Surveyors' Institution.**—8 p.m.  
**Leeds and Yorkshire Architectural Society.**—(1) Secretary's Report. (2) Election of Officers. 7.30 p.m.

TUESDAY, APRIL 30.

**Architectural Association.**—Members' Soirée.  
**Institution of Civil Engineers.**—(1) Further Discussion on Sir Nathaniel Barnaby's paper on "Armour for Ships." (2) Mr. W. H. Greenwood on "The Treatment of Steel by Hydraulic Pressure." 8 p.m.  
**Society of Antiquaries.**—Anniversary. 2 p.m.  
**Society of Arts (Foreign and Colonial Section).**—Captain Wiggins on "The Northern Waterway to Siberia." 8 p.m.  
**Royal Institution.**—Dr. Jean Paul Richter on "The Italian Renaissance Painters." 1. 3 p.m.  
**Glasgow Architectural Association.**—Social Meeting and Annual Exhibition of Members' Drawings.

WEDNESDAY, MAY 1.

**Institution of Mechanical Engineers.**—Ordinary General Meeting. The President (Mr. Charles Cochrane) will deliver his inaugural address. 7.30 p.m.  
**Society of Arts.**—Mr. W. H. Prescott, F.R.S., on "Secondary Batteries." 8 p.m.  
**Builders' Foremen and Clerks of Works' Institution.**—Ordinary meeting. 8.30 p.m.

THURSDAY, MAY 2.

**Royal Institution.**—Mr. E. Muybridge on "The Science of Animal Locomotion in its Relation to Design in Art." 1. 3 p.m.  
**Royal Archaeological Institute.**—Mr. J. Lewis André on "Ritual Ecclesiastical in East Norfolk." 4 p.m.  
**Institution of Mechanical Engineers.**—Ordinary General meeting (continued). 7.30 p.m.  
**Sanitary Institute.**—Mr. B. Amnigson, on "Rural Epidemics." 8 p.m.  
**Edinburgh Architectural Association.**—Mr. J. Gordon, on "Carving." 8 p.m.

FRIDAY, MAY 3.

**Architectural Association.**—(1) Nomination of Officers for the ensuing Session. (2) Mr. J. Starkie Gardner on "Ecclesiastical Wrought Iron Door Furniture." 7.30 p.m.  
**Royal Institution.**—Sir Henry Roscoe, M.P., F.R.S., on "Aluminium." 8 p.m.  
**Institution of Mechanical Engineers.**—Ordinary General meeting (continued). 8.30 p.m.

SATURDAY, MAY 4.

**Association of Municipal and Sanitary Engineers and Surveyors.**—Home Counties' District Meeting at Southampton.  
**Association of Public Sanitary Inspectors.**—Annual address by the President (Sir Edwin Chadwick).

## Miscellaneous.

**Wood-Block Flooring.**—We have received from Mr. Roger L. Lowe, of the Britannia Works, Farnworth, near Bolton, a copy of his new catalogue or hand-book of wood-block flooring, which has now been very largely used, and with great satisfaction to the numerous architects who have specified it, as is apparent from the long array of testimonials which Mr. Lowe prints. We have on a former occasion spoken in high terms of the merits of Mr. Lowe's system of wood-block flooring. For churches, schools, and other buildings this flooring is especially well adapted, inasmuch as it is dry, durable, firm, comparatively noiseless, and offers no space for the harbouring of mice or beetles. The preservative composition by which each block is cemented to the concrete foundation is an important feature of Mr. Lowe's method of laying wood-block floors.

**Glasgow Archaeological Society.**—The monthly meeting of the Glasgow Archaeological Society took place on the 18th inst., in the Philosophical Society's Rooms, Bath-street, Dr. Jolly presiding. The first paper read was one on "The Incised Bulls of Burghhead, and their Supposed Connexion with Mithraism," by Dr. James Macdonald, after which a communication on "Egyptian Scarabs—their Meaning and their Lessons," by Mr. J. Macnaught Campbell, was read by Mr. Govan Greenless. A stone axe, found at Cloven, Milngavie, was exhibited by Mr. A. N. Bertram.

**Royal Academy: Architectural School.** The class for Architectural Modelling has terminated for the session, and a series of demonstrations will be given by Mr. Stannus, on architectural foliage, from six to eight, on Monday and Thursday evenings, as follows:—**Analysis.**—I. The Leaf, April 29; II. The Stem, May 6; III. Beginnings and Ends, May 13. **Historical Development.**—IV. Egyptian, Assyrian, Greek, May 20; V. Roman, Byzantine, Arabic, May 23; VI. Romanesque, Gothic, May 27; VII. Italian and French Renaissance, May 30; VIII. German, Flemish, and English Renaissance, June 3.

**Association of Municipal and Sanitary Engineers and Surveyors.**—A Home Counties' District Meeting at Southampton, on Saturday next, May 4.

## Overcrowding in Newcastle-on-Tyne.

The *Newcastle Chronicle* of the 26th inst. contains an article on the overcrowding caused in that city amongst the poor people dispossessed of their houses by the operations of railway companies. The *Chronicle* says that "the space in front of the North goods station is now an open one, and all the old houses, with certain remains of the Town Wall, from North Banks to Hanover-square, have been pulled down. The Back-rows and Ballifgate are gone, and stretching across the ground where those thoroughfares used to be are immense brick arches and foundations, strongly faced with stone, upon which the new lines of the railway company will in course of time be placed. Nearer the High Level Bridge workmen are widening the railway approach from the Central Station to the bridge. Hundreds of houses of the working-class and poorer class type have disappeared to make way for the work now in progress, and the change in the aspect of the locality is certainly one of the most remarkable kind. While the railway improvements have led to wholesale displacement in the Westgate direction, it must be admitted that the condition of the working-class and of the still humbler classes of town-people has not been improved.

**The Chinese and Light and Air.**—We laugh sometimes at the civilisation of the Chinese, but they could teach us a lesson in a useful art. In his description of one of the cities on the Yang-tse, Mr. Little observes:—"Were such an outrage as the Queen Anne Mansions are to London to be contemplated here, the Dragon and the Tortoise, in the shape of an infuriated mob, would rise from their sleep of ages to overthrow the ill-omened erection." But in China the rules of geomancy, or Feng-shui, the science of wind and water, would make such buildings impossible. To injure the community and affront the *genius loci* by intercepting the kindly influences of Nature is a crime in China. Mr. Justice Kekewich had to give a decision the other day as to the Feng-shui of the hideous structure which the Queen Anne and Garden Mansions Company proposed to rear to the skies; and, fortunately for the artistic sense of coming generations, the decision is against the company. An injunction has been issued restraining the defendants from carrying out their project in the way intended. The Guards' Memorial Chapel is, therefore, not to be deprived of light, and the horizon is not to be made more unsightly than it is already.—*St. James's Gazette.*

**Peterborough Brick Trade.**—We hear that this trade, from the brickfields adjoining the Great Northern Railway Co., Fletton Siding, is increasing in a most surprising manner. The demand for the pressed bricks for some time past being large and constant, the makers have more than once raised the price, but still the orders continue coming in. Something like 150,000 bricks are now being sent away daily, and there is believed to be every probability of even this large number being considerably increased in the immediate future. The Great Northern Railway Company for some time past have been in the habit of sending one special engine daily to take the bricks from the siding to the Peterborough goods yard, but the number of bricks sent away has so very much increased that they are now compelled to send daily two special engines for this purpose.

**Spanish Exhibition in London.**—It is announced that the Spanish Exhibition, to be held in the building and grounds at Earl's-court, West Brompton, which were used for the Italian Exhibition last year, and for the American Exhibition two years ago, will be opened in May. The *City Press* says that Mr. Ernest A. E. Woodrow, A.R.I.B.A., assistant architect of the American and Italian Exhibitions, has been appointed architect of the Spanish Exhibition.

**Further Stringency of Building Laws in Sweden.**—In addition to the recently-enacted stringent building laws in Sweden, chronicled in our columns, a further order has been issued by the Building Board of Sweden to the effect that any builder who undertakes the erection of a house of stone above one story in height without being qualified by certain Swedish institutes named in the order, is liable to criminal prosecution.

**The Garrick Theatre.**—This theatre was opened a day or two ago. It was described and illustrated (with view, plan, and section) in the *Builder* for June 30, 1888. Mr. Walter Emden is the architect.

**A Discovery at Naples.**—The Naples correspondent of the *Daily News* writes:—"While some repairs were lately being made under a house belonging to Baron di Donato, which is situated in the northern quarter of the city towards the slope of the hill of Capo di Monte where already many ancient catacombs have been found, a doorway (over which there is a marble relief of the head of Medusa) was discovered, leading into a subterranean chamber. Along the centre of this chamber runs a mosaic pavement, and on each side there is a double row of sepulchres hewn in the rock, the fronts of which are stuccoed and painted, and decorated with terra-cotta and marble reliefs. Within the tombs were perfect skeletons, vases, and other objects; the antique lamps being in such good condition that yesterday, April 18, while this new find was inspected by a party of German archaeologists, the workmen made use of them to light up the vaults. The many well-preserved inscriptions are chiefly in Greek, with some in Latin, and prove that the epoch of these tombs was about 1,000 B.C. Other tombs in a second chamber have not yet been excavated. It is probable that this subterranean dwelling of the dead may extend some distance, and prove to be a portion of a large necropolis."

**The English Iron Trade.**—The English iron market has been rather quiet on the whole during the week, but this quietness must be attributed more to the intervention of the holidays than to any falling-off in trade. There are indications that a very busy season is before us, the present tone of the market being one of great firmness, with a rising tendency. Pig-iron has been sold at full rates, and even at an advance. Scotch warrants, as well as prices quoted for makers' iron, have been improving. Cleveland pig is quite 6d. a ton higher, and Bessemer iron has increased 1s. in value. Manufactured iron continues in full demand, and prices are very strong. Sheets are quoted 2s. 6d. and 6s. a ton more. The tin-plate trade is active, and buyers show more inclination to place orders. There are large numbers of contracts for steel in the markets, notably for rails, but more particularly for shipbuilding material. Steel blooms, billets, and slabs are quoted 2s. 6d. a ton more. Shipbuilders, who are working busily, and are launching a large tonnage, are still in the receipt of fresh orders. Engineers are fully employed, and will continue so for some time to come.—*Iron.*

**The Late M. Chevreul.**—The *Illustrated London News* of Saturday last publishes what is stated to be a very good portrait of the late M. Chevreul, the distinguished French chemist, distinguished not only for his work as a scientist, but for the great age which he reached. He was born at Angers on August 17, 1781—three years before the Revolution, and he died on the 9th inst., in his 108th year. He had been in 1813 he was appointed Professor of Chemistry at the Lycée Charlemagne. He became Director of the Dyeing Department, and Professor of that special branch of chemistry at the Gobelins Tapestry Factory. His fame as a man of science was enhanced by his original investigations of the chemical conditions determining the production of colours. He was a copious writer, one of his treatises being on colours and their applications in the industrial arts. He is stated to have preserved his mental faculties unimpaired to the last.

**Obituary.**—We regret to announce the death of Mr. George Livermore Shorland (late of Manchester), which took place at his residence, 11, Laurels, High Barnet, near London, on the 12th inst. The remains were conveyed to Manchester, and were interred at the Manchester Southern Cemetery on the 25th inst., the coffin being borne to the grave by workmen in the employ of Mr. E. H. Shorland (late Shillitoe Shorland). Mr. G. L. Shorland was well known in connexion with warming and ventilating, and was the patentee of the well-known Manchester Grate and Manchester Stove. Since his death he had ceased to take an active part in the business of manufacturing his patent appliances, which has, therefore, been conducted by his son, Mr. E. H. Shorland.

**Well at Harrington.**—With reference to the paragraph on p. 304 of our last issue as to the artesian well at Harrington, we are asked say that the well was bored for the Metropolitan Police, under the direction of Mr. John Bull, Surveyor to the Metropolitan Police, not the Office of Works.

**The Art-Union of London.**—The general meeting for the distribution of prizes will be held at the Adelphi Theatre, on Tuesday, May 1.



## PRICES CURRENT OF MATERIALS.

| TIMBER.                     |          | £ s. d. |    | £ s. d. |    |
|-----------------------------|----------|---------|----|---------|----|
| Greenheart, B.G.            | ton      | 6       | 10 | 0       | 7  |
| Teak, E.I.                  | ton      | 11      | 0  | 0       | 15 |
| Benignia, U.S.              | foot end | 0       | 2  | 0       | 3  |
| Asb, Canada, 1st            | load     | 3       | 10 | 0       | 0  |
| Birch                       | load     | 3       | 10 | 0       | 0  |
| Elm                         | load     | 4       | 0  | 0       | 0  |
| Oak, Danisic, do.           | load     | 0       | 0  | 0       | 10 |
| Canada                      | load     | 2       | 10 | 0       | 0  |
| Cine, Canada red            | load     | 3       | 5  | 0       | 0  |
| Yath, Danisic, yellow       | load     | 3       | 10 | 0       | 0  |
| St. Petersburg              | load     | 5       | 0  | 0       | 10 |
| Valencia, Riga, do.         | load     | 2       | 15 | 0       | 0  |
| Other qualities             | load     | 0       | 0  | 0       | 0  |
| Denia, Finland, 2nd and 1st | load     | 9       | 0  | 0       | 11 |
| do. 4th and 3rd             | load     | 8       | 0  | 0       | 0  |
| Riga                        | load     | 7       | 10 | 0       | 0  |
| St. Petersburg, 1st yellow  | load     | 11      | 0  | 0       | 15 |
| do. 2nd                     | load     | 10      | 0  | 0       | 11 |
| do. white                   | load     | 7       | 10 | 0       | 10 |
| Sweden                      | load     | 9       | 0  | 0       | 15 |
| White Oak                   | load     | 9       | 10 | 0       | 0  |
| Canada, Pine, 1st           | load     | 18      | 0  | 0       | 20 |
| do. 2nd                     | load     | 11      | 0  | 0       | 17 |
| do. 3rd                     | load     | 0       | 0  | 0       | 0  |
| do. Spruce, 1st             | load     | 9       | 10 | 0       | 11 |
| do. 3rd and 2nd             | load     | 7       | 10 | 0       | 0  |
| New Brunswick, do.          | load     | 6       | 15 | 0       | 0  |
| do. 2nd                     | load     | 6       | 10 | 0       | 0  |
| Flooring Boards, 1 in.      | load     | 0       | 11 | 0       | 0  |
| pared, First                | load     | 0       | 8  | 0       | 0  |
| Second                      | load     | 0       | 8  | 0       | 0  |
| Third                       | load     | 0       | 6  | 0       | 0  |
| Fourth                      | load     | 0       | 4  | 0       | 0  |
| Other qualities             | load     | 0       | 4  | 0       | 0  |
| St. Domingue, cargo average | load     | 0       | 4  | 0       | 0  |
| Mexican                     | load     | 0       | 4  | 0       | 0  |
| Tobacco                     | load     | 0       | 0  | 0       | 0  |
| Honduras                    | load     | 0       | 0  | 0       | 0  |

## TIMBER (continued).

|                    |      |    |   |   |    |
|--------------------|------|----|---|---|----|
| Box, Turkey        | ton  | 4  | 0 | 0 | 12 |
| Rose, Rio          | ton  | 15 | 0 | 0 | 20 |
| Bahia              | ton  | 14 | 0 | 0 | 19 |
| Satin, St. Domingo | foot | 0  | 0 | 0 | 1  |
| Porto Rico         | foot | 0  | 0 | 0 | 1  |
| Walnut, Italian    | ton  | 0  | 0 | 4 | 0  |

## METALS.

|                            |     |    |    |   |    |
|----------------------------|-----|----|----|---|----|
| Iron—Bar, Welsh, in London | ton | 5  | 5  | 0 | 10 |
| do. at works in Wales      | ton | 4  | 15 | 0 | 0  |
| Staffordshire, in London   | ton | 5  | 10 | 0 | 0  |
| Copper—                    |     |    |    |   |    |
| British, cake and ingot    | ton | 44 | 0  | 0 | 45 |
| Best selected              | ton | 46 | 0  | 0 | 0  |
| Sheets, strong             | ton | 51 | 0  | 0 | 63 |
| Australian                 | ton | 0  | 0  | 0 | 0  |
| Club, bars                 | ton | 37 | 10 | 0 | 0  |
| Yellow Metal               | lb. | 0  | 0  | 5 | 0  |
| Sheet, English             | ton | 13 | 10 | 0 | 14 |
| SPRINGS—                   |     |    |    |   |    |
| Edison, special            | ton | 17 | 10 | 0 | 17 |
| Ordinary brands            | ton | 17 | 7  | 0 | 17 |
| Tin—                       |     |    |    |   |    |
| Banco                      | ton | 84 | 0  | 0 | 0  |
| Billion                    | ton | 83 | 0  | 0 | 0  |
| Strata                     | ton | 82 | 0  | 0 | 0  |
| Australian                 | ton | 83 | 0  | 0 | 0  |
| English Ingots             | ton | 85 | 0  | 0 | 0  |
| Zinc—English sheet         | ton | 21 | 0  | 0 | 22 |

## OILS.

|                     |        |    |    |   |    |
|---------------------|--------|----|----|---|----|
| Lined               | ton    | 18 | 10 | 0 | 18 |
| Cocanut, Ceylon     | ton    | 27 | 0  | 0 | 23 |
| Ceylon              | ton    | 25 | 10 | 0 | 0  |
| Palm, Lagos         | ton    | 24 | 10 | 0 | 25 |
| Bespiced            | ton    | 27 | 10 | 0 | 0  |
| do. brown           | ton    | 25 | 10 | 0 | 0  |
| Cottonseed, refined | ton    | 24 | 5  | 0 | 25 |
| Tallow and Oleine   | ton    | 19 | 0  | 0 | 45 |
| Lubricating, U.S.   | ton    | 5  | 0  | 0 | 0  |
| do. red             | ton    | 7  | 0  | 0 | 12 |
| Tax—Stockholm       | barrel | 1  | 2  | 0 | 1  |
| Archangel           | barrel | 0  | 14 | 0 | 15 |

HALIFAX.—Accepted for erecting five middle-class houses, Heath-avenue, Halifax. Mr. T. Lister Patchett, architect, Halifax. Quantities by architect—

## Mason and Bricklayer.

Thos. Mitchell, Warley, near Halifax, £1,370 0 0

## Carpenter and Joiner.

A. E. Anthony & Bros., Eastwood ..... 693 0 0

## Plumbers and Glaziers.

Jonas Alderson & Sons, Luddendenfoot ..... 190 0 0

## Slater and Plasterer.

John Robinson, Luddendenfoot ..... 280 0 0

N.B.—Fencing, laying out grounds, fixtures, gas-fittings, and painting, not let.

LONDON.—For the repair of a portion of the pitching in Caledonian-road, for the Vestry of St. Mary, Islington. Mr. J. P. Barber, C.E., surveyor—

|                          |             |
|--------------------------|-------------|
| P. Aspinall & Son        | £2,380 14 8 |
| G. Ratty                 | 3,427 0 0   |
| Mowlem & Co.             | 3,077 14 6  |
| J. Biggs                 | 3,061 13 8  |
| Wm. Griffiths (accepted) | 2,752 11 8  |

LONDON.—For erecting factory, dwelling-houses, &c., Queen's-road, Battersea, S.W., for Messrs. Bloomfield Bros. & Co. Mr. Hugh J. Curley, architect. Quantities by Mr. Thos. Masses—

## Factories, Fittings, Houses, Yards, Total.

|                 |       |     |       |
|-----------------|-------|-----|-------|
| Patman & Fother | £     | £   | £     |
| Ingham          | 6,034 | 569 | 1,120 |
| G. Stephenson   | 6,005 | 648 | 1,113 |
| Prentiss & Co.  | 5,842 | 539 | 1,042 |
| Kirk & Randall  | 5,755 | 525 | 980   |
| Coulson Bros.   | 5,678 | 513 | 913   |
| W. Downes       | 5,615 | 552 | 894   |
| W. & H. Castle  | 5,590 | 557 | 840   |
| H. L. Holloway  | 5,500 | 530 | 853   |

LONDON.—For the erection of two houses, stables, coachhouses, and workshops over, for Mr. J. Garner, Mansford-street, Bethnal-green, E. Mr. J. G. Needham, architect—

|                    |            |
|--------------------|------------|
| Look               | £1,594 0 0 |
| Walker             | 1,530 0 0  |
| Burgess            | 1,479 0 0  |
| Colwell Bros.      | 1,364 0 0  |
| Irry               | 1,225 0 0  |
| Winkley (accepted) | 925 0 0    |

LONDON.—For alterations and additions to the "Blue Anchor" tavern, York-street, Westminster, for Mr. Charles S. Pina. Mr. John Cox Dear, architect, 150, Southampton-row—

|               |            |
|---------------|------------|
| Burnan        | £1,480 0 0 |
| Spencer & Co. | 1,420 0 0  |
| Tyerman       | 1,380 0 0  |
| Sharp         | 1,300 0 0  |
| Lascelles     | 1,288 0 0  |
| Drew & Co.    | 1,271 0 0  |
| J. Chapell    | 1,268 0 0  |
| J. Beale      | 1,207 0 0  |

LONDON.—For proposed decorations, &c., to the "Castle" public-house, No. 28, Castle-street, Regent-street, for Mr. James Henderson. Messrs. Bird & Walters, architects—

|                 |          |
|-----------------|----------|
| F. Marks        | £403 0 0 |
| Lauregic & Sons | 401 12 4 |
| J. Years & Co.  | 401 12 4 |
| Hewitt          | 287 0 0  |

LONDON.—For alterations, repairs, and decorations to the "Bedford Head," Covent-garden, for Mr. W. Lindsay. Mr. H. E. Pollard, architect—

|                           |          |
|---------------------------|----------|
| Jackson & Todd            | £769 0 0 |
| Howard & Co.              | 750 0 0  |
| J. Years & Co. (accepted) | 720 0 0  |

LONDON.—For repairs, alterations, and additions at No. 3, St. Paul's-churchyard, E.C., for Mr. E. A. Bar—

|                           |          |
|---------------------------|----------|
| Smith                     | £785 0 0 |
| F. Foxley & Co.           | 777 0 0  |
| J. Years & Co. (accepted) | 730 0 0  |

LONDON.—For works to be done at St. Bartholomew's Church, Moor-lane, Cripplegate, City—disinfecting and cleaning interior nave and decorations to chancel. Mr. Randolph Payne, architect, 2, Noel-street, Colerbrook-row, N.—

|                   |          |
|-------------------|----------|
| J. Lidstone & Son | £107 0 0 |
| J. Grover & Son   | 102 10 0 |
| Oakley & Co.      | 95 0 0   |

LONDON.—For building additional buildings to St. Olave's Model Dwellings, Walnut Tree-walk, Lambeth, for Mr. A. Mackenzie. Messrs. Stock, Page, & Stock, architects, 9, Denham-street, London Bridge—

|                                   |            |
|-----------------------------------|------------|
| J. Beale, Westminster Bridge-road | £2,344 0 0 |
| [No competition.]                 |            |

LONDON.—For building new factory in rear of Nos. 181, 183, and 185, Upper Kennington-lane, for Messrs. Brine Brothers. Mr. John A. J. Woodward, architect, 10, Crown-buildings, Kennington Oval—

|           |          |
|-----------|----------|
| Greenwood | £235 0 0 |
| Tyerman   | 535 0 0  |
| Smith     | 533 0 0  |
| Hooper    | 511 0 0  |
| J. Beale  | 503 0 0  |

PLAISTOW.—For the erection and completion of factory premises, chimney-shaft, &c., at Butchers-bedge-lane, Plaistow, West Ham, Essex, for Messrs. W. Goodacre & Sons. Mr. Thomas Fletcher, architect, 73, Bow-road, E.—

|              |            |
|--------------|------------|
| A. Read      | £9,676 0 0 |
| Nightingale  | 8,943 0 0  |
| Peto Bros.   | 8,698 0 0  |
| Lascelles    | 8,500 0 0  |
| Harle & Son  | 8,370 0 0  |
| J. Morter    | 8,143 0 0  |
| Perry & Co.  | 8,073 0 0  |
| J. R. Hunt   | 8,016 0 0  |
| Cox          | 7,900 0 0  |
| Higgs        | 7,501 0 0  |
| Walker       | 7,870 0 0  |
| Shurmer      | 7,677 0 0  |
| Gentry       | 7,585 0 0  |
| Norton & Son | 7,387 0 0  |

## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.               | By whom Required.     | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|---------------------------------------------|-----------------------|-----------------------------------|--------------------------|-------|
| Removal of Road Sweepings & Street Watering | Hackney Bd. of Works  | J. Lovegrove                      | April 30th               | ii.   |
| Broken Granite                              | Gravesend U. S. A.    | Official                          | May 4th                  | ii.   |
| James Bellist Sand, and Cement              | L. B. & S. C. Ry. Co. | C. H. Oough                       | May 6th                  | x.    |
| Wood Paving Blocks                          | Paddington Vestry     | Official                          | do.                      | x.    |
| few Sorting Office, Acton                   | Com. of H.M. Works    | do.                               | May 7th                  | x.    |
| various Cleansing, &c., Works               | Poplar & Stepney St.  | do.                               | do.                      | ii.   |
| Asylum District                             | A. & C. Harston       | do.                               | do.                      | ii.   |
| Lepton Local Board                          | W. Dawson             | do.                               | do.                      | x.    |
| Elton Union                                 | Official              | do.                               | do.                      | ii.   |
| Hammermith Vestry                           | H. Hair               | do.                               | May 8th                  | ii.   |
| Borough of Salford                          | do.                   | do.                               | May 9th                  | ii.   |
| Brighton Town Council                       | G. R. Andrews         | do.                               | do.                      | ii.   |
| Barking Town Loc. Bd.                       | Bundell & Dawson      | do.                               | do.                      | x.    |
| Levensham Bd. of Wks.                       | Official              | do.                               | do.                      | x.    |
| do.                                         | do.                   | do.                               | do.                      | x.    |
| do.                                         | do.                   | do.                               | do.                      | x.    |
| Corporation of London                       | J. Wolfe Barry        | do.                               | May 10th                 | ii.   |
| Whitfield Local Board                       | C. Claude Robson      | do.                               | May 14th                 | x.    |
| Great Western Ry. Co.                       | Official              | do.                               | do.                      | ii.   |
| London County Council                       | do.                   | do.                               | do.                      | x.    |
| West Ham Council                            | L. Angell             | do.                               | do.                      | xi.   |
| Fulham Vestry                               | J. P. Norris          | do.                               | May 15th                 | x.    |
| do.                                         | do.                   | do.                               | do.                      | x.    |
| Richmond Union                              | F. Wentworth-Shields  | do.                               | May 20th                 | ii.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.                      | By whom Advertised.    | Salary. | Applications to be in. | Page. |
|---------------------------------------------|------------------------|---------|------------------------|-------|
| Superintendent of Sewerage and Outfall Wks. | Finchley Local Board   | 12l.    | April 29th             | xvi.  |
| Building Inspector                          | Sheffield Highway Com. | 30l.    | May 8th                | xvi.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                          |            |
|------------------------------------------------------------------------------------------------------------------------------------------|------------|
| CHESHAM (Bucks).—For erecting shoe factory and houses at Chesham, Bucks, for Messrs. J. & G. Barnes. Mr. W. H. Syme, architect, Watford— |            |
| Bates, Chislewood                                                                                                                        | £3,027 0 0 |
| Kingerlee, Oxford                                                                                                                        | 2,919 0 0  |
| Turner, Watford                                                                                                                          | 2,795 0 0  |
| Waterman, Watford                                                                                                                        | 2,717 0 0  |
| Homer, Pining                                                                                                                            | 2,677 10 0 |
| Harding, Chesham                                                                                                                         | 2,510 0 0  |
| Mead, Chesham (accepted)                                                                                                                 | 2,185 0 0  |

|                                                                                                                                            |          |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------|
| CROYDON.—For sundry repairs at 72, Wollsey-st., Croydon, for Mr. C. R. Roper. Mr. Francis A. R. Willey, architect, 68, Ludgate-hill, E.C.— |          |
| Rowe, Clapham-road                                                                                                                         | £108 0 0 |
| T. Barton, Croydon                                                                                                                         | 73 0 0   |
| A. Ackers, South Norwood                                                                                                                   | 68 0 0   |
| A. Lincoln, 237, Lornal-road, W.                                                                                                           | 60 0 0   |
| * Accepted.                                                                                                                                |          |

|                                                                                                                              |        |
|------------------------------------------------------------------------------------------------------------------------------|--------|
| DARTFORD.—For erecting Almshouses for the Trustees. Mr. John Johnson, A.R.I.B.A., architect, 9, Queen Victoria-street, E.C.— |        |
| Simpson                                                                                                                      | £1,510 |
| Dove Bros.                                                                                                                   | 1,455  |
| Archer                                                                                                                       | 1,410  |
| Bullock                                                                                                                      | 1,385  |
| Walls                                                                                                                        | 1,375  |
| Knight                                                                                                                       | 1,360  |
| King Bros. & Co., South Norwood                                                                                              | 1,290  |
| * Accepted.                                                                                                                  |        |

FAIRING.—For sundry works to be executed at Warden Villa, Uxbridge-road, Ealing, including the erection of a billiard room at the rear, for the Ealing Constitutional Club Company. Mr. Robert Willey, architect, 68, Ludgate-hill, London, E.C.—

|                  |           |
|------------------|-----------|
| Groves           | £362 10 0 |
| Myring           | 825 0 0   |
| Spackman         | 811 0 0   |
| Alamson & Son    | 810 0 0   |
| James            | 790 0 0   |
| Down (accepted)  | 645 0 0   |
| [All of Faling.] |           |

GREAT STAMFORD.—For additions and alterations to The Warren, Great Stamford, Middlesex, for Mr. Charles Keyser. Mr. W. H. Syme, architect, Watford—

|                                                    |            |
|----------------------------------------------------|------------|
| Messrs. Kirby & Sons, Great Stamford (approximate) | £1,000 0 0 |
|----------------------------------------------------|------------|

GREENWICH.—For additions and alterations at the Fire Brigade station, Greenwich, for the London County Council—

|                |           |
|----------------|-----------|
| C. Robson      | £317 12 0 |
| Simpson & Co.  | 310 0 0   |
| H. J. Stephens | 303 0 0   |
| F. P. Smith    | 297 0 0   |
| Gerrans        | 284 10 0  |
| Holloway       | 274 0 0   |
| W. & E. Mills  | 270 0 0   |

ISLEWORTH.—For the erection of a pair of semi-detached villas, on the Spring Grove Estate. Mr. Frederic W. Fryer, architect, 51, Cannon-street, E.C.—

|                          |          |
|--------------------------|----------|
| Arthur Porter, Tottenham | £280 0 0 |
| [No competition.]        |          |

PLUMSTEAD.—For the erection and completion of chapel, waiting-rooms, lodge, entrance gates, &c., for the Plumstead Burial Board. Mr. H. H. Church, architect. Quantities by Mr. W. H. Strudwick:—

|                        |            |
|------------------------|------------|
| Mariott .....          | £5,293 0 0 |
| Chapman .....          | 5,189 0 0  |
| Holloway .....         | 4,879 0 0  |
| Staines & Son .....    | 4,525 0 0  |
| Batley .....           | 4,523 0 0  |
| Longley & Co. ....     | 4,560 0 0  |
| J. O. Richardson ..... | 4,339 0 0  |
| Kemp .....             | 4,068 0 0  |
| Proctor (accepted) ..  | 4,090 0 0  |
| Martin .....           | 3,988 0 0  |

READING.—For rebuilding the "Swan," St. Mary's Butte, and adjoining premises, for Messrs. Hawkins. Mr. Geo. W. Webb, architect, 14, Friar-street, Reading:—

|                               |            |
|-------------------------------|------------|
| Kingerlee, Oxford .....       | £2,697 0 0 |
| Searle, Reading .....         | 2,333 0 0  |
| Margetta, Reading .....       | 2,287 0 0  |
| Collier & Ostley, Reading ..  | 2,247 0 0  |
| G. Lewis, Reading .....       | 2,230 0 0  |
| Silver & Sons, Maidenhead ..  | 2,225 0 0  |
| Higgs & Son, Reading .....    | 2,219 0 0  |
| Bottrill & Son, Reading ..... | 2,175 0 0  |

READING.—For alterations to three houses in the King's-road, for Capt. Frederick Stephens. Mr. Geo. W. Webb, architect, 14, Friar-street, Reading:—

|                               |          |
|-------------------------------|----------|
| Searle, Reading (accepted) .. | £430 0 0 |
|-------------------------------|----------|

ST. ALBANS.—For new roads at Bedford Park, St. Albans, Herts. Mr. R. A. Hill, surveyor, St. Leonard's-on-Sea:—

|                             |          |
|-----------------------------|----------|
| Trickett (Millwall) .....   | £295 0 0 |
| Simpson (Bow) .....         | 800 0 0  |
| Miskin .....                | 712 0 0  |
| Haselgrove .....            | 639 0 0  |
| Rutty (Bouley-by-Sea) ..... | 600 0 0  |
| Dickson .....               | 607 0 0  |
| Capper .....                | 477 10 5 |

WARGRAVE.—For additions, &c., to the "George and Dragon" Hotel, for Messrs. Hawkins. Mr. Geo. W. Webb, architect, 14, Friar-street, Reading:—

|                                 |            |
|---------------------------------|------------|
| Cox, Maidenhead .....           | £1,195 0 0 |
| Goodchild, Reading .....        | 1,030 0 0  |
| Kingerlee, Oxford .....         | 1,437 0 0  |
| Clements, Henley-on-Thames ..   | 1,049 0 0  |
| Weyman, Henley-on-Thames ..     | 1,029 0 0  |
| Messelwhite, Reading .....      | 886 0 0    |
| Bottrill, Reading .....         | 857 0 0    |
| Silver & Sons, Maidenhead ..    | 984 0 0    |
| Simmonds & Son, Reading .....   | 975 0 0    |
| G. Lewis, Reading (accepted) .. |            |

WARGRAVE.—For new tea-room and additions to buildings, for Mr. Charles Crocker. Mr. Geo. W. Webb, architect, 14, Friar-street, Reading:—

|                                    |          |
|------------------------------------|----------|
| J. Farrist, Wargrave (accepted) .. | £375 0 0 |
|------------------------------------|----------|

WATFORD.—For additions to the Watford Public Library. Mr. W. H. Syne, architect, Watford:—

|                        |          |
|------------------------|----------|
| Nesb .....             | £710 0 0 |
| Dove .....             | 657 10 0 |
| Clifford & Gough ..... | 645 0 0  |
| Waterman .....         | 645 0 0  |
| Turner, Limited .....  | 688 0 0  |
| Andrews & Sons .....   | 582 0 0  |
| Judge & Eames .....    | 510 0 0  |
| Wiggs (accepted) ..... | 485 10 0 |

[All of Watford.]

WATFORD (Herts).—For alterations at No. 49, High-street, for Mr. S. H. Timms. Mr. O. P. Ayres, architect, Watford:—

|                               |          |
|-------------------------------|----------|
| Judge & Eames .....           | £495 0 0 |
| Andrews .....                 | 396 0 0  |
| Waterman .....                | 334 0 0  |
| Clifford & Gough .....        | 337 0 0  |
| T. Turner, Ltd. (accepted) .. | 326 0 0  |

Industrial Dwellings, Bethnal Green.—In last week's issue of the Builder we published a list of tenders for Industrial Dwellings in Brady-street, Whitechapel, stating that the quantities were taken out by "F. J. Green & Petersen." It should have been T. Thornton Green & Petersen.

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# The Builder.

VOL. LVI. No. 2413.

SATURDAY, MAY 4, 1899.

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### Architecture at the Royal Academy and at the Salon.



THE Architectural Room at the Royal Academy contains a large proportion of good drawings, as far as draughtsmanship and effect go, for this ornamental portion of architectural art is so much improved and developed of late years, that it could be strange indeed if one moderately fitted room could not be filled annually with at least good drawings of architecture. The collection is, however, of less interest than last year, from the want of leading works; there is nothing to turn to as the central feature, but rather a collection of drawings of a very varied nature and of which no sample or no group can be said to be decisively predominant. The appearance of the room is not what it was last year, in decorative sense, for there are no such large and powerful decorative studies as Mr. Eaton's, for instance, to give brilliancy and colour to the room. Nor is there any predominant tendency, among the designs shown, towards any special school or treatment of architecture. The stranger from a far country, entering this room, would be utterly puzzled to decide what was the prevalent architectural taste of the country in which he had found himself. He would see Gothic and Queen Anne and Renaissance side by side, with no evidence that there is much to choose between them according to the taste and critical opinion of the moment; it seems to be as haphazard a matter as the grouping of the drawings, which seem to be placed anyhow without regard to style or purpose or value.

It is a motley collection of drawings, mostly one or less meritorious, but generally small and often sketchy and picturesque, and such as has not cost much more than draughtsmanship to produce. There is nothing to be seen in the Academy like the learned and elaborate studies of restoration of ancient buildings, for instance, which are seen at the Salon; and if it be said that these are unpractical and even in some sort pedantic, they represent a side in the study and illustration of architecture which we in England seem nearly to ignore, in our exhibitions of drawings at least, and some of them represent a degree of study

and knowledge which is not often represented in the Academy architectural room. Here, indeed, it seems sufficient that a work has been executed, and is decently drawn, to secure it a place. At the Salon the intellectual training indicated by a drawing, even of a purely ideal restoration, goes for something.

As to the various ways of drawing that are employed, a look round the collection shows that pen-and-ink line drawing still holds its own as the favourite method of giving picturesque representations of architecture. As this is a branch of art especially demanding precise delineation of detail, it is obvious that the details are more entirely in the draughtsman's hands, if he have time and patience to give to them, than in any means of execution by brushwork, which is less the servant and more the master of the draughtsman, in regard to detail especially. Pure water-colour painting is only employed in a few cases, but it must be admitted that these include some of the best drawings in the room. Brown ink line drawing, further sanctified by washes of brown for broad shadows, is a means of representation which offers great attractions to some of the best draughtsmen who exhibit, as shown in Nos. 1854, 1887, 1924, 1966, and 1970. One or two of these exhibit that taste for leaving large spaces of untouched white in a drawing which the Americans have to a great extent brought into fashion, and which contributes strongly, no doubt, to giving brightness and glancing effect to a drawing, but which, like many other little discoveries in the way of effective architectural drawing, is rapidly degenerating into a sleight-of-hand which any one who is not thoroughly stupid can acquire and imitate. In regard to the pen-line drawings, we may observe, there is plenty of evidence of the progress made in artistic feeling and effect in this class of drawing of late years; the old school of hard and precise drawings of perspectives in pen line would not be tolerated now, and we find hatched pen drawings, such as Mr. Bidlake's church, No. 1869, which have almost the breadth and brilliancy of water-colour. Of pencil drawing, a medium which has received a little more attention lately, there are not many examples in this exhibition; one of the best is a sketch by Mr. H. Wilson of a corner of Canterbury Cathedral, the N.W. angle of the transept (1881), in which however that habit of stopping short the lines of light or shadow, and showing the extremities of them only, which has become (like leaving white spaces)

a fashion in draughtsmanship, is carried to excess, and gives a too spotty effect to the drawing. Mr. Mallows' drawing in the cloisters of Gloucester Cathedral is a good example of pencil drawing of a quieter style. No. 1872 is, as far as we have observed, a solitary specimen of the class of elevation conventionally shaded with the brush, in which the French delight, and which has its merits, though it is apt to seem cold and mechanical beside the best of our more picturesque English drawings. Of geometrical elevations there are very few in the exhibition, and we have always regretted that there is not in the Academy architectural room a larger proportion of this more truly architectural manner of exhibiting designs, and less of mere picturesque drawing. Among the few elevations are two very agreeable geometrical coloured drawings of a brick house, by Mr. Wade (1825, 1833) to which we will refer more in detail subsequently; 1845, by Mr. Hilton Nash is another; and Mr. Arthur E. Street exhibits an important set of geometrical drawings of his "Halifax Cathedral, Nova Scotia." Two large geometrical pen drawings of competition elevations for Edinburgh municipal buildings are exhibited (1908 and 1925), but, though in good taste (except the tower, which is very poor) these certainly do not present any force or originality such as could explain their prominent position in the hanging, and they are unaccompanied by plans, which would have enabled one to understand their merits better. Plan seems at first glance to be almost entirely neglected in the exhibition; we find however that out of the 199 exhibitors in the architectural room, thirty-two have added plans of some kind to their drawings (sometimes only block plans), so that this important element in architectural design has received some little recognition.

If we had to fix upon any one drawing as the central exhibit of the year, we should select Professor Aitchison's richly coloured perspective view of the restored interior of the Tepidarium of Caracalla's Thermæ (1864), which hangs appropriately in the centre of the east wall, and forms a very interesting pendant to his remarkable series of lectures on Roman architecture of this class, which have recently been fully reported in our columns. This is a view taken looking down the centre of the great hall, roofed with the stilted and ribless vault of the Roman architects, the surfaces being covered with



gold arabesques (as they would now be called) on a deep blue ground, giving an almost Oriental richness of effect. The vault springs from great columns on each side, alternately of a red and a yellow veined marble, the colour effect and texture of which are shown with great care; these carry white marble Corinthian capitals with the usual slice of architrave also in white marble, which is very much toned down in the drawing, however, not being seen in full light, and therefore does not obtrude itself so much in contrast to the richly-coloured materials of the other portion as might otherwise have been the case. Opposite the eye is seen the entry into the further apartments, though a screen of much smaller columns of red marble, with an architrave and a relieving arch over. The floor is laid in bands and large squares of variously coloured marbles. The whole thing is very rich and effective, and a very fine specimen of architectural drawing in water-colour. Near this hangs Mr. Daniel Brade's perspective view of his competition design for the façade of Milan Cathedral (1855), a pencil drawing lightly tinted, with a blue sky above; by an oversight in colouring, the same blue of about the same intensity is used on the lights of the large mullioned and traceried window which forms the central feature, the result of which is that we seem to look through the façade as if it were only a skeleton building. Otherwise this is a fine drawing and in many respects a fine design, though far too English for the situation. There are five portals, a large central one and two subordinate ones on each side; the central mass is flanked by great buttresses square on plan which rise into spirals on each side of the gable; the great central arch, within which is the west window, is much stilted above what should be the springing line judging from the treatment of the adjoining portions, an effect which is not very satisfactory to the eye. There is a tower at each extremity of the façade, with a recessed portion between it and the centre with two subordinate gables, answering to the two portals below. The details are generally in a very good style of Gothic; much better, admittedly, than that of the bulk of the cathedral. It seems rather a mistake, however, to have treated some of the arcades in the upper portion with such large foliations of the plate-tracery order; the chord of each of the two curves of the foliation must, to judge from the scale of the figures in the drawing, be at least 5 ft., and these details tend to lessen the scale of the front, which is nevertheless a fine conception, and one of which its author may be proud.

Mr. Henry Holiday contributes a beautiful piece of decorative design, "Of such is the Kingdom of Heaven" (1824), by far the most important thing of this class in the room, and which ought to have had a more central position. It is in five compartments, a wide one with two narrow ones on each side; in the centre is Christ enthroned, a woman with an infant on one side and one leading an older child on the other side; a rainbow and flying angels fill up the composition above, and below a river issues from beneath the throne and flows from right to left as the base of the whole composition. From each side beautiful and graceful angel figures approach with children.

It may be instructive to compare this fine and intellectual allegory with Mr. Strudwick's piece of Mediæval childishness in the New Gallery, to which reference is made in another column. The drawing is in light-red crayon, with blue for the river and the portions of sky above, and a very delicate blue for the foliage. We take it however that this drawing is in the nature of a cartoon, and does not represent the colour in which the work would be carried out.

Among the more noteworthy drawings is the first in the collection, Mr. Sedding's geometrical drawing of one bay of the nave of the church in Sloane-street. This is a line drawing mostly in brown ink, with a little touch of colour on the upper portion of the windows to indicate the effect intended on the glass. The ground story windows are circular-

headed, with five lights, with tracery in Perpendicular style or nearly so (for this is not a mere reproduction of Gothic details); above it two stringcourses mark off a space which forms a kind of frieze with paintings on it; these are drawn and shaded in line and give no indication of colour or material. Above this the bay is occupied by a narrow two-light clearstory window with blank wall on either hand. On the lower part of the piers are statues (bronze?) under canopies. This is a very original piece of work; it would have been more thoroughly intelligible if a plan of the bay had been added.

The centre of the south wall is occupied by Mr. Waterhouse's Hotel Métropole for Brighton (1917), a large red building, but whether brick or terra-cotta appears not very clearly. His most important contribution however is "Liverpool University College—Brownlow-street Front" (1902), which we believe is a terra-cotta-faced building. This is a very picturesque composition. One third from the right hand end of the elevation rises a large square tower corbelled out for a great clock stage above; to right of this is the staircase, shown outwardly by the position of the windows; this wing, beyond the staircase, is produced to an octagon at the angle, but filled up by a smaller circular tower with a conical roof. This portion of the building is very massive in appearance, each bay being divided by an octagonal buttress finishing above the roof-line in a kind of stump, with no ornament. On the other side of the great tower everything is changed; the building is lower and with a more domestic character, a straight cornice interrupted by three small gables, and below these a continuous line of arcading partially pierced for windows, partially solid. Below this, between gabled projections, are large pointed windows in two lights, below again square-headed windows. A massive stone (or granite?) plinth, about six feet high, forms a base to the whole composition and binds it together. This is one of Mr. Waterhouse's most successful and picturesque designs.

This is picturesqueness within strictly architectural and formal lines; some of the best drawings in the room illustrate the tendency of the day to seek for effect by what may be called the heaping up of buildings rather than designing them. Mr. Pryce's exceedingly picturesque "Church at Barmouth" (1921) is an example of this; it is on a steep and hilly site, it must be admitted, which gives a kind of excuse for this kind of treatment. Mr. Belcher sends an extraordinary and most original design for a church at Maida Hill (1928), which certainly has the merit of being like nothing one has seen before. This and others we shall have the opportunity of describing more in detail in subsequent notices. Among other drawings that are prominent may be just mentioned now Mr. Stokes's "St. Clare's Church, Sefton Park, Liverpool" (1910, 1913), the interior of which we illustrate this week. Mr. Robson sends an interior view of the Reading-room at the People's Palace; Mr. T. G. Jackson a view of the Campanile at Zara (1878) and a drawing of the fine tower which he proposes for St. John the Baptist, Wimbledon (1849); Mr. Jas. Brooks is represented by two of his Liverpool Cathedral drawings, an interior of the Church of the Good Shepherd at Hampstead (1926), and a large design for a house at Rondebosch, Cape Town (1907); Mr. Pearson is represented by a drawing of his new buildings for the University Library Cambridge (1907); Professor Aitchison contributes decorative work in the shape of designs for the wall and for the ceiling of a billiard-room (1852, 1879). These and others we will speak more particularly of hereafter; but we will devote our further remarks at present to the kindred exhibition at the Paris Salon, to which we may not have the opportunity of returning in detail.

The universal Exhibition, which will open almost at the same time as the Salon, will be no little injury to the latter, financially and otherwise, though the Salon is not in a general

way inferior to that of last year, and the architectural department, though perhaps presenting no very remarkable works, is of considerable interest.

As this year is the centenary of the Revolution, which is in fact the *raison d'être* of the great Exhibition, one is naturally led to speak first of the designs which are exhibited for the monument which is to recall this historical epoch, and which it is proposed to erect to the Place du Carrousel. The subject ought to prove a sufficiently suggestive one, though it can hardly be said that any one of the exhibitors of designs for this object have fairly risen to the occasion.

First come four frames of drawings by M. Lheureux, a fine draughtsman who has more over paid much attention to decorative detail, but he has hardly hit the mark here. In the centre of the Place du Carrousel he raises a quadrangular pyramid relieved with porticoes, colonnades and statues, surmounted by a spherical cupola carrying a colossal group of sculpture. Imagine this central part surrounded by lateral porticoes surmounted by statues in gilt bronze, and you have an imperfect idea of a design the general appearance of which at a distance recalls a Hindû temple, or perhaps more nearly resembles some of those constructions in sugar on which the confectioners pride themselves. The section shows an internal luxuriance of bas-reliefs and frescoes representing or symbolising scenes in the Revolution, in which the costumes do not lend themselves very well to a design which in its main lines is rather antique than modern.

The design by M. Bruneau is much better if not an ideal one. In the midst of porticoes which support statues of celebrated personages rises an immense central pavilion with openings on each face and surmounted by a solid monumental-looking dome, which is crowned by a group in gilt bronze. The design however, which is continued by colonnades extended right and left, has little architectural relation with the buildings of the Tuilleries and the Louvre, the existence of which, in fact, though they form the framework of the whole scene, seems entirely forgotten in most of the designs. The design by M. Lovio resuscitates the old and one would have thought exploded fallacy of a colossal Corinthian column carrying a statue, and resting on a base with a colonnade in front of it supporting a pediment; the whole presenting vaguely the idea of the Madeleine serving for the basement of the Vendôme column a good deal magnified. M. Lovio, however, makes amends in his Girondin monument, of which the plaster model is exhibited. On a circular subbase ornamented with a triglyph frieze and with metopes bearing the names of the Girondins who were victims of the Revolution, is a pedestal also circular, covered with inscriptions, on which is a figure of the Republic holding a banner; around the base are seated statues symbolising Liberty, Instruction, La Gironde, &c. All the sculptural portion, designed and executed by M. Cordonnier, is fine in character and design.

M. Dutocq, whom we meet again further on with a design for a mairie at Lyons, exhibits in conjunction with M. Gaudex a design for a monument to be erected at Lyons "à la gloire de la République," in which he seems to have been considerably haunted by the recollection of the monument in the Place de la République at Paris. The statue, holding an olive bough, is a reproduction of that of M. Morice, and on the base is a figure of a seated warrior with a remarkable family resemblance to one of the figures by M. Dubou which adorns the monument of Lamoricière at Nantes.

To say truth, among these various more or less grandiose monumental "projets" one alone seems to us to be happily conceived, that which M. Boileau, the clever architect of the "Bon Marché," has designed as a monument to M. Boucicaut, the foundress of that well-known establishment; a design unpretending and very satisfactory in effect. A square base supports a pyramid of the same plan surmounted by a figure of "Genius." At the



base of the pyramid a seated female figure holds a medallion of Madame Boucicaut on which a little child places a garland. We may notice also among the class of monuments, as worth mention, a fountain erected at Bayeux (Calvados) from the designs of M. Genuys, and which he terms specially a "decorative" fountain, though some of the details hardly bear out this expression.

The sketches of travelling sketchers are not so numerous as usual this year, and among those that are exhibited there are few of the right kind, few of those lightly-touched impressions of travel finished on the spot, which when adequately handled represent the perfection of architectural sketching. It must be admitted, however, that many of the works of this class, which used to be much more numerous, would find their proper place in the watercolour room rather than in the architectural collection, and as they stand in the way of the adequate illustration of architecture proper, it is perhaps as well that they are less in evidence than formerly. Among the number M. Ghesquier, who illustrated Spain for us last year, exhibits a pretty water-colour drawing of the Hôtel de Ville at Loos; M. Clausse has some rather rough-and-tumble sketches of Cordova and Grenada; M. Goutier shows us the interior of St. Sophia depicted with precision and hardness; very hard also are the sketches done during a tour in the East, by M. Graff. We may notice for special praise the sketches by Mr. Whitney Warren, in Holland and in France, slight in execution but showing much taste and ability. M. Gouvens has this year confined himself to Paris, and given us a series of very pretty sketches of the Seine bridges from Bercy to Auteuil. We may also notice the water-colours in which M. Villeville has made a special feature of views of Fontainebleau, and the views of the church of St. Mark at Venice by M. Charles Normand, the young and zealous secretary of the Société des Amis des Monuments Parisiens.

Restorations of ancient monuments occupy a considerable place this year. In this class of works the contribution of M. Paul Esquié is the leading architectural work of the Salon. This young architect has chosen as his subject the restoration of the sumptuous buildings which the Emperor Hadrian constructed at Tibur, now Tivoli, the scene over which Horace lingers so lovingly. The great "villa" of Hadrian was supposed to have been enclosed, within a circuit of ten miles round, a kind of abridgment of the wonders of the then known world. There was to be seen within its limits the Pœclie at Athens, the Vale of Tempe &c.; it had its baths quarter, that of the theatres, that of the temples, and so on. The remains of these which still exist on the side of thickly-wooded hills have been shown by M. Esquié in a drawing which may almost be called a landscape, treated in a broad and monumental fashion. The restoration of the north-west façade of the villa is very remarkable, showing the greatest delicacy of detail, drawing and colouring, especially in the portion where the gallery of the basement is seen through the galleries which are in strong sunlight, and of which the decorative features are beautifully indicated. Above the courts and walled gardens rise a crowd of statues forming the sculptural decorations of the porticoes, and rising above this mass of buildings of various outline are seen a high campanile and the dome of the Prytæneum. The drawings showing the section of the Nymphæum in its actual state, and the restored building with its fountains, its rich interior decoration, and its portals veiled by hangings, are also remarkably fine. In this extremely interesting collection of drawings M. Esquié has given proof both of talent and learning.

The drawings of M. Redon also exhibit knowledge of his subject and great power of draughtsmanship. Those of the Temple of Concord (existing state and restoration) are executed in a very broad and powerful style. The restoration of the Villa Medici exhibits a great deal of fine detail drawn with great

precision. The drawings of the Temple of Rameses at Luxor, by M. Gayet, exhibit a complete knowledge of Egyptian architecture, though they have the defect of accentuating rather too strongly the brilliant but crude polychromy of the decoration.

M. Fournereau has devoted seven large frames of drawings to the restoration of the royal pagoda of Angkor-Vat. In this drawing there is an extraordinary entanglement of sections of mouldings and of all kinds of ornaments worked out in a most complete manner by M. Fournereau, who has contributed so much to bring to the knowledge of Europeans the characteristics of the architecture of Khmer and Cambodia.

Among the numerous restorations of the monuments of the Middle Ages and of the Renaissance we may mention that of a chimney-piece of the Henri II. period at Fontainebleau by M. A. Boitte, the restoration of an old and curious house at Brive by M. Gohier, and that of the apse of Notre Dame at Wassy (Haute-Marne) by M. Descaves, an important work executed for the Commission des Monuments Historiques. Nor must we omit to mention the four drawings by M. Lizain representing the restoration of the château of Vaux Prasin, the celebrated residence of Surintendant Fouquet.

There is no doubt that these archaeological studies, so much in vogue in France at present, exercise a considerable influence on the taste of the architects of the day; but in spite of these examples or ideals of grand work, it must be confessed that the majority of the modern church designs exhibited are remarkably feeble in style. Among a crowd of mediocrities in this part of the collection, we may single out as above the average a design by M. Paul Gout, the chapel of Notre Dame de Creisker at St. Pol de Léon (Finistère); and two other churches, that of Notre Dame de Prouille (Aube) by M. Saintpère, and that of L'Argentière, by M. Baussan.

Modern architecture, which begins of late years to take a more important place in the Salon, is represented this year by numerous drawings of which we have only space to mention a few of the principal ones.

The salle-à-manger of the Château de Gailletfontaine by M. Bir is decorative enough in effect though somewhat mannered. A better design is the billiard-room added by M. Dubois to an old house at Roubaix. M. Guillaume has shown, in a highly-finished water-colour drawing, an interior of the drawing-room in the villa of M. Faure, the eminent vocalist, at Etretat. M. Leidenfrost, who out of the old château of Léchelle de France has created the new Château de Beaumont, gives a fine view of this building in red brick, with high-pitched roofs, designed in the style of the Renaissance. M. Vandoyer's Château de la Garenne shows a picturesque combination of red brick with half-timber work. M. Antonin Durand has devoted himself to utilitarian architecture, in the shape of a "maison bourgeoise" which he has erected at Beziers, the ground-floor of which is occupied by a café, which would hardly be out of place in Paris, considering the style of its plastered façade.

Among buildings in the class of civil architecture we find three designs for a Mairie for the town of Calais, designs sent in a competition the result of which we have not heard. At any rate the design by M. Paul Wallon is a fine one in a broad and effective manner. That by M. Dutoq is also a meritorious design, and a good set-off against his monument for Lyons of which we have before spoken. M. Dutoq, whose design for the Mairie of Neuilly-sur-Seine has been published in the *Builder*, is a young architect who has probably a good future before him, possessing a knowledge of the practical requirements of many different classes of buildings, with considerable ability in decorative design. The third design is by M. Bernard, who also exhibits a competition design for the new Hôtel de Ville at Vincennes. These two designs do not seem equal to the occasion, and rather have the appearance of Mairies for a suburban quarter.

We come now to the Ecole des Beaux

Arts drawings, among which we may notice the design by M. Astruc for a large passenger railway-station arranged on the German system. It is a pupil's design prepared in competition for a diploma of the Ecole, but treated with much care, and showing that its author possesses a good deal of practical perception combined with the hand of an able draughtsman. A design for a theatre by M. Allorge is another of the diploma competition designs, well planned internally, with a façade which, though a little heavy, shows a simplicity of line and self-restraint in design rather rare in the designs of young students, who are generally disposed rather to exaggerate their exterior decoration.

A design for a circus for the town of Brussels by M. Dauvergne is worth attention; also a very original one by M. Trilhe for transforming into a concert promenade the large basin for the "distribution des eaux" at Ourey, situated on the boulevard de Batignolles, without reducing the required volume of water. The design, which shows a great deal of elegant polychromatic decoration, includes provision for a flower-market also. It has the merit that it would conceal, behind some graceful and picturesque structures, a very uninviting corner of Paris; but it is not likely that it will ever be executed.

We ought not to terminate this necessarily brief notice of the Paris architectural exhibits without a word on the designs which have relation to the Great Exhibition. They are not very numerous, and are mostly devoted to interior decorative treatment. Among them the more important are designs for a grand entrance to the principal gallery, by M. Bertrand; and a design for a "brasserie" restaurant in the Palais des Beaux-Arts, by M. Bisler.

On the whole it may be said that the architectural show at the Salon has in the main a character of praiseworthy mediocrity, always excepting the restoration of Hadrian's villa by M. Esquié, before named, which alone can be spoken of as a work of genius.

#### A BOOK ON STRATA FLORIDA.

**I**N the *Builder* for October 13 of last year we gave some account of the excavations that had been made on the site of the once-famous Abbey of Strata Florida in South Wales, something over twenty miles to the north-west of BUILT, the largest town in the district in which the Abbey was situated. The excavations were made under the direction of Mr. Stephen W. Williams, architect, whose interest was attracted to the ruins when making a survey of a proposed line of railway from Rhayader to Aberystwith about five and twenty years ago, and he then entertained the project of examining into the history of the Abbey and into the remains on the site. The excavations have been already made, and many details of the Abbey recovered, and in our former article we gave the plan as restored by Mr. Williams; an early transitional church with a short choir and three square chapels against the east wall of each transept. We also gave at the same time some sections of piers and mouldings.

The restored plan, which was shown complete on that occasion, is shown in Mr. Williams's book on the Abbey, now published, so shaded as to exhibit in black the portions which remain standing up to any considerable height, those of which there are distinct traces shaded, and those of which no remains exist white. There is, we are bound to say, very little black on this plan; only two-thirds of the west wall, and the north-west angle of the north transept. The main lines of the rest of the plan are however quite made out, so far as the church is concerned, the white portions here only consisting of some of the piers of the nave. A great many interesting pieces of detail have however been found,

\* "The Cistercian Abbey of Strata Florida: its history and an account of the excavations made on its site." By Stephen W. Williams, F.R.I.B.A. (London: Whiting & Co. 1888.)



and the plates we are enabled to give this week from the careful drawings made by Mr. Worthington G. Smith will show how singular is the detail of the west door, and that some other portions of the carved ornament discovered have, like many other specimens of Mediæval detail from Wales, a character of their own, quite distinct from what we usually meet with in the English counties. As may be seen from the details of carving given, as well as from others which we are unable to give, interlacing ornament is a decided tendency in the work of the men who built Strata Florida; the character, in short, is to a certain extent Celtic. The west doorway, with its mouldings tied up in bandages ending in scrolls, is anything but admirable to our thinking, but it is sufficiently curious and unusual to be well worth illustrating. The restored capital of the nave piers is based on the remains of a respond, giving the plan of the pier, and on various fragments which have been found. As we have not seen these, and they are not illustrated in the book, we can form no judgment as to the validity of the restoration, which forms a remarkable-looking capital, and if accepted as authentic, may be added to the various forms of transitional capital already in existence. There is, it will be observed, no necking to it. The bases of the pier shafts reposed on pedestals about 7 ft. high, as given in the restored elevation of the nave arcade, the pedestal being extended so as to be about 9 ft. wide in the longitudinal direction of the church, but transversely little wider than the pier above, or about 4 ft.

Mr. Williams devotes a considerable portion of his book to the history of the founders of the Abbey, in three chapters teeming with impossible-looking Welsh names, and of which the interest to the general reader will not we fear be very great, but it forms a useful archaeological record. We observe that it is stated that the Welsh Cistercians selected the wildest and most barren spots for their abbeys, in this respect hardly resembling their English brethren, who studied seclusion in their sites; but as seclusion was generally best obtained in a valley, they naturally attained, along with this object, that of repose and beauty of scenery.

The Cambrian Archaeological Society, which was founded in 1846, made Strata Florida one of the objects of its first annual meeting in 1847, when the pavement and existing walls were laid bare for their inspection, and several discoveries of tombstones, tiles, and various carved details were made on that occasion. Mr. Williams gives a drawing of a much dilapidated cup of no particular interest in regard to design, but which has for long been supposed to have miraculous qualities of curing diseases, and used to be lent to various afflicted persons in exchange for the deposit of money or valuables, to be returned on the receipt of the cup again. According to the author, this superstition is still flourishing among the people.

The recent more thorough excavations were made in 1887, and afforded Mr. Williams the opportunity of preparing a plan of the site. Traces of the action of fire were everywhere found on the building, fragments of charred wood and melted lead turned up among the debris. The walls had been plastered, and Mr. Williams thinks that after the fire in 1284 the monks whitewashed the walls to hide the traces of it, as fragments of mouldings were found with several coats of whitewash on them. We are told that four kinds of stone were used for the piers, a coarse hard sandstone, a fine-grained yellow sandstone (New Red), a purple sandstone of rather slaty texture, and an oolite, probably from Gloucestershire or Somersetshire. The stonework of the main walling as shown in the illustration of the west doorway is very rough, as will be seen, and suggests the conclusion that the exterior was plastered.

When the building has been cleared and properly fenced, a custodian is to be appointed to take charge of it, and probably more relics may be discovered eventually. Meanwhile

Mr. Williams's very complete account, in which we believe everything that has already been discovered is illustrated, may be recommended to the reader as an excellent archaeological monograph on the remains of a very remarkable and interesting ecclesiastical structure.

## NOTES.

**A**T the April meeting of the Berlin Archaeological Society, Dr. Furtwängler made some interesting remarks on the recently identified head of Eubuleus, by Praxiteles, to which, some time ago, we drew attention. He holds it not to be part of a statue, but to have been simply a bust. The idea of a bust is usually associated with Roman rather than Greek work, at least as regards the fourth century B.C. Dr. Furtwängler, however, points out that we have an analogy in the busts of the Dioscuri, on coins of Mantinea, of the fourth century B.C.; they are represented as placed on an altar table, and the same may have been the case with the Eubuleus head. Dr. Furtwängler claims to have arrived quite independently at the conclusion that the head in question was an original work by Praxiteles. Few will question his authority, and this double identification greatly strengthens the probability that the attribution is correct. At the same meeting he also drew attention, in speaking of a monograph by Dr. Hoffman, to the Stroganoff replica of the Apollo Belvidere. It will be remembered that Stephanii alleged that the Belvidere Apollo must be restored brandishing the regis, instead of drawing the bow. It now appears that the arm of the Stroganoff statuette, on which all this is based, is, according to the opinion of two specialists, falsely restored. It has belonged to a Hermes, and the supposed regis is a fragment of the purse so often held by Hermes in Roman statues. An account of the meeting, at which Dr. Furtwängler spoke, appears in the *Berliner Philologische Wochenschrift* April 27.

**I**N view of the forthcoming visit by the British Association to Newcastle-on-Tyne, some inhabitants have set up a "Memorial Tablet Fund" for the marking of certain houses in their midst which are associated with the boyhood or career of their most famous fellow townsmen. Amongst those worthies rank Mark Akenside, the poet (1721-1770), son of a butcher, who settled as a physician in London after graduating at Leyden in 1744; William, now Lord, Armstrong, who in 1846, being then thirty-six years of age, quitted the legal profession in order to establish the Elswick works; Thomas Bewick (1753-1828), born at Cherry Burn, in Ovingham, and apprenticed in his fifteenth year to Ralph Beilby, of Newcastle, engraver, with whom he subsequently became a partner; John Brand (1743-1806), antiquary, and historian of his native town and county, latterly rector of St. Mary-at-Hill, by Billingsgate; Cuthbert, Lord Collingwood (1750-1810), who commanded the *Royal Sovereign* at Trafalgar; Nicholas Durham, Wicliffe's adversary; William Elstob (1673-1714), sometime rector of St. Swithin with St. Mary Bothaw, London, learned in the Saxon tongue; Charles Hutton (1737-1823), son of a colliery viewer, the mathematician and civil engineer, by the illustration of whose work upon mensuration Bewick first came into notice; together with John, Earl of Eldon (1751-1838), Lord Chancellor, and William, Lord Stowell (1745-1836), sons of William Scott, a Newcastle factor or coal-fitter, who were born at Heworth, on Tyne-side, and received their early education in the Royal Free Grammar School at Newcastle.

**T**HE Garrick Theatre, of which we gave illustrations and some description in the *Builder* for June 30, 1888, and which has just been opened under the management of Mr. Hare, is planned by the same architect (Mr. Emden) and built on much the same general lines as the Court Theatre, but has great

advantages of situation, and is, on the whole, better arranged in regard to the position and planning of exits and entrances than the Court. Owing to the space at command it has been possible to arrange the standing-room for the *queues* (as the French call them) of pit and gallery audience in long passages completely shut out from interference with public traffic, and capable of containing nearly as many as would fill those parts of the houses; and the arrangements for controlling the audience in entering and for facilitating their exit are such that there seems the least possible excuse for any confusion or crowding in either case. The advantage to the public generally of having this separate standing-room for collecting in is obvious when we observe the inconvenience caused by the collection of the pit audience at the Lyceum, forming a crowd across the footwalk, or the *queue* which extends along the footwalk of Shaftesbury-avenue from the pit door of the Lyric Theatre. The theatre is built on the system which will now probably be much adopted, of sinking it half-way below the ground, so that the labour of ascending, and descending staircases is halved between the audience, and no parts of the interior are so far from the street as is the case on the ordinary system; an advantage to the gallery audience, not perhaps quite appreciated by the stall audience who pay at ten times the rate. At all events, there are two sides to the question. One result of the arrangement is that a pumping-engine is required to clear the cellar, beneath the stage of water on occasion, as it is below the level of all drains. The theatre is internally a very pretty one; the decorations of the entrance-hall and *foyer* are rich and effective, though not presenting anything noteworthy in design; indeed, they would hardly harmonise with the exterior if they did. Architectural art, in the true sense, seems to be kept at a safe distance in all our new theatres. The woodwork (doors &c.) of the best portions of the house is of solid and effective design. The pit is a large one, with tip-up cushioned seats, pockets for programmes, brass rings for sticks and umbrellas, all of which care for the comfort of this important portion of the audience is an advance in theatrical civilisation; and as each person has necessarily a separate seat there can be no crushing. The stalls are luxuriously comfortable, with caverns formed under each seat for the hats or cloaks of the next row of occupants. The band is in the usual position in front of the stage, not underneath. The management has declined so far to enter on the fireproof curtain system,—perhaps, excusably, considering some of the recent failures and the difference of opinion on the subject. The construction of the auditorium is fireproof, like that of Terry's and the Court, but as to the much-vaunted system of hanging the tiers, without columns, there is a word to be said. The architectural effect is exceedingly bad, and there is a look of insecurity about it, and we confess we should rather like to see the constructional details showing how the stability of these semi-circular galleries hung in the air is secured. Looking up from the stalls, again, we see the ceiling of the auditorium as a separate decorative circular roof, beyond which is seen the roof over the gallery, with architecturally an exceedingly bad and patch-work effect. Moreover the tiers, which are rather unusually deep from back to front, are too close down on each other, and the effect from the back of the upper circle is like looking on the stage through a horizontal slit, while the gallery audience, with the back of the central ceiling presented to them, seem shut out of the house altogether. We cannot consider this the way to build a theatre either for architectural effect or for the comfort of a great part of the audience; it is all very well to say every one can see the stage, but one does not want to look at the stage through a peephole, and we doubt if most people would not prefer a column or standard at intervals to seeing this mass of apparently unsupported construction over them, especially with so little height and such an appearance of the ceiling almost



closing upon them. In this respect the new theatre is unsatisfactory, and not to be taken as a model.

WE commented last week upon an article reprinted by a contemporary from the *American periodical, Harper's Young People*, in which "railroading" is spoken of as a profession "calling in ringing tones for men to enter." We confessed, in passing, to a little uncertainty as to whether this term signified railway engineering, or railway management; but, if the latter meaning be intended, it must be admitted that, in one respect at least, "American" "railroading" is crying aloud for men. Many of those now entrusted with the management are freely accused of betraying their trust, competition having degenerated into the most flagrantly unfair and heartless "discrimination." The laws are evaded in multifarious ways in order to obtain traffic—trusts and other forms of concentrated capital being secretly favoured to such an extent that smaller rivals are crushed out of existence altogether. Closing of works, and enforced idleness, and consequent distress, necessarily ensue. Detection in underhand favouritism occasionally follows, and we have at various times called attention to lawsuits which have resulted. The law is framed with every desire and intention to protect the weak, but it is frequently rendered practically inoperative through the powerful influence of the "almighty dollar." Only last Saturday the *Times* drew attention to a statement recently made by an American railway specialist, Mr. Charles Francis Adams, who says that he railway managers, especially in the Western States, are notorious for "an utter disregard of those fundamental ideas of truth, fair play, and fair dealing which lie at the foundation, not only of Christian faith, but of civilisation itself." Of course the initial blame rests with the unscrupulous projectors of new and unnecessary lines, who withdraw from the enterprises soon after they are floated. Our Consul at Philadelphia remarked in his last report that the greater portion of the lines through the Western wilderness were laid in advance of the natural need for them. Once laid, they must, of course, attract business; and the crying need appears to be for managers who will effect the desired end by other means than those which have drawn down denunciations such as that just quoted. Integrity and firmness are apparently the essential qualifications, and it is equally necessary that the managers should be loyally supported by the directorate, for without such co-operation, reform is quite hopeless.

THE original plans of proposed alterations to St. Cathbert's Church, Edinburgh, prepared by Mr. H. J. Blanc, have been set aside, and he has prepared a new and greatly-improved set, which have been accepted. According to these plans, the upper gallery has been dispensed with, and additional accommodation, in lieu of it, is to be obtained by throwing out transepts to the north and south of the church and by adding an apsidal projection at the east end. The transepts have a projection of 14 feet, are 44 in width, and will have galleries which will be carried round three sides of the church. Accommodation is to be found for 3,000, and room for the choir and elders, with the organ, will be found in the apse, in front of which will stand the pulpit. Externally the body of the church will undergo a complete transformation, but the spire will be left intact. There will not be towers at the north-west and south-west angles, as originally contemplated, but the apse will be flanked by towers rising to a height of 100 ft., finished with conical roofs. Over the apse there will be a pediment with circular opening in the centre, and the transepts will also have pediments, decorated with floral scrolls and supported by columns superimposed upon a rusticated basement-story. The ridge of the roof is broken by a domed ventilating-lantern. The cost of reconstruction is estimated at 14,000.

THE Spring Exhibition of the Society of Painters in Watercolours contains a larger proportion of important works of the first order than their last very remarkable winter show, though it is not up to the level all round of that rather memorable exhibition. Mr. Alfred Hunt has contented himself with one splendid work, of larger size than he usually contributes to this exhibition, a view of "Windsor Castle" (19) from the river, into which the very quintessence of landscape painting in water-colour seems to have gone. Near this is Mrs. Allingham's one contribution, also one of exceptional power, "Through the Wood" (16), a scene amid the straight stems of a pine wood, with a young woman of the noblest type of rustic beauty in the foreground, carrying a bundle of sticks for firewood and pausing to look after her companions. The very bunch of sticks under her arm looks as if everyone were a separate study. Mr. Thorne Waite contributes several large works. "Beverly Minster" (9) is a scene with an undulating lawn as a foreground and the minster in the middle distance. The building is not very well treated. "The Way Down to the Sea" (72) is a beautiful piece of colour, especially shown in the perception of the warm tone of the shingle beach in the distance as seen against the white chalk cliff; the figures in the foreground are forcibly painted, and throw back the aerial distance. "The Last Load" (84) is another fine work of totally different character. Mr. Walter Duncan's "Progress of Calumny" (160) is an allegorical work of great power, both in colouring and expression. The face of the "fool" in the centre of the picture who passes on the scandal is a masterly piece of character. Mr. Robertson's large picture, "La Douleur du Pacha" (54), suggested by some lines from Victor Hugo, is a *tour de force* of execution, in the architectural detail, the figures, and the smaller accessories, such as the vase in the foreground and the plate of grapes which the attendant is presenting to the Pacha; the subject unfortunately wants point and interest, but it is a very remarkable drawing. Mr. Gregory's "Luther's Abstraction" (142) may dispute the palm with it as a splendidly-finished piece of work, but is very stagey in grouping and feeling; his landscape "St. Lo" (131) has the same kind of deficiency; it is too neat and polished-up for nature. Mr. Tom Lloyd's "Mid Stream" (26) is a fine study of a boatload of people crossing a wide river, two men rowing hard, women forming a finely-composed group in the stern; the water is not satisfactory, especially where the artist has, to get a sunlight effect, piled on opaque colour so that the "waves" stand up in relief on the paper; a very illogical practice. Mr. Wainwright's life-size study of an old monk, under the title of "The Serving Brother" (168) is a powerful and pathetic work. Mr. Henry Moore has a splendidly bright and breezy sea in "A Breezy Morning" (128), a work which is at his very best for force and vigour. Mr. Eyre Walker's very remarkable effect of light in "Barden Beck" (48) deserved to have been hung in a more appreciative spirit, especially considering the wretched piece of commonplace in the way of figure-painting which usurps "the line" immediately over it. Mr. Poynter's "Walls of Old England" (8) is a grand coast scene; we cannot consider his "Mulgrave Woods" (27) so successful. Mr. Wilmot Pilsbury keeps up to his old form in the minute finish of his rather hard landscapes; his "Leicestershire Farm" (46) is admirable as far as it goes, and the wagon all that a wagon should be, but it is one thing to paint wagons as accessories and another thing to paint cathedrals, and in "Tewkesbury Abbey" (87) he has not done justice to the building. Of Mr. Herbert Marshall's various works "Evening in the City" (41) is the most important, and "An Old Wharf near Stepney" (97) the most perfect. "The Young May Moon" (138) is one of Mr. Tom Lloyd's most beautiful and poetic pastorals, the manner in which an evening warmth and glow are imparted to it by a slight hardly perceptible halo

of light warm colour outlining the figures against the sky is noticeable: it produces its effect, unquestionably. Mr. Albert Goodwin's drawings are some of them rather too slight and sketchy to do him justice; the best are "Pisa" (46), a view from outside the town, in which the architecture is beautifully treated, and "The Harbour Bar" (108), with a portentous evening cloud hanging over a scene which we take to be Great Yarmouth. His "Fisherman and the Genie" from the "Arabian Nights" (98) should be looked at, but is not one of the best of his imaginings of this class; but let us welcome a painter who tries to imagine anything, in these realistic days. Mr. T. J. Watson's "Surrey Hamlet" (11) and "In my Garden" (18) are good compositions which fail from being totally deficient in natural colour and atmosphere: Nature is not like that, and it is no use any painter telling us so. We regret to see Impressionism making its way into this exhibition in the shape of such a work as Mr. Melville's "Fête of the Dosseh" (153), clever enough no doubt, but with a pernicious and maladroit cleverness. Among other things may be mentioned "The Little Meadow by the Brook" (13), by Mr. J. W. North, if he had only omitted those mechanical flowers in the foreground; "For Phœdra's Birthday" (88); Mr. Lawrence Bulleid, a pretty little Alma-Tademaism; "View from Torr-alunn Wood" (99), Mr. F. Powell; "The Gulls' Home, Sark" (134) Mr. J. Parker; "A February Pastoral" (44), a fine snow scene by Mr. Eyre Walker; "A Do-ruck and Chool'leh Merchant, Cairo" (101), in fact a seller of large earthenware pots, a curious and interesting study by Mr. Henry Wallis; "Bridge at Dalegarth" (156), by Mr. Cuthbert Rigby; and "Evening in the Glen" (193) a grandly-built-up landscape by Mr. Colin B. Phillip.

IT appears that at "Olympia" there is to be organised an exhibition of the pictures rejected by the Royal Academy in the years 1887, 1888, and 1889; the R.A. label on the work being taken as a guarantee that it was one of those rejected at the Academy. If this kind of exhibition is to be an institution, it may become a kind of easy provision for exhibition for those who cannot paint: send in a picture to the Academy and get the *imprimatur* of the Academy label and the honour of Academy rejection, and a new kind of claim to be exhibited is established. We do not think the exhibition is likely to have any effect in impugning the judgment of the Royal Academy Hanging Committees, the rather since we shrewdly suspect that the best men among the rejected will not care to advertise the fact, and "Olympia" will only get the worst of the rejected ones.

A THIRD collection of drawings by Mrs. Allingham at the Society of Fine Arts, Gallery, of which the private view was on Saturday last, is if possible even finer in character than her preceding exhibitions, in spite of the presence of a certain proportion of drawings labelled "unfinished." The subjects of the present collection are mostly taken from Surrey, with a few from the Isle of Wight. How the artist finds time to accomplish such a mass of work in so conscientious a manner is the wonder; for, except in those that are marked unfinished (and Mrs. Allingham's "unfinished" would pass for high finish with some artists of the latest school), every portion of these little drawings is equally carefully studied. One of the charms of these little landscapes is in the mastery way in which the figures are studied and suited to the scene, and the expression put into them, on this small scale, without hardness or over-finish of detail: the intention and meaning of the figure is always completely shown, and yet it always blends with the landscape and is never obtruded or forced into notice. A charming example is "The Spring Cope" (7), where the girl who has gathered a nosegay of spring flowers is so typical a representative of the cottage girl,



"not too bright or good" to be believed in, but genuine nature. In "Bluebells" (10) the bright patches of blue are magical in effect. "Hillside Cottage" (17) is a representation of an English rural garden with flowers of every kind rioting over it. Among others to be particularly noticed are "Minna" (31), a girl in blue dress among the blue irises; "Mrs. Willott's" (32), where the figure of the woman feeding the fowls over the gate is a perfect study; "The End of the Day" (41), a fine solemn landscape of more than the usual size, beautifully true in its effect of evening light; "Gathering Flowers" (50) and "In a Flower Garden" (55), where two beautiful children are shown knee-deep in flowers; "The Black Kitten" (63) and "The Old Malthouse" (68), noticeable for the beauty and grace of the figures as well as for other qualities; "The Sand Pit" (66), "Cutting Lavender" (36) &c. To see the exhibition is like having been away for a day in the country.

**EX-BAILIE CRAWFORD**, Chairman of the Health Committee, Glasgow, presided on the 24th ult. at the distribution of prizes to the successful students of the plumbing class at the Glasgow and West of Scotland Technical college. Among those who assisted in the proceedings were Professor Jamieson, Mr. David Thomson, Chairman of the Technical Education Committee; and several leading architects of the district. The chairman explained that the class was originated and subsidised by the District Council for the National Registration of Plumbers acting in co-operation with the Worshipful Company of Plumbers, London. He had good reason to believe that it was the largest and most successful class of the kind in the kingdom. It had 126 matriculated students, with an average attendance of 109, of whom many came long distances by rail, paying their own fares. He was a strong advocate of technical education for plumbers, because in his official capacity he was being constantly brought face to face with defective plumbing work. In that class the young plumber would get a thorough knowledge of the principles of his art, and would be taught how to practically apply them to his daily work. Mr. John Honeyman and others gave some sound practical advice to the students; and Professor Jamieson, in the course of his remarks, stated that the illustrations in the note-books of many of the students were quite equal to those in the class on applied mechanics.

**AMONG** periodicals or weekly papers of recent date the following illustrations of architectural subjects may be mentioned. The *English Illustrated Magazine* for May contains some notes on Abingdon, by Mr. Louis Davis, accompanied by some sketches of picturesque corners and old buildings. In the *Portfolio*, Mr. Loftie's papers on Westminster Abbey are continued, accompanied by a full-page view of the Abbey and St. Margaret's from the north, by Mr. Herbert Railton, a masterpiece of picturesque drawing in pen-and-ink; there are various other sketches by the same artist of portions of the Abbey. The last number of *L'Architecture* gives some photographs of portions of the skeleton constructions at the Paris Exhibition, as seen in progress, but these are hardly large or distinct enough to be of any value as illustrations of construction. The last number of the *Revue Générale de l'Architecture* gives an illustration of a fine grille (modern) at Chantilly, and some very finely-executed engravings of M. Dieulafoy's details from Susa. *Building* (an American journal) contains in its number for April 13 a clever line sketch by Mr. H. B. Kirby called a "study for a tower," and a view of what at first we took to be an "old colonial" residence with a pediment and columns in the middle, and a round pond before it; but it seems this is only a piece of imitation eighteenth-century design by a modern architect, Mr. W. A. Bates. It is well done, but this kind of imitation is a mistake. No. VII. of the

*Technology Architectural Review* contains designs for an imaginary Court-House and Gaol, and an imaginary Music-Hall; in the latter the seats in the auditorium are not sloped at the scientifically-ascertained section, which should curve downwards slightly from the front of the orchestra, and then ascend. The illustrations are beautifully executed.

**A** REALLY bright day with an unclouded sky, of which we had one or two lately, at once brings out the real beauty of many views in London, often lost by the obscurity of the atmosphere. Going eastward along the Strand on one of these days, the two towers of St. Mary and St. Clement Dames, shining brilliantly white against a clear blue sky, one rising by the side of the other from this point of view, looked perfectly beautiful, and suggested ideas of Italy rather than of England. Yet it is to remove this charming piece of architectural scenery for ever that a committee of wise-acres interviewed the London County Council on Wednesday,\* while the *Daily Chronicle* informed its readers on Thursday that the church was a "grievous obstruction," and "not of sufficient value architecturally to be worth preserving." The stupidity and Philistinism of English newspapers on these subjects are only equalled by the complacency with which they constitute themselves authorities on architectural and artistic questions.

#### THE NEW GALLERY AND THE GROSVENOR.

THE amount of picture-painting activity among us at present is certainly very remarkable, for in spite of the secession from the Grosvenor Gallery and the formation of two picture galleries on the field formerly occupied by one, there does not seem to be any very material falling off in the standard of work in either gallery. Not only are both well filled, but they are filled with pictures the larger proportion of which are of no little interest, though of course only a few in each gallery are of the highest class.

The hanging at the New Gallery is rather adroitly managed so as to draw the spectator at the outset, and instil into his mind the idea that he is in an exhibition of selected pictures of high excellence. The impression thus produced by the early numbers in the hanging, though not borne out as we proceed round the galleries, tends at all events to put the unwary critic in a good humour and dispose him to see things *couleur de rose*, unless he happens unfortunately to be an "old parliamentary hand" not to be taken in by these blandishments. At all events, the first numbers in the New Gallery catalogue include some very good things. We commence at No. 1 with a most interesting exhibit, the first picture which Mr. G. F. Watts exhibited at the Royal Academy, just fifty-two years ago. And what was that? A Fate, or a goddess, or an allegorical Virtue? Nothing of the kind; a life-size painting of "A Wounded Heron" just tumbled to earth. Not the kind of subject we connect with Mr. Watts's name now, but in the broad style of handling and rich harmonious colouring of the landscape we can see the same qualities which have characterised the painter in the treatment of more ideal subjects. Below is a fine little landscape study of the effect of "Fog off Corsica" (2) by the same artist. Then Miss Hilda Montalba charms our architectural eyes with "A Venetian Wall" (3), and Mr. Herkomer follows with a remarkably fine solidly-painted portrait of "Sir Joseph Hooker" (4). Next is Mr. Poynter's "Roman Boat Race" (5) between four galleys, one of which we are on board of, and in company of a charming girl looking over the quarter railings, whose face stands out clear and fresh against the background, but for all her Roman dress she is a modern English girl; nor are the galleys such genuine Roman machines as Mr. Tadema made for us in his "Antony and Cleopatra." The incident is told with spirit, the nearest of the other galleys is evidently edging in upon ours,

\* It has been publicly demonstrated that the portion of the Strand alongside St. Mary's is a good deal wider than other parts where complaint has been made; but of course the Strand Highway Improvement Association cannot take notice of facts which would put them in the wrong.

and the steersman with the long "sweep" is exerting himself to keep her away: but somehow it is not real; it is a good stage scene. Mr. Tadema's contributions to the Gallery are grouped here, Nos. 7 to 10, of which "A Favorite Author" (8) is the most characteristic of the artist; a marble floored interior with the walls lined with bronze *repoussé* panels, two or three of which are turned on their centres and prove to be metopæ slabs through which we see trees and a piece of white marble cornice and a Corinthian capital sparkling in the sun; beside these details the two girls reading and listening are, we must confess, of minor interest. Mr. Tadema's other contributions are all portraits, of which that of M. de Soria is a striking and powerful one.

Mr. Strudwick's "Ramparts of God's House" (13), well executed no doubt, is one of the most childish of the mediæval naïvetés to which a certain class of artists treat us now. Angels stand about on a platform built on arches which descend into clouds and stars, and a nude woman, with the long chin introduced by Mr. Burne Jones, is politely handed up out of the clouds by an angel. If these long-chinned women are admitted into Heaven it will hardly be worth going to. Behind the platform is an arched building with angels looking out through the arches, and a red-tiled roof over it. That is Mr. Strudwick's intellectual conception of the celestial mansions. This drives us over to the other side of the room to look at Mr. Watts's principal work, "Fata Morgana" (57). The Fata is a flying semi-nude figure whose figure and flying drapery together form a kind of crescent; the painting of the figure has that rich semi-bronzed tone which reminds us of the artist's great monumental figure of "Daphne." A man, dark of complexion and in crimson dress, chases the flying vision. This is a noble and quite successful allegorical work; successful because it is entirely and consistently ideal in style, and not a crude mixture of idealism and realism. As a contrast we may take Mr. Kennedy's very clever painting in the north gallery of "Neptune" (114) supposed to illustrate a passage from Keats's *Hyperion*.—

"Have ye beheld the young god of the sea,  
My dispossession . . . . foam'd along

By noble winged creatures he hath made?"

Here we have a fine young man riding astride on a kind of semi-idealised shark, and a young woman sitting decorously but insecurely sideways on another, ploughing through the waves in a heavy sea. The thing is very spirited, but the figures are nothing but nude studies; there is no godship about them. A painter who attempts to illustrate so highly imaginative a poem as *Hyperion* must have imagination of his own to bring to the task, or the result only becomes (intellectually) ludicrous. Mr. Richmond's "Death of Ulysses" (77) is a failure not from being realistic, but from his utterly feeble conception of the hero: otherwise the composition, with the two figures by a semicircular palace window looking out upon the sea, is fine and effective. The only other remarkable work in figure painting (besides portraits) is Mr. Watts's "Wife of Plutus" (184) a most repelling but powerful painting of the head and bust of a large flushed, sensuous woman, in deep sleep, but clutching in her sleep at a handful of jewels. This is one of the class of "pictures with a moral" which are apt to lead their author, and certainly have occasionally led Mr. Watts, to attempt meanings beyond the proper scope of painting to express; this one is a success and tells its tale powerfully, though it is anything but an agreeable work, and of course was not intended to be so.

Among portraits Mrs. Merritt has a good one of "Mrs. Holman Hunt" (44), and Mr. Wigram a fine one of "Mrs. F. Wigram" (66), an old lady in a black dress with some white lace, seen in profile against a dark background formed by the wainscot of the room; as in all Mr. Wigram's portraits, the face is painted with great delicacy and truth. Mr. Richmond's "Mrs. Buxton" (74) is one of those conventional decorative portraits with the face painted as if in wax, which are a speciality of this artist, and have a beauty of their own, but it is a beauty of a spurious and unlike kind. Mr. Sargent, in his portrait of "Miss Terry as Lady Macbeth" (110) makes no attempt to tone down or harmonise in any way the truly barbaric crudeness of colour in the costume; the result is no doubt striking, for one cannot well pass it by, but very harsh and repelling to



the eye. Mr. Shannon has got something original and very graceful in his portrait of "Miss Jean Graham" (117) leaning against a doorway (is it?) reading a book; but the texture of the dress and the precise nature of the background are rather doubtful. Mr. Collier's portrait of "Mrs. Harold Roller and Joyce Collier" (129), a lady and child, is a fine work, the half-playful face of the child tells prettily in contrast with the apparently assumed melancholy or abstraction of the lady. "Miss Louisa Wilkinson" (148) ought hardly, we should think, to feel much obliged to Mrs. Swynnerton for the way she is represented in this portrait, which is an unfortunate example of that recent tendency to attract attention by oddity and ugliness in portraits, which we have noticed before. Mrs. Swynnerton is a very clever artist with some original perceptions; but the style which appears suitable enough in painting an ideal half-grotesque character (as in her previous works), has a different effect when applied to portraiture. Among portraits with a special interest are two small ones of Lord Rayleigh in his Laboratory" (209) by Mr. Philip Burne-Jones, and Mr. Watts working on a colossal statue (130) by the same artist. "Nor must we pass over Mr. La Thangue's "Portrait of Mrs. Tom Mitchell" (154) a seated life-size figure said to have been 'studied by lamp-light'; it hardly realises that impression, but it is a fine and carefully finished work. The fact is that effect by lamp-light is a very difficult thing to give in a painting, because if a painter gives the real effect of the high light on a face artificially lighted, and of the darks where the lamp-light does not attain, his picture will appear patchy and he will certainly be accused of having produced a sensational and artificial effect; and yet with a more diffused light he cannot produce in painting an effect which will strike the spectator as lamp-light, though the latter may see the intention when told of it.

There are some fine landscapes in the New Gallery, but the tendency of landscape painting here is too much in the direction of effects which are charming in themselves perhaps, but hardly nature. Mr. J. W. North's "A Sweet Meadow in England" (16) and "When Wheat is Green" (38) are lovely effects in demi-tint, but while professing to be scenes of simple nature they want the light and air of common day; how different in this respect from Mr. Adrian Stokes's fine work, "The Wet West Wind" (91), a barren seaside scene full of wind and rain, and which is quite refreshing after looking at some of the artificial effects of other works in the Gallery. Mr. Boughton paints what he calls "A Morning in May" (134), but there is none of the May sunlight in it. Mr. Alfred East's "Gay Morning" (208) is a welcome contrast; here the morning is really "gay" and the landscape flooded with light. Mr. Henry Moore has a fine sea-piece, "In Sight of Sark," and near it is one of the best aerial and one of the best composed landscapes in the gallery, Mr. Parsons' "On Mendip" (189). Among smaller works may be mentioned Mr. Eyre Walker's "Close of Day" (217), and two town scenes, "Shadows and Sunlight, St. Ives" (170) by Mr. P. Norman, and "Sandwich" (242) by Mr. Newton Bennett.

Mr. Nettleship's life-size painting of a Polar bear, under the title "In the Uttermost Parts of the Sea" (138) is a grand work of its kind; and the same grand though disagreeable animal was furnished Mr. John M. Swan with an admirable study on a smaller scale of "Polar Bears Swimming" (27), which is a remarkably apt picture, and conveys the impression of having been due to direct observation, though here are not many artists who have the opportunity of seeing the Polar bear swimming in his native seas. Among sculpture exhibits perhaps the most important work is Mr. Mullins' "Euphrosyne" (405), a kneeling life-size figure of a woman with a little child standing at her knee. The group is finely composed, and thoroughly sculptural in style, though the child is hardly the realisation of Goethe's creation. The same sculptor's "Life's Jest" (409), a boy apostrophising a comic mask, is very clever and vivacious. Mr. Swynnerton's prone group of "Lear and Cordelia" (407) is good as statuary, so to speak, but quite beneath the subject in conception; Lear is a stage figure and Cordelia merely a gentle pretty girl who seems to have fainted in his arms. Mr. Legros sends two large models of caps for milliners, the centre part in each being occluded by a large mask or face, with scroll foliage

below and on each side, curling up to the abacus; these are fine and bold in design, but impress the architectural eye as out of proportion, being too narrow for their height; possibly however this is to allow for foreshortening when placed in position high above the eye. There is a fine bronze bust of "Clytie" (403) by Mr. Watts, with the head thrown back over the right shoulder in a way which is rather deficient in repose for sculpture. Among little things Miss Ida Clarke's "End of the Day" (419) a miniature study of cart horses and their riders, is exceedingly good, as also "The Toiles" (421) of a cat by Miss Chaplin, whose ability in the sculptural treatment of animals is well known to frequenters of London exhibitions.

The *chef d'œuvre* of the Grosvenor Gallery is a portrait of a lady by Sir John Millais, under the title "Shelling Peas" (58); a blonde young lady of splendidly healthy complexion seated, clad in what we are told is called by ladies a "cream-colour" dress, shelling peas in a china bowl. The harmony of colour in the whole is complete, unless we were to raise an objection to the parson's hat left on the table, which does not add to the picture; but what strikes one in comparing this portrait with some others of the most attractive ones in the Gallery, is the difference between genius and mere talent of manipulation in painting, which could hardly be better illustrated. The strength of the Grosvenor lies in portraits; but the rest of them stand on an entirely different plane from this one. Mr. Pettie's "Mrs. Coats" (75) is one of the most striking, though a little hard; it shows an elderly lady in black dress, seated very upright in an armchair, backed by a cushion of golden hue which she does not seem in the least to need. Mr. Shannon's "Mrs. Tower" (81) is what may be called an "elegant" portrait of a lady in light-blue dress and a fur of nearly the same tint over her shoulders, the face and hands very finely painted, but the attitude of the right hand hanging over the chair rail savours of affectation, whether due to the painter or his sitter. In his portrait of "Mrs. R. E. Hoare" (97) Mr. Hacker has made much of the decorative effect of a green dress with a tremendous train, successfully in one sense, but the portrait seems to be all dress. Few portraits in the Gallery will be more popular than Mr. Stuart Wortley's "Miss Tomb" (37) which does not represent a high style of art, but is bewitching from the look of *espiguerie* in the pretty face, and the careful painting of a costume which exactly suits the personality of the fair sitter. Mr. Wortley has another portrait of rather individual character, the bust portrait in profile of "Miss Ella Stanier" (142), in an oval frame, a beautifully finished work of great refinement. There are two interesting portraits of children, that of "Gladys" (10) by Mr. Mount London, a little child with her rose face framed in a swans' down tippet, and one of an older girl, "Dorothy, daughter of J. Nutting, Esq." (114), who is a young athlete with a foil in one hand and a mask in the other; a very spirited portrait, but the modelling of the face and throat looks rather too old for the presumable age of the child, as indicated by her dress. On a separate stand in the centre of the room is the Princess Louise's half-length portrait of "Colonel the Honourable Sir Charles Lindsay" (117), in complete armour, with which the fine rather rugged head harmonises exceedingly well, and the whole portrait is a piece of fine forcible painting, and tells exceedingly well.

Of figure subjects other than portraits there are not many that are very remarkable. Mr. Goodall occupies the top of the West Gallery with a large elaborate painting called the "Pets of the Harem" (90), a sort of title that seems to belong to another generation of pictorial taste; the materials are a woman, a monkey, an ibis, and much Oriental decorative detail carefully painted; in covering the figure with only a diaphanous semblance of drapery the artist has unfortunately left it to be clearly seen that the drawing is not irreproachable; the perspective of the lower part of the body is wrong, and shows as if the figure were more nearly facing the spectator than it is. This sort of elaborate painting of commonplace does no good to art, whatever labour goes to it. The best figure subject is Mr. Dendy Sadler's "Darby and Joan" (121), an old couple pledging each other from the opposite end of the dining-table in a richly-furnished room; it is evident that the idea of the picture has been suggested by some of Mr. Orchardson's subjects, though it

is needless to say that the execution is in a very different manner. The details are finished with great care, and the figure and face of the old lady admirably convey a type of old lady whom some of us can remember, but who will soon be an extinct variety. She was not "advanced" nor scientific, that old lady; she was probably in her younger days just a Bath beauty, but she had some qualities of courtesy of manner and refined feeling which seem to be getting sadly ground down in the hurry of modern life. The husband is a little too young for Joan, and is not so interesting or characteristic a figure. Among other things may be mentioned a very clever little painting, both in character and execution, of a half-length of a "Child with Silver Fish" (92) by Mr. W. R. Symonds. The large painting by the same artist of "Mignon" (112) seated on the floor in a large coloured room,—

"Es gliest Der Saal, es schimmert Das Gemach"

might be a quotation for it,—deserves attention, but it is hardly Mignon; as in so many other cases of paintings in illustration of great poets, the painter has not risen to the level of the poet's conception.

There are several landscapes of interest in the Grosvenor, though there is the same tendency as in the New Gallery to a conventional interpretation of nature. Mr. Macdonald Whittier's "Weird Sisters" (8), three decayed trees on a heath, with a lurid sunset behind, is fine; the foreground tree seems to partake too much of the general colour of the foreground. A river scene (18) by Mr. A. Le Gros, painted in a soft style of handling perhaps rather suggested by Corot (though it is not like Corot altogether), in spite of a certain unreality of effect, is a picture with distinct character and which improves on acquaintance. There is an excellent example of Mr. Hook's work (38), and in "The Tidal Pools of Heligoland" (22) Mr. Hamilton Macmillan has shown very well the effect of the tumbling sea seen on the other side of the spit of level sand which separates it from the quiet pool where children are bathing. "A Sussex Sheep Washing" (42) is a good work, not very interesting, by Mr. C. E. Johnson, who is one of the natural school of landscape painters. Mr. Wyllie makes an admirable picture out of the Midway (50), notable for the look of movement in the water. One of the best landscapes in the Gallery is a small one by Mr. Anderson Hague, "Feeding the Ducks" (72), which seems to have been painted under the inspiration of Constable, and in which the painter is not much behind his model. Mr. David Murray's "In Flowery Mead" (109) is another village landscape which has the light of day in it, and "The Oak Farm" (178) by the same artist, a larger work representing merely a back country lane between farm buildings on one side and trees on the other, is a very real transcript of nature. Higher qualities are seen in Mr. Alfred East's "Gentle Night" (170) a moonrise scene beautifully composed, full of the sentiment of evening, and in which the painter has managed to make his rising moon luminous without sacrificing to it every other shred of colour in the picture, as in Mr. Brangwyn's "Homeward" (89).

Another fine landscape which rather recalls the style and feeling of Cotman, is Mr. Llewellyn's "Twist Night and Day" (158), a Cornish harbour with dark water in the foreground and houses rising behind golden in the rays of the setting sun. As to Mr. John R. Reid's landscape "The Mussel Gatherers" (141) it may be called powerful in a sense no doubt, but that kind of thing will not do; nature's colour is not like that, on this planet at all events, and it is no use trying to persuade people so. Among pictures in which architecture is dealt with we may mention Mr. Tristram Ellis's "A Peep through the Door of the Parthenon" (226) and Mr. Arthur Severn's "Abbey Church, St. Riquet, Abbeville" (315). Mr. Heywood Hardy's equestrian portraits should not be overlooked, especially "Sir Frederick Milbank" (80), a small painting of a man seated on a splendid black horse, in a forest glade, which is perfect of its kind.

Judging from the crowd at the private view, the Grosvenor seems to have lost none of its popularity as a place for meeting friends, and for the display of carefully-elaborated costumes on the part of one half of mankind. How much love of art has to do with it may be perhaps fairly gathered from the following remark overheard from a lady in the crush—"Oh, if you are going to talk painting, I'll move on!"



THE DIARIES OF SIR WILLIAM  
DUGDALE.

THE recent recovery of the missing volumes of the carefully-kept diaries of Sir William Dugdale, Garter King-at-Arms in the reign of Charles II., has drawn attention once more to his labours.

He was born in the year 1605, at Shustoke, near Coleshill, in Warwickshire. At the exact time of his birth a swarm of bees alighted in his father's garden. Anthony à Wood tells us the famous "figure-finger," Lilly the astrologer, declared this swarm foretold that the babe would be a prodigy of industry, but adds, depreciatingly, that, when he gave this interpretation of the coincidence, the great antiquary had already given public proofs of his unceasing application to work. At this time Shakespeare, Bacon, Ben Jonson, Sir Walter Raleigh, Lord Herbert of Cherbury, Sir Richard Baker, Sir Henry Wotton, John Selden, and many other Elizabethan celebrities were living, and carrying on those labours we now consider classic, and James VI. of Scotland had but recently succeeded to the Crown of England. Into this famous band of contemporaries William Dugdale entered under some further happy auspices, for his father was able to give him a liberal education. As he lived to be upwards of eighty years of age, he survived all the great men mentioned, also Charles I., Oliver Cromwell, and Charles II.

In the course of this long period, besides the great work that is allowed to be second only to Domesday Book as a record of the history and descent of the landed property of England, he compiled nine other works of very considerable importance, and left twenty-seven folios in his own neat handwriting, which he bequeathed to Oxford. At the same time he performed all the duties belonging to his successive appointments in the Herald's College, of Pursuivant, Herald, and Garter Principal King-at-Arms.

About five years before he died he sent a packet to Anthony à Wood, the Oxford antiquary. This contained "A brief account of the Parentage and what else is memorable of Sir Willm Dugdale, Kt. Garter Principall King of Armes," in his own handwriting. In due time it was deposited, with other MSS. left by Wood, in the Ashmolean Museum. This worthy methodically endorsed it:—"Drawn up 1680. Sent to me in the beginning of the year 1681. To be published by me (with other things added) after the death of Sir W. D. A copy of his picture I am to put before it. Mr. Ralph Sheldon of Beoly, hath an original drawn by the happy hand of Edm. Ashfield 1676."

Events are mentioned with telegraphic compression in the diaries. After the antiquary's marriage, which took place when he was seventeen years of age, he made a visit to London, where he became acquainted with many persons "affected" to antiquities, including Sir Christopher Hatton and Sir Henry Spelman, who brought him to the notice of the Earl Marshal, by whom he was created a pursuivant. In the following year he was made Rouge-Croix, which gave him a lodging in the Herald's Office, a small salary, and entitled him to fees. In this capacity he was summoned by Charles I. to attend him at York, to which place the risings and tumults had induced the King to withdraw. Thence he was sent by the King to the castles of Banbury and Warwick, then in the hands of the rebels, to proclaim Lord Brooke and his adherents traitors, unless they laid down their arms and returned to their homes. Arrayed in his coat of arms, with trumpet sounding, Dugdale approached Banbury Castle first, which was immediately delivered up. Sir Edward Peto, in command of Warwick Castle, answered he was entrusted therewith by the Parliament, and would defend it, whereupon he and his followers were proclaimed traitors at the Castle gates. Dugdale was next sent to perform the same ceremony before the gates of the city of Coventry; and then to escort a party to relieve some soldiers injudiciously placed in Kenilworth Castle, which party was pursued by the rebels, and had to turn and fight them before they could join the King's forces at Nottingham. Dugdale next attended the King to Shrewsbury; and, after the battle of Kington, to Oxford. Here, with his own estate sequestered and his master's treasury too exhausted to admit of payments, he remained with him for the three years and eight months that elapsed before the surrender, performing such duties of his office as attending the funerals of several noble persons, and

making good use of the opportunity to search the libraries of the colleges for materials for his works, and jotting down in his diaries, or almshouses as they were called, the brief notes that tell so much and yet so little. Among hundreds of similar short entries, we read:—"Queene impeached of treason. The great plott discovered at London and Mr. Waller apprehended. Sir Thomas Fairfax flies. His lady taken. Burleigh House, near Stamford, taken by the rebels, under y<sup>e</sup> Command of Colonel Cromwell. Gloucester besieged. Wingfield Mannour in Derbyshire taken by 500 of y<sup>e</sup> E. of Newcastle's forces, commanded by Sr Francis Mackworth. Arundell Castle Yielded to Sr Wm. Waller. A trumpet came to Oxford from y<sup>e</sup> Earl of Essex p'posing Col. Goring in exchange for the E. of Louthian, a Scott. Tewkesbury assaulted. This night about 60 prisoners broke out of y<sup>e</sup> Lady Hayles her house in Warwick, w<sup>ch</sup> y<sup>e</sup> Rebels had made a prison for them, whereof some came to Worcester, some to Dudley Castle, and others to Banbury, his Matyes garrisons. Lincoln taken by the rebels. Leicester rendered to the rebels. Hereford surprised by the rebels. This morning about one of the clocke, the King with Mr. Aashburham and Mr. Hudson (a divine) went out of Oxford disguised, towards the Scotts quarters."

The modes of travelling are alluded to but briefly. On March 13, 1660, the antiquary set down "my daughter Lettice went towards London in Coventre waggon." On May 10, he wrote, "I proclaimed the King in Coleshill;" on the 13th, "I came to London by post horses." In September, "I came out of London in Coventre Coach." Another entry says, "I went in Oxford Coach from London to Beconsfield." There is frequent record of travelling with funerals, but no mention of the manner of it. But we can see places in public vehicles had to be bespoken a few days beforehand from the following:—"June 28. Given sixteen shillings in earnest and for my passage with my man in Aylesbury Coach on Thursday next." Occasionally, he was met by his own horses, as when he says: "I came by coach from London to St. Albans. Thence to Toucester by my own horses."

We may see the antiquary had his gratifications as well as his troubles. Though he was obliged to suffer a long lapse of time to occur before the issue of the second volume of his great work, the "Monasticon Anglicanum," so that the heavy costs of the first one might be gathered in, he met with wonderful assistance, much appreciation, many thanks and proffers. Thomas Peake wrote to him from Norwich, to promise him a statue in gilded brass, to be set in the market place of Norwich, if he would write the history of Norfolk as he had done that of Warwickshire. General Fairfax, praising his works, wrote to him, "They smell much of the lamp," evidently intending to compliment him in the highest degree. Young Lord Herbert of Cherbury sent him a copy of his grandfather's "De Veritate." On one occasion he had a loan of ten porters' loads of MSS. relating to St. Paul's Cathedral. His various acquaintances introduced him to persons able to give him access to all the chief records of the realm, the Domesday Book, the Red Book, Testa de Nevill, Kirbie's Quest, Plea-rolls, the Records of the Treasury and of the Tower. He was also introduced to Sir Thomas Cotton, who gave him permission to use the splendid collection of rare manuscripts collected by his father. In this library he enjoyed the pleasure of sorting some of the MSS., and having them bound with clasps and stamped in gold with Sir Robert's arms. One of his daughters married Elias Ashmole, the "curioso and virtuoso," who was surely a man after his own heart. And when he was created Garter Charles II. added to the distinction by knighting him and placing the badge of the order about his neck. This elevation gave him a residence in Windsor Castle, called Garter's Tower, over and above the lodgings belonging to the Garter King-at-Arms in the Herald's office. He corresponded with Sir Thomas Browne, chatted with Pepys, and dined with Evelyn. It must have been, also, a source of gratification to him to have been able to purchase the Manor of Blythe, near Coleshill, after the death of his father, where he resided as long as he lived, adding to the hall and enclosing the arable fields as years went by.

Some of his troubles were the result of the "untoward tymes" as he calls the rule of the Parliament, as when he had to compound for his estate, and enter into recognisances of £1,000, and was restricted for a long time to keeping

within five miles of his house, and afterwards to within one mile. Some attended the publication of his works, the booksellers not being over eager or over sanguine concerning them, and the costs of "the many curious and chargeable cuts" for them; others were charges of plagiarism and attempts at piracy; others were encroachments made by unauthorised persons who put up false achievements, as in the case of "Holmes, y<sup>e</sup> paynter," of Chester, and in that of "Nower, a paynter," in London. Others were long journeys on the occasions of his heraldic visitations, in which he pulled down improper achievements. One visitation brought him as far north as Morpeth and Alnwick. He has entries, too, of various earthquakes, which were probably a further source of trouble to him as they would be to us; of two suns being visible on two occasions; of the great frost, when carriages drove up and down the Thames as on the roads; of a trial as to a right of fishery; and towards the end of his days there is word of applications for the reversion of his appointment. He found at this time, too, the "Gole smoke ayre" of London was detrimental to his health.

Many of the miscellaneous items set down have interest. Dugdale mentions he saw the eleven crosses quite perfect, in his young days that were set up by Edward I. at the place where Queen Eleanor's body rested on the road to its interment in Westminster Abbey, which were knocked about to their ruin by the Parliamentary folks. The gunner who shot down Lichfield steeple in the siege of 1646 was killed four years afterwards by the bursting of a cannon at Stafford. To Hollar, the artist whom he employed to illustrate some of his works Dugdale made a present of a "gowne cloth, that cost twenty shillings, and he paid four shillings for making it. He paid for a dozen of silver spoons "of the new fashion," at sixpence each; for a little silver cup, "called a tumbler," one pound thirteen shillings; and for gravings the arms on all of them, six shillings. He mentions an item that shows the custom of burying in stone coffins was still in use at the end of the seventeenth century:—"Paid to Willm Langley the mason for two large stone coffins, and making a vault for them at the upper end of the chancel at Shustoke on the north side two pounds twelve and sixpence." (These coffins were for himself and wife.) We learn coat-making was carried on then in St. Martin's-lane, London:—"Paid to Mr. Meares, a coach-maker in St. Martin's-lane, for a little chertie which then sent down into y<sup>e</sup> country, twenty-two pounds and thirteen shillings." He paid seven pounds for the thirty yards of lace for his "suits" for the coronation of Charles II., at four pounds ten shillings for a "honor robe." He received a hundred pounds for drawing up the pedigree of the Earl of Denbigh, of which sum he gave the bearer of it five pounds. August, 1657, he made a note to the effect that the north part of Paul's Churchyard, being the north part of the ruins of the chapel house and cloister, was made into a market place, and the herb-women had removed the standings to it out of Cheapside.

After the "Monasticon Anglicanum" then came from the pen of our antiquary the "Antiquities of Warwickshire," the "History of St. Paul's," "An Account of the great Work of Draining the Fens and Marshes," which he quaintly compares to that great work when, in the beginning, God said, "Let the waters be gathered together, and let the dry land appear;" the "Origines Juridicales" (a copy of which Pepys tells us he bought); "A brief discourse touching the office of the Lord Chancellor"; "The Barons of England"; "A short view of the late troubles in England"; "The ancient usages in bearing of such ensignes of honour as are common called arms; with A catalogue of the nobility of England, to which were added catalogues of the nobility of Scotland and Ireland"; and finally, "A perfect copy of all summons of nobility to the great Councils and Parliaments of this realm."

These writings are nearly all laden with passages relating to arms and heraldic usages: Coronations, proclamations, installations, funerals, visitations, and pedigrees pervade most of the pages. There is a slow and stately movement about them as of ceremonials, with the flutter of standards and pennons, a glitter of helmets and spurs. Considering the very few of us can state the maiden names of our four great grandmothers without consid-



able research, as Mrs. Thrale is said to have remarked, it is as though we were exploring a new world to note the extreme significance of every individual as we turn over the pages of these works. Dugdale entered into the labours of two antiquaries,—Dodsworth and Spelman,—by finishing the arduous undertakings they had commenced; but, with due allowance for this help, the amount of work he accomplished is incalculable. "What Dugdale hath done is prodigious. His memory ought to be venerated and had in everlasting remembrance," wrote Anthony à Wood, enthusiastically.

#### PATTERSON MEMORIAL CHURCH, PHILADELPHIA.

This church, built from the designs of Mr. Theophilus P. Chandler, jun., is of grey granite, with a red slate roof and red terra-cotta crests. It is characteristic enough, as an example of the "return to first principles" which seems to be the aim of some of the American architects of the present day.

dotted lines, the existence of a number of massive piers on the site of the walls of the cella. Mr. Wood's conjecture was that those piers had been built to carry the walls of a church built in later times. But there was no other indication of the existence of such a church, and it was unlikely that the plan of the church would have so closely followed that of the destroyed temple. The lecturer thought it was more probable that the massive piers in ques-



Patterson Memorial Church, Philadelphia.—Mr. Theophilus P. Chandler, Jun., Architect.

#### ON THE ARCHITECTURAL REMAINS OF THE ARCHAIC TEMPLE OF ARTEMIS AT EPHESUS.

THIS was the subject of a paper read by Mr. A. S. Murray, of the British Museum, at a meeting of the Hellenic Society on Monday last, Mr. E. Maunde Thompson in the chair.

Mr. Murray began by alluding to Mr. J. T. Wood's patient and successful excavations at Ephesus,\* and said that on the plan in his book that gentleman had indicated, by means of

tion had formed the supports of the walls of the great temple erected in the time of Alexander the Great. One thing quite certain about them was that in building them, free use had been made of the fragments of the older temple,—the temple which was burnt down on the night of Alexander's birth. Fragments of the old frieze and cornice were built in like so many bricks, and the piers were so solid that Mr. Wood could only break into them by blasting, obtaining, as a result, a number of archaic fragments. That was in 1874; but two years earlier Mr. Wood discovered some fragments of the same archaic character, not built into piers, but loosely mixed with sculpture of a later age. These archaic fragments obtained by Mr. Wood were now in the British Museum, and one of the results of the lecturer's efforts to put them together was now to be seen in the piece of cornice in the Archaic Room. In this restoration it was not claimed that every fragment was in its exact place, but the fragments had been put in their relatively true

places, with the view of showing what the cornice of the old temple was like. The result was a cornice in which the spaces between the lions' heads, where the rain on the roof escaped, were occupied, not by floral ornaments (as in the later temple, and in Greek architecture in general), but by groups sculptured with such extraordinary minuteness and delicacy that Mr. Wood could not at first believe the reconstruction possible; but a few moments' consideration and comparison of measurements convinced him that the restoration was right. The cornice, as restored, no doubt lacked the graceful profile of later cornices, but Mr. Penrose said that was a defect not altogether without precedent. As regarded the designs represented by the sculptures, it might be supposed either that they had formed a continuous subject, separated into groups by the lions' heads, or that they had consisted of an extensive series of separate subjects, in the manner of metopes. In either case such a separation of sculptured groups might throw

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\* See "The Temple of Diana of the Ephesians," *Builder*, Feb. 10, Feb. 17, and Sept. 14, 1872. For "sketch plan" of the temple, and for view of the remains of columns *in situ*, see the *Builder* for Feb. 10 of the same year. For other articles and information on the subject, see *Builder* for the following dates, viz., March 1, 1873; Jan. 27, 1877 (paper by the late James Ferguson), Feb. 3, 1877, Feb. 24, 1877 (review of Mr. J. T. Wood's book on the subject); July 29, 1882 (paper by Mr. Wood); Oct. 21, Oct. 28, and Nov. 25, 1882; Oct. 20, 1883; May 17, May 24, May 31, and June 14 (paper by Mr. Wood) 1884; Jan. 3, 1886 (article by Mr. Wood); June 12, 1886; &c.



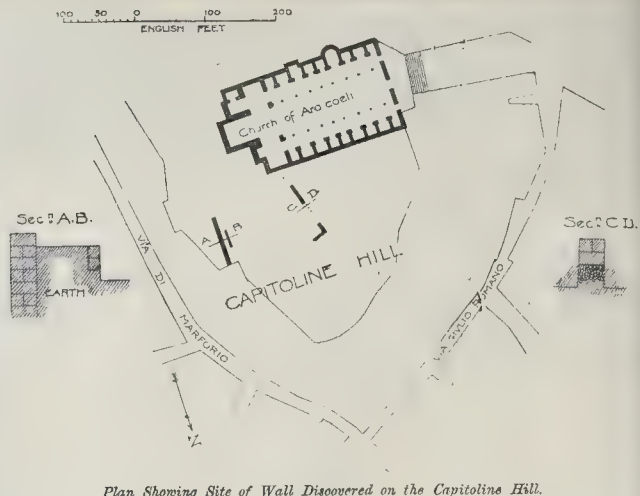
some light on the origin of metopes. The figures were on a rather smaller scale than those of the Harpy Tomb, and more minutely finished. The date usually assigned to the Harpy Tomb was about 550 B.C. The cornice of the temple was probably of about the same period.

Among other fragments of the archaic temple discovered by Mr. Wood were some which had been known for a while as remains of sculptured columns. It was known in a general way that the sculptured columns—*columnæ colate*—which adorned the temple of Alexander's time,\* had been copied from those of the older temple, not necessarily as regarded the subjects, still less as regarded the style, but in the general idea. Parts of one of these archaic columns had now been put together, and the result would shortly be seen in the Archaic Room of the Museum. As regarded the figure on the lowest drum, it answered fairly to the Hermes on an archaic vase from Corinth in the British Museum. Under the feet of the figure was a flat band, which did not exist in the later temple. Next came a *torus* moulding, as in the later temple, but smaller. In the restoration of this moulding Mr. Murray said he had employed two fragments which, according to a quite obvious conjecture, were inscribed with the name and dedication of Kresos. He was guided to that by a large piece of unfinished base moulding in the Museum, on the upper edge of which was carved a *torus*, exactly the same as that of the inscribed fragments. Finding several pieces of that upper member finished with horizontal flutings, but incomplete at the top, he had placed the inscribed fragments above one of them. They agreed perfectly. It would be recollected that the base of the later temple in the Museum had a fluted member of the same character, and with the same number of horizontal flutings,—namely, nine. The profile, however, was quite different, as would be expected in architecture of such widely-different dates. Finding that up to this point the new temple had in general copied the old, Mr. Murray decided, after an unsatisfactory experiment, to try whether the remaining base of the new temple might give a clue for restoring the lowest part of the archaic base. Among the archaic fragments he found a number of pieces which answered perfectly to that idea, and the result was a general resemblance between the new and the old bases, though there were many points of detail in which the one differed from the other. The sculpture of the archaic columns was, as far as he could judge, of the same period as the cornice. Mr. Murray then went on to speak of further fragments of the archaic temple, including some pieces of fluted columns, a large piece of a shaft, and a small piece of a lowermost drum with an inscribed *torus* moulding indicating a dedication, but whether by Kresos or not could not be said. As he was not proposing to deal with the whole question of this archaic temple, but only with such parts of it as appeared to have been made out, it would be enough to mention further that the British Museum possessed a stone from the *cella* wall and several fragments which had enabled Mr. Elsey Smith to restore the capital and necking of a column. On one of these fragments were remains of strong red colour. On another, a hollow line running round the volute had been filled in with lead, and gilded. On a third, the canal of the volute, instead of being hollow, was raised, as in the capital of the archaic temple at Samos. In the course of some further remarks, Mr. Murray expressed his indebtedness to Mr. Elsey Smith for making the drawings illustrating the restoration of these fragments. The architect of the archaic temple was, for a while, Chersiphron. The sculptures were probably by Bupalos, a son of Archemos.

Mr. R. Elsey Smith having made a few remarks in explanation of the drawings, Mr. Murray read an interesting paper on "Early Etruscan Paintings," in which he described five painted slabs of terra-cotta which have recently come into the possession of the British Museum. These were stated to be considerably older than the somewhat similar slabs in the Louvre.

After a brief discussion, in the course of which the Chairman congratulated Mr. Murray on having obtained these painted slabs for the Museum, the meeting came to a close.

\* The sculptured drums found by Mr. Wood were illustrated in the *Builder* for September 14, 1872, and (to a smaller scale) on June 12, 1886.



Plan Showing Site of Wall Discovered on the Capitoline Hill.

#### FORTRESS-WALL DISCOVERED IN THE CAPITOLINE HILL.

On the peak of the Capitoline Hill, opposite to the Temple of Jupiter, Capitoline, and in which is now in progress the building for the monument of King Victor Emanuel, was recently discovered a most important piece of fortress-wall, built of large tufa blocks, seven courses high, set at the edge of the perpendicular scarp rock (see plan, fig. A.B.).

This peak of the hill was called the *arx*, or citadel, and on it stood a large temple to Juno Moneta. It probably occupied the sites of the present church and monastery of Ara Coeli, the floor of which is about 14 ft. higher than the summit of the opposite peak. The other existing remains of the ancient wall which surrounded the Capitol are very well described in the section on the wall of Servius by Professor Middleton in his "Ancient Rome in 1885," p. 62. The most important piece of wall till now noted, was that five courses high, exposed on the rock above the Mamertine Prison, opposite the north-east end of the Tabularium, and built of soft, reddish tufa blocks. As in the Agger of Servius, the piece of primitive fortification recently discovered is composed of an exterior wall behind which is a bank of earth, supported by another wall, whose thickness is half that of the outside wall.

A second wall, built also of rectangular tufa blocks, has been found almost in the centre of the hill, which, from its position (see plan, fig. C.D.), undoubtedly does not belong to the original fortification of the *arx*.

My opinion is that this very ancient building belongs to Juno Moneta's temple foundations, of which, as yet, no remains have been discovered. L. B.

**Mural Tablet at Henbury.**—On the 14th ult. a mural-tablet to the memory of the late Rev. R. F. J. Shea, M.A., for thirty-eight years vicar of Henbury, Cheshire, was unveiled. It is in the Jacobean style, and of polished English alabaster, richly veined; the detached fluted columns that support the pediment being of polished red Devonshire marble. The inscription is borne on a slab of white statuary marble. The monument is the work of Mr. Harry Hems, of Exeter.

**Art and Industrial Exhibition at Bremen.**—During the summer of next year, an art and industrial exhibition will be held at Bremen. Exhibits, however, from Hanover, Oldenburg, and Bremen, being alone admissible to this section, but in another section the exhibition is invited of machinery, motors, implements, &c., used in the working of wood, leather, and metals, manufactured in any country.

**Letter from Paris.**—In view of the opening of the Paris Exhibition on the 6th, our usual monthly "Letter from Paris" is deferred till next week, so as to include in it some account of the opening ceremony.

#### Illustrations.

##### ST. CLARE'S CHURCH, SEFTON PARK, LIVERPOOL: INTERIOR.

THIS church is being built in Arundel Avenue, Sefton Park, and will accommodate about 600 people. Storeton stone is to be used throughout for the dressings and red deal for the roof. We hope to publish an exterior view and plan of the building shortly so as to clearly explain the whole. Our illustration is taken from a drawing in this year's exhibition at the Royal Academy, where the exterior view may also be seen. Mr. Leonard Stokes is the architect, and the builders are Messrs. Morrison & Sons, of Wavertree, Liverpool.

##### ILLUSTRATIONS OF THE REMAINS OF STRATA FLORIDA ABBEY.

The lithographs showing the remains of the west front and a number of details of carved work from Strata Florida Abbey, in Wales, are reproduced from drawings made by Mr. Worthington G. Smith as illustrations to Mr. Williams's monograph on the Abbey. They are further commented on in the second article of our present number.

##### NEWCASTLE-UNDER-LYME PUBLIC BUILDINGS.

We publish a view, with some details, of the south front of these buildings. The turret acts as extract ventilator to the School of Art and the Library and reading-rooms, and the smoke flues from the heating apparatus is carried up the centre of it in an iron pipe to cause rarefaction. The "rudimentary" turret-like projections—between the School of Art lights—are inlet shafts for cold air, which is thence conducted by large glazed earthenware tubes to the various hot-water coils, &c., in the art schools.

This portion, forming in reality the back of the buildings, is wholly executed in red brick, with bricked roof tiling, the sashes being painted white.

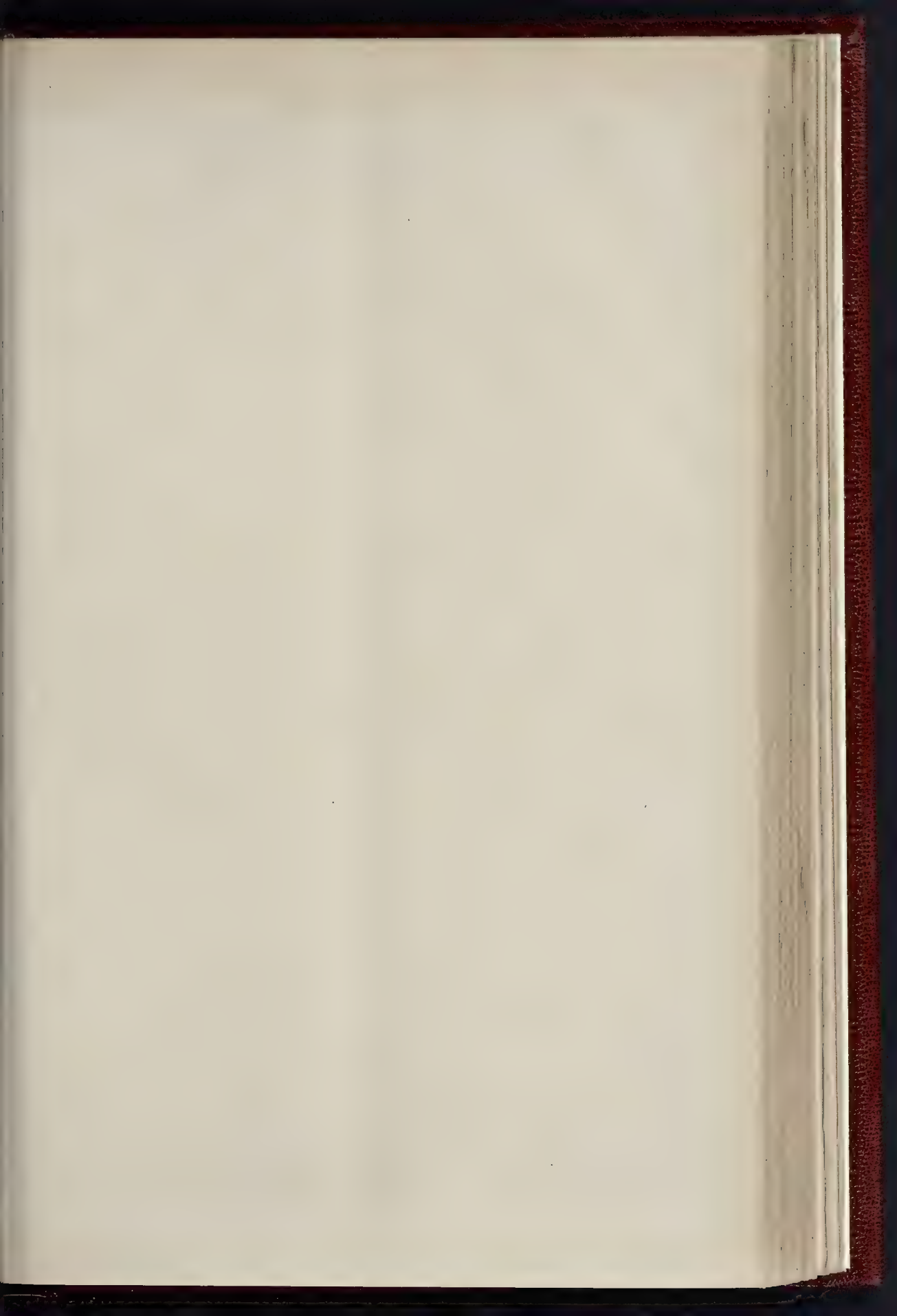
The joint architects are Messrs. Sugden, Blood, & Sugden, and Messrs. Chapman & Snape. Mr. John Gallimore, of Newcastle, is the builder; and the Borough Surveyor, Mr. J. Patten, is acting as clerk of works.

The heating and ventilation arrangements are being carried out by Messrs. G. N. Haden & Sons.

##### CEILING, BOURTON HALL, DEVONSHIRE.

This ceiling, of which we give an illustration, was designed for the owner of the estate by Mr. J. M. Boekbinder. It is composed of fibrous plaster and carton-pierre, and is in pure Louis XVI. style; the paintings have been done (according to Mr. Boekbinder's usual practice) on canvas, and put on (*marouflé*) afterwards.

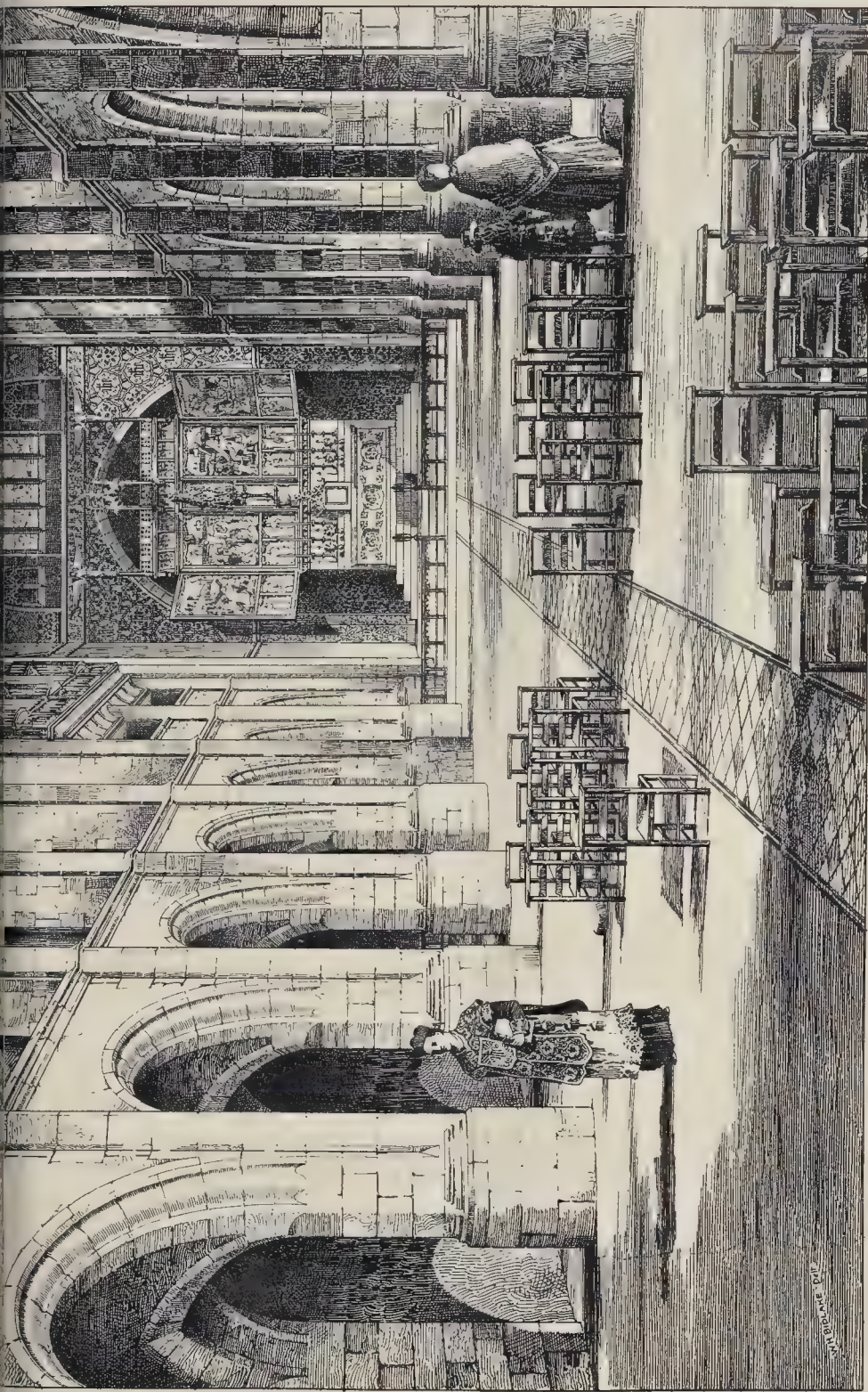




THE BUILDER MAY 4 1889





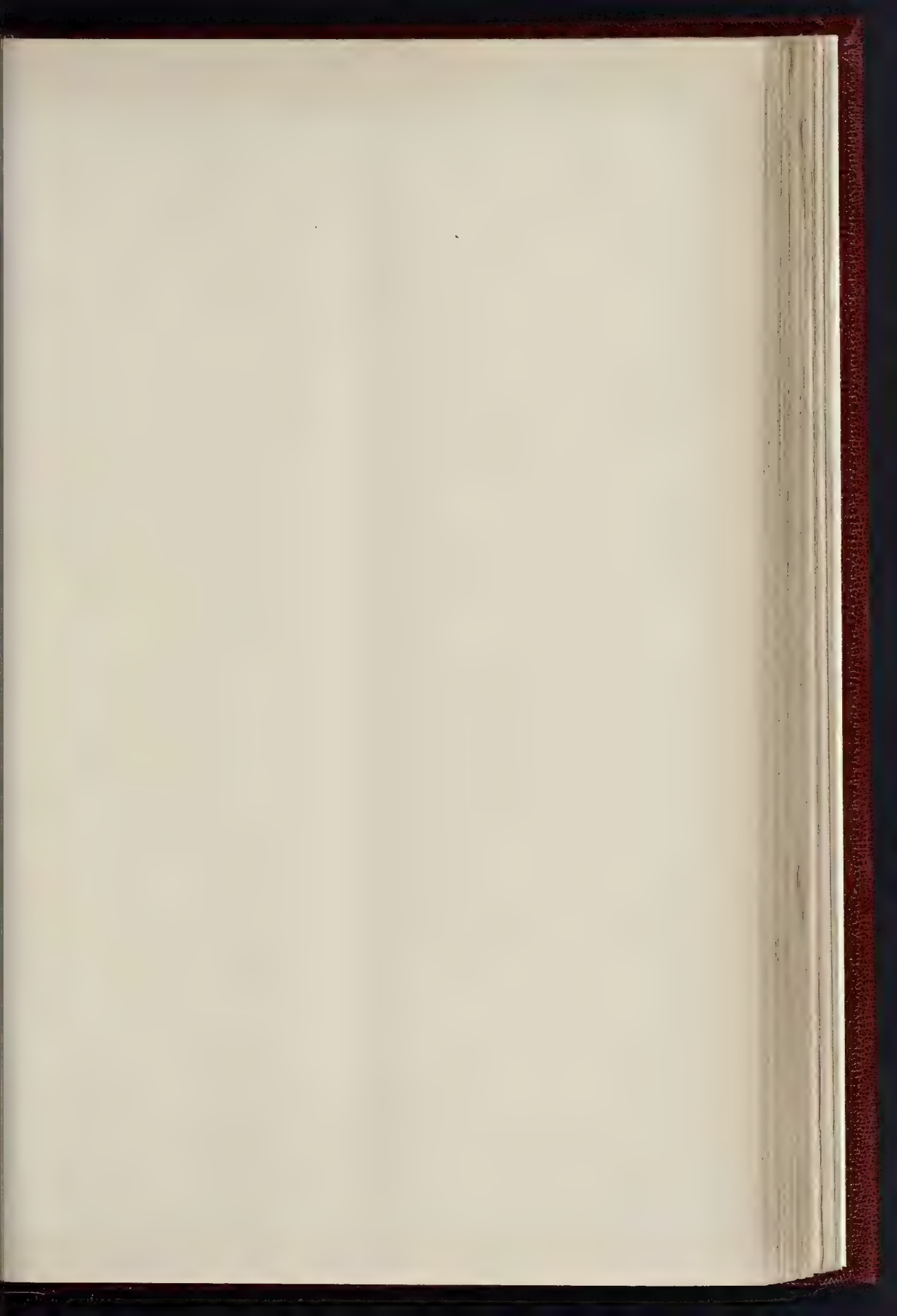


See 179, The Architect, 1871, Vol. 1, p. 179.

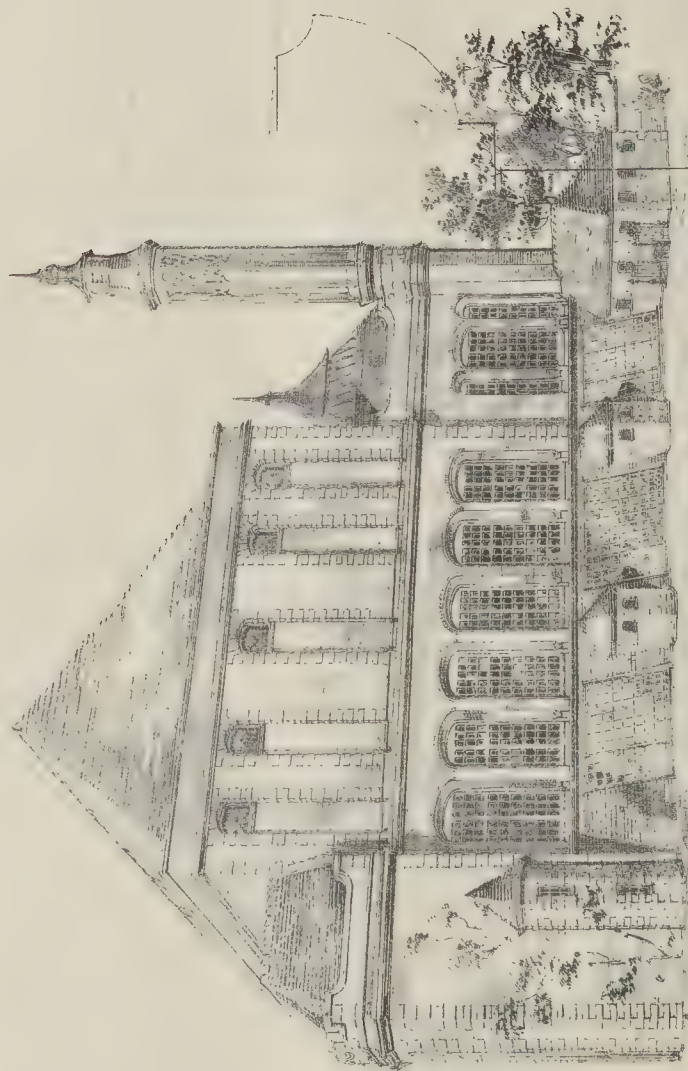
ST. CLARE'S (R.C.) CHURCH, SEFTON PARK, LIVERPOOL.—MR. LEONARD STOKES, A.R.I.B.A., ARCHITECT.  
INTERIOR VIEW.







THE BUILDER, MAY 4, 1869.



A VIEW FROM NORTH-EAST

Detail of  
Brick panelling  
in Burret:



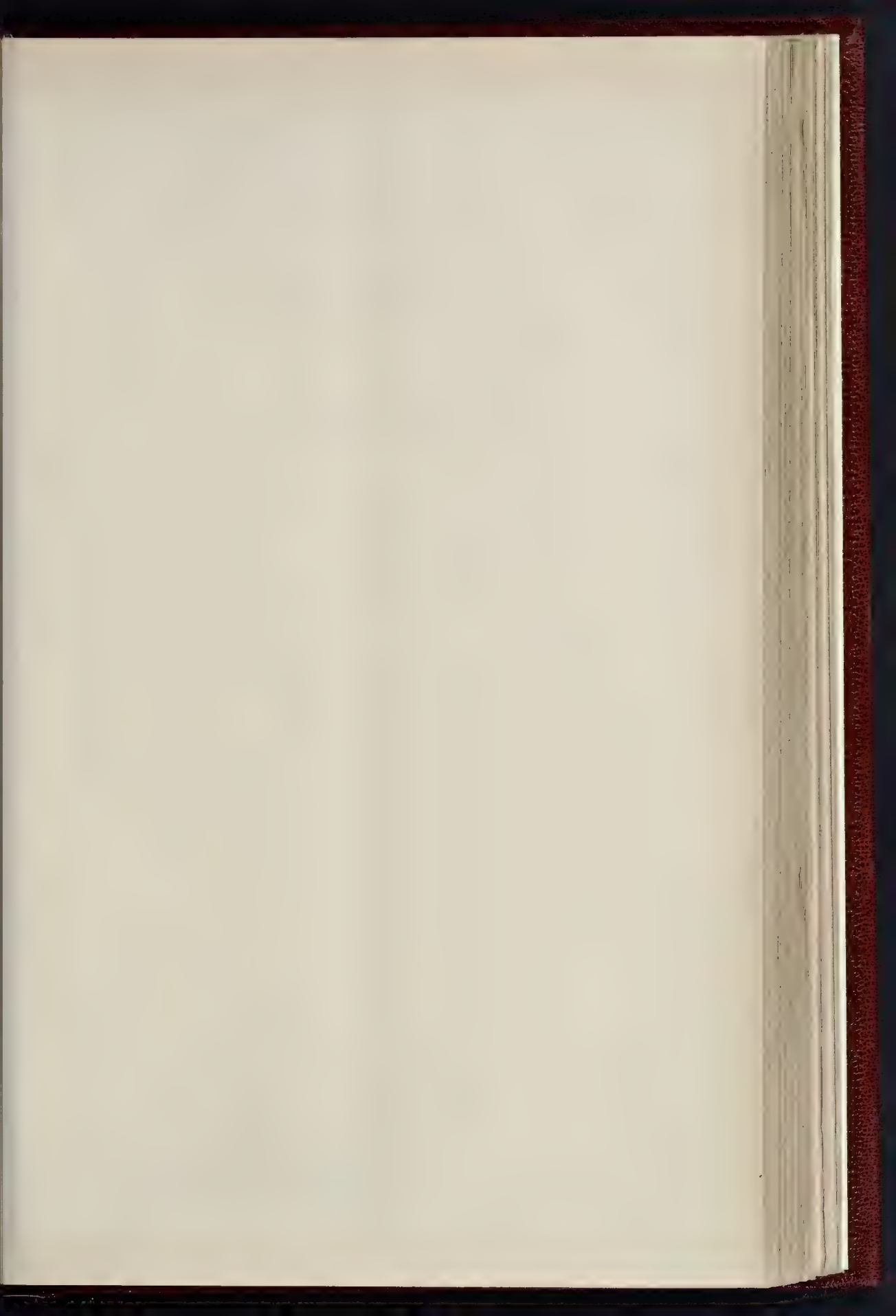
*Newcastle under Lyme  
Public Buildings:*



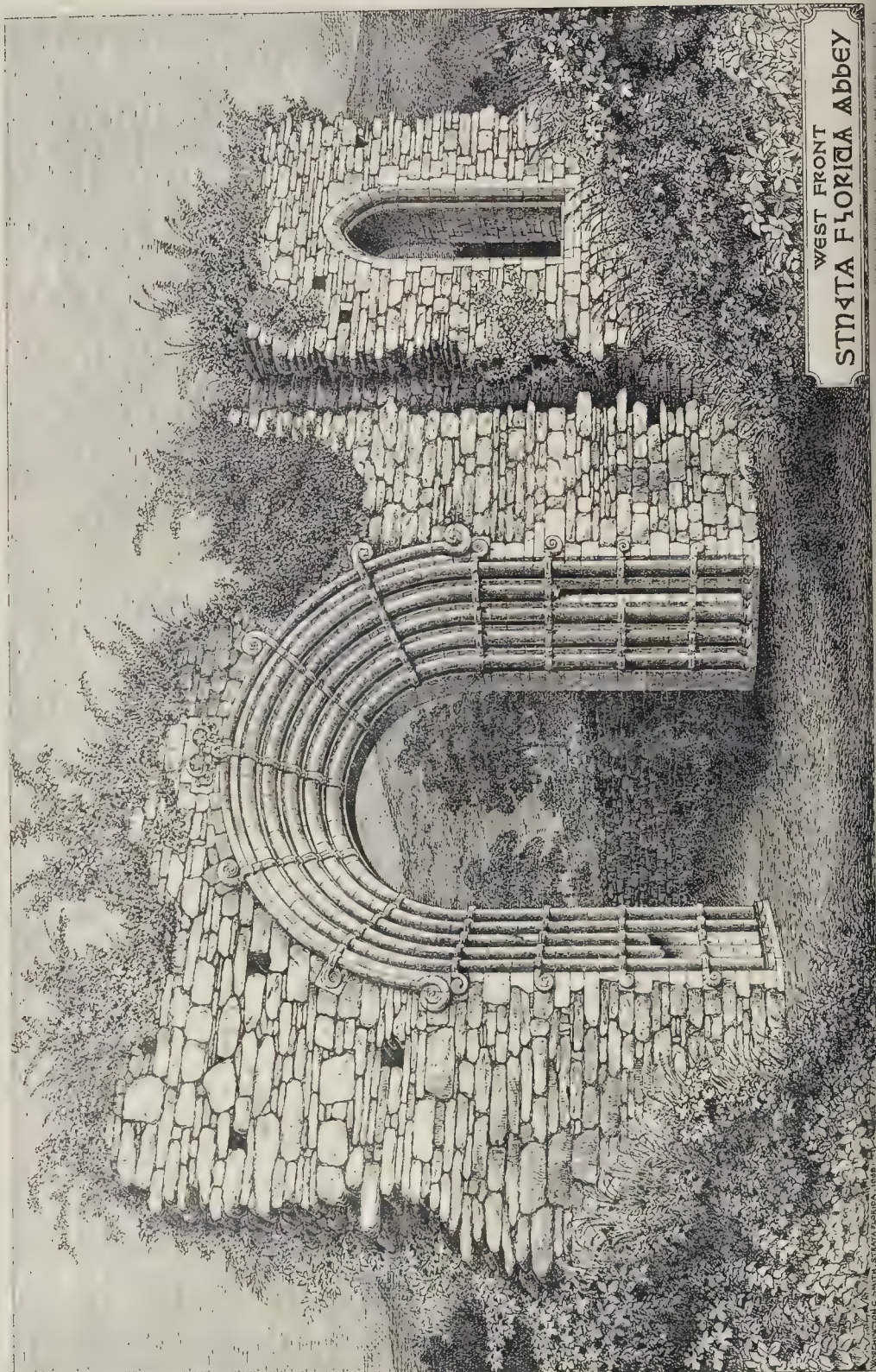








THE BUILDER MAY 4 1889



WEST FRONT  
SANTA FLORIDA ABBEY

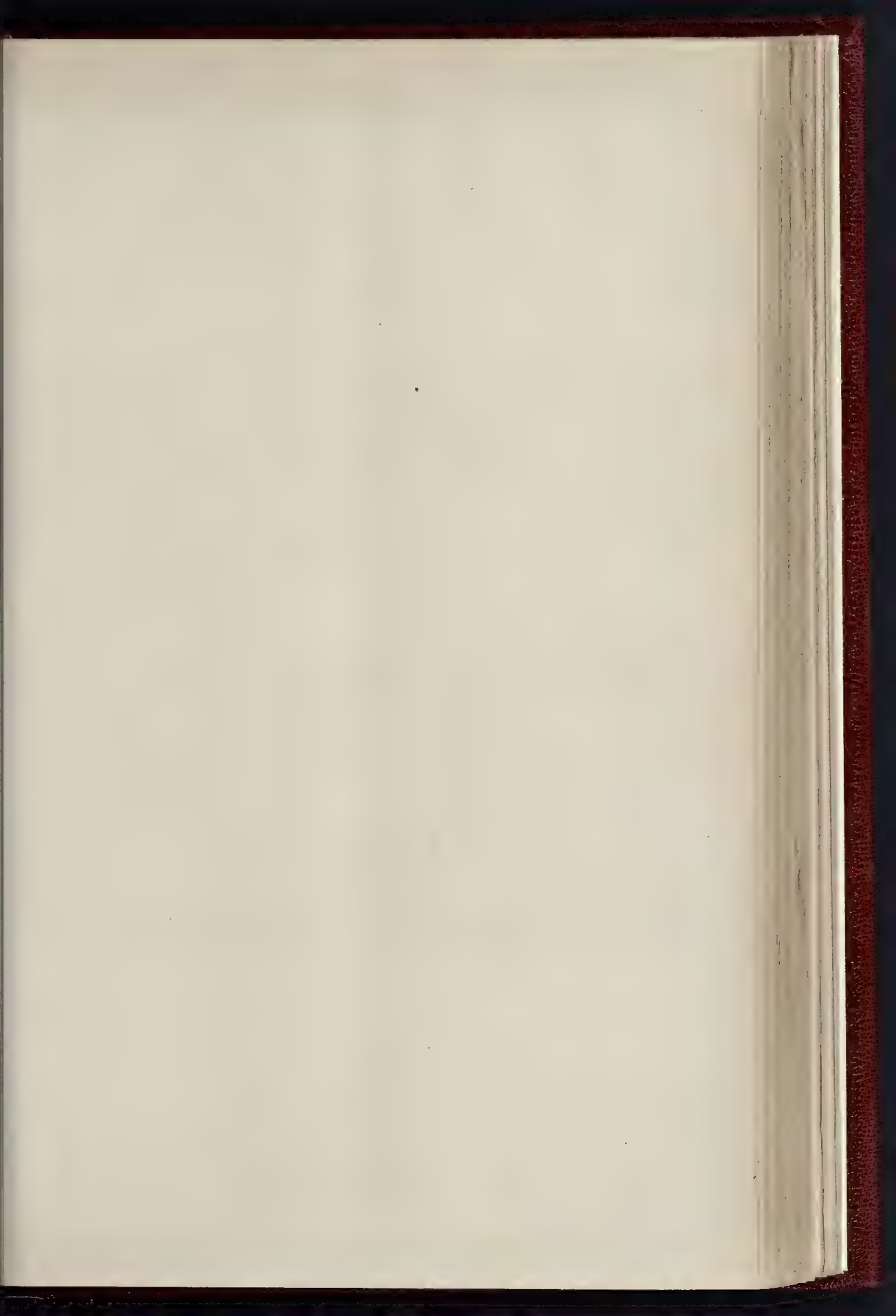


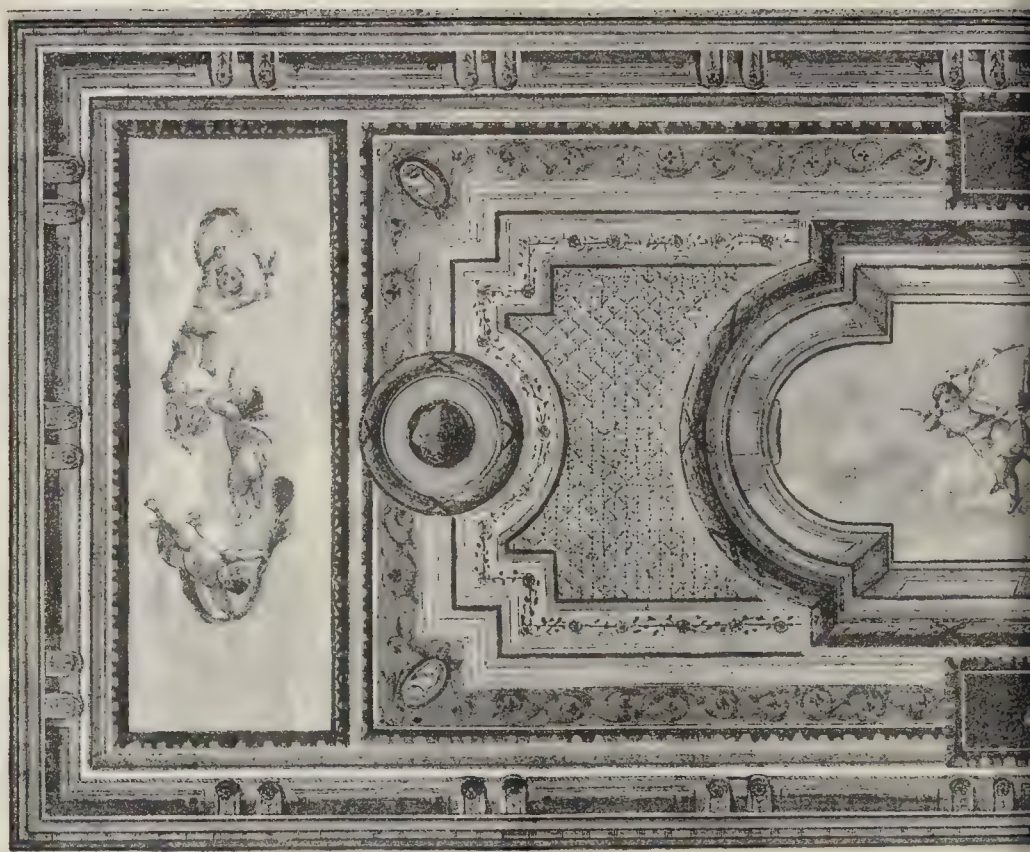


DETAILS, STRATA FLORIDA ABBEY.  
FROM DRAWINGS BY MR. WORTHINGTON G. SMITH.









CEILING, BOURTON HALL, DEVON









The two little panels coming between the painted frieze are flowers on a gold broken round, are also on canvas. The whole is 33 ft. y 15 ft. wide. The colours have been treated very delicately,—principally buff, pink, and old. The walls have been treated in harmony with the scheme, being all panelled out with mouldings, and the interior with carton-pierre ornaments in low relief.

The furniture is in carved wood, gilt, covered with a beautiful damask, and the carpet an exminster, specially designed all to correspond, y Messrs. Maple, under the artist's superintendence. There are also two fire-stoves in steel, gilt ornaments, and china plaques (Rose Jubary), manufactured by Mr. Florent chaeffer, of Antwerp.

#### THE ARCHITECTURAL ASSOCIATION: MEMBERS' SOIRÉE.

THERE was, as usual, a very large attendance of members of the Architectural Association at the Westminster Townhall on Tuesday evening last, the occasion being the annual *soirée* of the members. The principal item on the programme of the evening was the usual topical "play," which was described as "an original comedieta," entitled "Competition, or Much Ado About Nothing (as usual)." The dramatic persons were: The Bishop of Bustleham (a Colonial bishop), Mr. F. T. W. Miller; Mr. Pownceby Sharke, F.R.I.B.A., Mr. G. Richards Julian; Mr. Horatio Snodkins (his Assistant), Mr. O. G. Illmister; Mr. Joseph Bugsby (a builder), Mr. I. O. Cresswell; Mr. Snooks (a retired pork-butcher), Mr. J. H. Jacques; Hildebrand Illuminum Snooks (his son), Mr. A. C. Bulmer looth; Mrs. Snooks, Mr. C. H. Brodie; and Miss Sophonisba Sharke, Mr. Frank Galsworthy.

Scene I. is laid in the parlour of Mr. Snooks's residence, a jerry-built house which has been run up by Bugsby. The retired pork-butcher and his wife are discovered engaged in the preparation of what are known as "family jars," and in the midst of their wrangles there enters Bugsby, the builder, whose scamped work, manifest more or less all over the house, is made the subject of a sharp complaint by Mrs. Snooks, who characterises the work as "shameful, and ill dropping to pieces!" Bugsby, in a tone of injured innocence, replies: "Come! Fair's fair! Why, you've been in it a couple of years! You can't expect things to last for ever! How do you suppose the poor builder is to get a living?" Then, giving vent to his feelings in a song a parody of the "Gendarmes' Chorus" in *Généviève de Brabant* ("he sets forth the dodges" and successes of the jerry builder. The last verse of this lyric may be quoted as a specimen of the whole:—

"Then to make the front attractive,  
Little window-panes we make,  
Stick leaded glass into the windows,  
That's sure to make them take!  
And when the front's been all tuck-pointed,  
And it looks so nice and gay,  
We let 'em off, we sell 'em off, we let 'em off, we sell 'em off,  
In a most surprising way!

"We let 'em off, we sell 'em off, we let 'em off, we sell 'em off,  
And that's how we make it pay!"

Mr. Snooks having incidentally referred to the leaky state of the roof, Bugsby expresses incredulity, for, he says, "We put a hextra-thick gauge o' zinc on there! We put a No. 9 gauge n!" Snooks dismisses this disagreeable subject with the remark that "we can't expect to have everything; but perhaps the new County Council will manage these things better than the Board of Works has done, although, looking at the way they've begun, it doesn't look like it!" Mr. and Mrs. Snooks then ask Bugsby's advice as to what they shall do with their son, Hildebrand, who has a soul above the pork-butcher's business. Bugsby suggests, "Why not make him an architect?" Snooks asks, "Is that a good business?" Bugsby replies, "Yes, pretty good," though he proceeds to explain that it is not so lucrative as the trade of the builder, for whereas the builder gets 15 per cent. on the job, the architect only gets 5 per cent., though some of them obtain "pickings" in addition. While his anxious parents are discussing this question, the "young hopeful" enters, and he is informed of their intentions. His mother tells him that he will earn "lots of fees." "Fees?" exclaims the youth. "Pooh! I care not for them! Give me Art!" Bugsby, in an "aside," says that Hildebrand is very unlike a good many architects he knows,

and Hildebrand sings a song, "The Pilgrim of Art," to the air of "The Pilgrim of Love," the recitative commencing "Architecture, my beloved!" So ends Scene I.

Scene II. takes place in the interior of Mr. Pownceby Sharke's office, which is quite empty as the curtain rises. In a moment, Snodkins, Sharke's assistant, rushes in, fearful lest "the Governor" should have arrived first, for it is nearly 11 o'clock, and Snodkins is late. He soliloquises on the dull routine of his work, and sings "An Assistant's Lot is not a Happy One." The first verse was as follows:—

"Though a fellow's tied to dull routine employment,  
In taking in another fellow's plans,  
His capacity for artistic enjoyment  
Is just as great as any other man's.  
Our feelings we with difficulty smother,  
When architectural duty's to be done;  
Oh, take one consideration with another,  
An assistant's lot is not a happy one!"

While Mr. Horatio Snodkins is concluding this ditty, his principal arrives. Mr. Sharke twits his assistant with his cheerfulness, and expresses the hope that he does not waste his spare time and money on the A.A. smoking-concerts or Lyric Clubs. Snodkins replies that he doesn't get enough of either to be able to waste any. The following bit of dialogue then ensues:—

Sharke.—Any letters this morning?  
Snodkins.—Yes, sir. Here's one from Holland & Colls, asking for more details for that church.  
Sharke.—Details! What next, I wonder? Tell them they must make them themselves if they want any. They've got the eighth-inch scale drawings. What more do they want? I don't know what builders are coming to now!  
Snodkins.—But suppose they will have them? What am I to do?  
Sharke.—Let me see,—let me see,—it's a church they're building, isn't it?  
Snodkins.—Yes, sir.  
Sharke.—Then look out the details we had made of that Hall for the Tripeaslers' Company, and work them in somehow!  
Snodkins.—But they won't suit the style, sir!  
Sharke.—Oh, yes, they will! Tell 'em it's Byzantine, or something or other; they won't know the difference!

At this point, Bugsby enters, and broaches the subject of a new pupil, saying that he thinks he can bring "a good 'un,—a reglar clever one, who goes to the Association, yer know, and all that sort of thing." Sharke exclaims, "Why, he'll know more than I do!" which Bugsby, in an aside, thinks is very likely. It being determined that Bugsby is to have "the regular thing" for introducing a pupil, he presently returns, bringing with him Mr. and Mrs. Snooks and Hildebrand. Mrs. Snooks is the leading negotiator in this business, Mr. Snooks being nowhere. Sharke expresses his willingness to take Hildebrand as a pupil, "and the premium, of course!" After these preliminaries are settled, Mrs. Snooks bids an affecting farewell to her son, who is left talking to his Pecksniffian principal. The following is an extract from the dialogue:—

Sharke.—So, my dear young friend, you have come to study architecture, eh?  
Hildebrand.—Yes, Sir, if you please.  
Sharke.—It's a noble profession,—a noble profession!  
Hildebrand.—Do you understand it thoroughly, Sir?  
Sharke.—Oh, yes, my boy; oh, yes! But why do you ask?  
Hildebrand.—Oh! er,—I thought perhaps you could tell me why the tetrastrich intercommutation of the pre-Byzantine period varies in its ratio of divergence from the Glycophetic modulus of the Coptic ambulatory. I can't find any allusion to it in "Gwilt."

This poser Mr. Sharke is, of course, unable to answer, and he eludes the subject by calling upon Mr. Snodkins to initiate the new pupil "in the first steps of the glorious art of architecture." Snodkins says he shall be happy to show him "how to trace and mount paper." "The governor" then going out, Snodkins and the young pupil exchange confidences, Snodkins revealing his passion for Sophonisba, the lovely daughter of Pownceby Sharke, who presently enters, and at once shows in a marked manner preference for the manners and conversation of the new pupil, to the great discomfiture of Snodkins. The young lady retires from the office somewhat precipitately when she hears her father returning. Sharke is expostulating with his assistant for not yet having put the new pupil to work when a distinguished visitor is announced,—the Bishop of Bustleham. The bishop explains that he was on the point of returning to his diocese in Ipecacuanhaland, but it had occurred to him that he ought to make some arrangements about the buildings he proposed erecting:—

Bishop.—I may say that I was on the point of going to Whiteley's in the matter, but I was recommended to you.  
Sharke.—Was so it quite as cheaply as Whiteley's, my lord, and, I may say, quite as well!  
Bishop.—No doubt, no doubt.

Discussing matters more closely, Sharke says, in reply to questions, that he can "do a very nice red brick church in the Gothic style, roof and all complete, but exclusive of spire, at 3*l.* a sitting. "Queen Anne" would come a trifle more expensive, because there is so much green paint." After referring to schools and "a lovely thing in mission-rooms, just in," with quite the air of a draper's counterman, Sharke asks, "What about a cathedral, my lord?"

Bishop.—Well, I hardly know. Do you think it necessary?  
Sharke.—Oh, certainly, my lord. You must have a cathedral. They won't believe you're a real bishop if you haven't got a cathedral!  
Bishop.—True, true. I never thought of that! I should like to see some patterns or designs.  
Sharke.—We shall have to get one out for you; we don't keep them in stock,—there is so little demand just at present. I suppose you would not like a second-hand one? Or else we've a nice one just come back from Liverpool.  
Bishop.—I think I should prefer a new one, so perhaps you will get your design ready and I will call again.

After the bishop and Mr. Sharke have left the office, Snodkins and Hildebrand discuss the question, how will Sharke manage about the design for the cathedral? Snodkins opines that Hildebrand will have to get it out, whereupon Hildebrand exclaims that his chance to do something great has come at last. With more singing and love-making between Hildebrand and Sophonisba, the curtain falls on Scene II.

Scene III. discovers Sophonisba, alone, practising dancing in her father's office. So absorbed is she in her occupation that she is not aware, for a time, of the entry of the bishop. After the bishop has made his presence known by inquiring whether he is in an architect's office or not, the bishop and the young lady enter into conversation, and Sophonisba suggests that dancing would be a valuable accomplishment for the bishop,—one likely to soothe the heathen. The bishop, struck with the idea, offers to learn dancing, and he and the young lady dance a minuet. So fascinated is the elderly bachelor bishop with the graces of the young lady, that he falls on his knees to her, protesting his devotion. At this moment the couple are surprised by the sudden entry of Hildebrand, who, stung by jealousy, threatens to report the bishop to the Upper House of Convocation unless he gives him (Hildebrand) the commission for the cathedral. The bishop does not see how he can do that, seeing that he has promised it to Mr. Sharke. "Oh," says Hildebrand, "say that you have altered your mind, and that you will have a competition." The bishop agrees, and in due course Sharke gets a letter to that effect, and is loud in his lamentations. "I'm clean out of it!" he exclaims. Snodkins points out by way of consolation that the bishop asks Sharke to go in for it. At this, Sharke brightens up, and says that he must put Hildebrand on to it at once; but he is again much cast down and greatly enraged when he learns that Hildebrand has left the office because there was not enough "high art" there to please him. With characteristic audacity, he sends Snodkins to the bishop to say that the drawings for the cathedral are nearly done, and that he must take them. The bishop sends word back to say he will come at once to see them. In the meantime, Mr. and Mrs. Snooks have called, and are "having it out" with Mr. Sharke for his bad treatment of their son Hildebrand. Hearing a disturbance, Sophonisba rushes in, and discovering that Mrs. Snooks is the mother of "her dear Hildebrand," asks pitciously where he has gone to? Sophonisba informs her father that she loves Hildebrand, and her father, after at first setting his face sternly against the engagement of the young people, relents, having his own advantage in view in so doing,—for he sees he may get not only a son-in-law, but a talented partner. Hildebrand is sent for, and he returns flourishing a roll of plans,—a design for a cathedral. Mr. Sharke gets possession of the plans, on Hildebrand's own terms,—the hand of Sharke's daughter,—just in time for the visit of the bishop, who is charmed with the design, as containing "so much nature," and approves it on the spot, placing the commission in Sharke's hands. Bugsby offers to build the cathedral, and "to put good work in," and all the characters in the piece are expressing their determination to go to Ipecacuanhaland with the bishop as the curtain falls.

The piece was admirably played by all the actors in it, and in "make-up" each performer was most successful in masking his identity. In response to loud calls for "author," Mr. F. T. W. Miller appeared before the curtain and bowed his acknowledgments.



## ARCHITECTURAL ASSOCIATION VISITS.

The fifth sessional visit of this Association was made on Saturday last, to the new Church of St. James's, Spanish-place, of which Messrs. Goldie, Child, & Goldie are the architects. There was a good muster of members, who were shown over the building by the clerk of works.

The new church, being in the immediate vicinity of the old one, will continue to be known as the Spanish-place Church, although, strictly speaking, the new site is situated between South-street and George-street, Manchester-square.

The works now in progress will, it is expected, be completed in September next, but a further extension of the building eastward is contemplated, comprising a baptistery, which will be placed at the east end of the nave opposite the high altar, which is at the west end of the church, the tower and spire, with entrances, and also a mortuary chapel.

The church, which consists of a nave with four aisles, a large chancel with Lady-chapel on the north side, and sacristy on the south, with two small chapels in each transept, is externally faced with Portland stone, while internally Monk's Park stone has been largely used, with the caps, bases, and pilasters of Hopton Wood stone and Purbeck or similar marble for the detached columns.

The style adopted is a somewhat severe phase of Early English. The windows are all plain lancets, devoid of tracery, with the exception of the circular windows.

The triforium arches are semicircular, it having been decided to omit the subordinate arcade shown in the drawings.

Internally all the stone joints will be raked out and left unpainted.

The work is now finished to the level of the springing of the nave vaulting, which will be of stone.

Beneath the church is a large crypt which it is intended to utilise for class-rooms, &c. Access to this part of the building is gained by means of a stair from the church, in addition to which it can be easily reached from the presbytery building which will be situated on the George-street frontage.

The substratum on which the building stands is London clay, and the foundations are carried down about 12 ft. below the floor of the crypt.

The workmanship throughout is thoroughly good. One feature with regard to the construction of the main walls is worth noticing. As has been mentioned above, these are faced both externally and internally with stone; the core is formed of brickwork, while at frequent intervals a bed of concrete 12 in. thick is introduced as a horizontal bond.

## COMPETITIONS.

**Chelsea Free Library.**—The Chelsea Public Library Commissioners have received a series of competitive designs from selected architects, for the public library building to be erected in Manresa-road, King's-road, S.W., on a site given for the purpose by the Earl Cadogan, and have awarded the premiums to, 1st, Mr. J. M. Brydon, F.R.I.B.A.; 2nd, Mr. E. W. Mountford, A.R.I.B.A.; 3rd, Mr. C. Pemberton Leach, A.R.I.B.A. Mr. R. Phené Spiers, who was nominated for the purpose by the Council of the Royal Institute British Architects, professionally assisted the Commissioners in making the selection. The plans were on exhibition at the Chelsea Town Hall from Wednesday until today (Saturday) from 9 a.m. to 8 p.m. It is intended to erect the proposed South-Western Polytechnic on a site adjoining this library.

**Schools, Parkfield Middleton.**—In a limited competition for new schools, Parkfield Middleton, the designs submitted by Mr. Alexander Banks, Oldham, have been selected by the committee, and the work is to be proceeded with at once. The new buildings will be in the Perpendicular style of architecture, and are to be erected of local bricks, relieved with terracotta and stone dressings.

**Chapel, St. Mary's Abbey, Mill Hill.**—We are asked to mention that the bricks used for the interior of the Chapel of St. Mary's Abbey, Mill Hill, N.W., which was illustrated in our last, are the patent machine-pressed bricks made by the Brockham Brick Company during the past winter, and that the lime used was the same company's "Old Dorking."

## HEALTH CONGRESS AT HASTINGS.

ON Tuesday evening the Health Congress at Hastings was opened by an address given by Dr. B. W. Richardson, F.R.S., the President, who took as his subject "The Health of the Mind." He said that his audience were aware that all sanitary labours had been carried out under the conception that the success of their work consisted in detecting and removing obvious external causes of disease by and through which the bodily organs, including the organs of the mind itself, may be and are affected; but they were not so conversant with the study of the health of the mind primarily and independently of the body, and of the health of the body as dependent on that of the mind. He proposed, therefore, to dwell on this latter topic entirely, and to try to open up new thoughts in regard to it. In looking at causes affecting the health of the mind, they discovered, just as in respect to the physical health, analogies of the clearest kind. These were such as those well-known facts that the state of the body affected the state of the mind, and the state of the mind affected the state of the body. But what they did not feel and appreciate, and what they had to learn to appreciate, was the independence of the two empires of mind and body, as well as the dependency of the one on the other. They did not recognise with the same readiness, as in bodily health, the effect of the foods of the mind on the mind and its health; nor was this remarkable, for the body fed perceptibly, and by one stomach alone, whilst the mind fed imperceptibly by five stomachs, by every sense which was to it a veritable stomach. The sanitarian, in taking care that no evil or deleterious thing should enter the material, such as the pure food, the pure drink, the pure air, the pure warmth, out of which the body was built up, was performing his legitimate part on the physical side. But to complete his task he must add to his studies the study of the health of the mind, that luminous receptive surface which changed the mere material substance, the clay, and gave it according to its purity, innocence, and sanity, its approach towards the one pure and sane mind from whence it proceeded and to which it must return. In pleading for mental purity, the President said the feeding of the mind governed the appetite of the mind. Let the eye for a long series of years take in no view save that which was squalid, common, and impure; it would lose its primitive adaptability for art and beauty, and, after a set time for attaining maturity, would remain, in respect to purity of sight, a deformed mind—one that can at best be only partially improved. A mind so deformed was never in perfect health and strength. The difficulties sanitarians were daily compelled to meet in their work of reform lay beyond any description that could here be given of unhealthiness of mental visions. Those who from apathy of mind cherished the worst and most unhealthy errors asked why should the visions of their forefathers be altered. On minds so attuned argument was wasted. They need not argue; they must get the young mind to learn the scenes of the pure and the beautiful, and then their ultimate triumph was secure. Proceeding to give a practical idea bearing on this point of mental health, the President illustrated the schoolroom, where the first mental foods were administered. The first care of the teacher should be a bright, cheerful, healthy room, and then life began from a good mental starting-point. Let that room be dark, melancholy, and dirty, and the presage of life was injured from the starting-point. In this connection he maintained there was need for reforms in workhouse schools and the schools of the well-to-do, in the dismal cellars where the sunlight had not full play, in which no flowers were seen nor anything of beauty to gladden the sight. Passing on to speak of various curious forms of mental contagion and delusion, including suicide, the President observed that many of these belonged to a bygone rather than to the present age, but the lesson unfortunately remained.

On Wednesday, among the papers read was one on "The Status of Sanitary Inspectors," by Mr. Hugh Alexander, Chairman of the Association of Public Sanitary Inspectors of Great Britain. We give the following passages of this paper:—

As to the powers of a sanitary inspector. It is a popular delusion that it is the duty and within the legal power of a sanitary inspector to

require the abatement of a nuisance as soon as it has come to his knowledge. That is not so the strict legal function of a sanitary inspector is simply to inspect, and to report as to his inspections to the Local Authority, whose officer he is, who may, if they think fit (not shall), take action thereon. This very inadequate arrangement for the abatement of conditions injurious to the public health, was possibly a reasonable and, perhaps, a necessary cautious proceeding in the primary formation of a large body of officers who would be called upon to exercise their functions under a new order of things not only without experience in themselves, but with whose work it was necessary that the public mind should gradually be familiarised and educated into sympathy; but it has long been recognised that the legal obligation simply to inspect conditions injurious to health and report thereon to a Local Authority (perhaps at a distant meeting) did not, and could not, respond to the need or the demand of the public, nor satisfy the moral obligation which devolves upon a conscientious man in the discharge of the duties of a sanitary inspector.

Many inspectors have therefore of necessity, but entirely without legal authority, adopted the practice of serving notices requiring the abatement of nuisances as soon as they are discovered, and the necessity for this procedure is generally recognised, and, in the great majority of cases, where an inspector is supported by an enlightened Local Authority, his notices are attended to before he has an opportunity of reporting to his Board on the necessity which existed for serving them.

The public have in this way been familiarised and educated into sympathy with the labours of the sanitary inspector, and the inspector has developed in the long exercise of his duties; he is no longer an inexperienced and unknown functionary, from whom the legislature can with propriety, or without detriment to the public interest, continue to withhold the legal power to serve a notice to secure the abatement of a nuisance. On the contrary, he has become where he has been given fair play, the friend and the adviser of the people amongst whom he moves, and to fulfil the requirements of his position in a proper manner, he must now be something of a civil engineer, architect, builder, doctor, and lawyer, in order that he may be enabled to advise and supervise structural alterations, and in order that he may be enabled to detect and correct the errors and misdeeds of builders and builders' workmen, and diagnose and trace out the hidden causes of disease, and carry out the legal work of his office efficiently.

In addition to all which he must have some knowledge of men, for the right discharge of his duties with a minimum of friction.

If the measure and importance of the duties devolving upon a sanitary inspector are fairly apprehended from that statement, I will now invite you in the interests of the public health to consider with me the disabilities under which they are discharged.

To begin at the beginning, one would very reasonably suppose, if not informed to the contrary, that such officers would, under the law, and as a foundation for their position, possess one common, well approved, and honourable designation, but strange to relate that is not so. Under the 9th section of the Nuisance Removal Act of 1855, which formerly applied to the whole country, and which still applies to the metropolis, they are entitled Sanitary Inspectors; under the 133rd Section of the Metropolitan Local Management Act of the same year (1855), the same officers are (as though) were no consequence how they were named, classified as Inspectors of Nuisances. How the anomaly, that lack of co-ordination in rank under two contemporaneous statutes cannot be, is not very clear; it was possibly an oversight on the part of the legislature; but however it arose, it is very regrettable, as it appears in the Public Health Act of 1872 (section 189 & 190) to have led to the rejection of the name of Sanitary Inspector, and to the adoption of the less acceptable and the less generic title of Inspectors of Nuisances. This we submit, should be amended by a full recognition of the title of sanitary inspector.

As to the duties which devolve upon sanitary inspectors and the great want of legal definiteness thereof.—The 20th Section of the Sanitary Act of 1866, which formerly applied to the whole country, and which still applies to the Metropolis, declares as to inspection of nuisances:—"It shall be the duty of the Nuisance Authority to make an inspection of its district, to



ascertain what nuisances exist either by itself or its officers." And for the same purpose, the 22nd Section of the Public Health Act, 1875, which applies to the whole kingdom, excluding the Metropolis, declares, "it shall be the duty of every Local Authority to cause to be made from time to time inspection of their district, with a view to ascertain what nuisances exist." In the first-mentioned Act, the Congress may note there is an indefinite reference to officers, but, in the last-mentioned Act, there is no reference to officers at all; and, as this work of inspection is the peculiar work of the sanitary inspector, and of no other officer, we submit he should be distinctly named, and his duty in this, as in all other matters, clearly defined.

I have already in general terms referred to the fact that a sanitary inspector is under no legal obligation to make any effort to secure the abatement of a nuisance until he has reported thereon and received instructions from his Board; this will be seen by reference to Sections 93, 94, of the Public Health Act, 1875. Section 93 says, "Information of any nuisance under this Act in the district of any Local Authority, may be given to such Local Authority by any person aggrieved thereby;" as to which it is obvious that aggrieved persons do not require that it should be enacted that they may complain. The Section proceeds, "or by any two inhabitant householders of such district, or by any officer of such Authority, or by the relieving officer, or by any constable or officer of the police force of such district." Thus aggrieved persons, two inhabitant householders, relieving officers, and policemen are specifically named, whilst the sanitary inspector, the particular officer upon whose shoulders the whole business really devolves, is not designated at all; this is certainly remarkable enough in itself, but it is still more remarkable if it be considered that this section, which excludes in so marked a manner the name of the sanitary inspector, and even the nuisance inspector, is copied from the 10th section of the Nuisance Removal Act, 1855, which in its list of those who may make complaint to the Local Authority gives precedence to, and makes specific mention of, the sanitary inspector. It would be instructive, and it might be useful, if we could be supplied with the reason for this, amongst other retrogressive features of the Public Health Act, as they refer to, or omit to refer to, the position of the sanitary inspector. I now come to the consideration of initial proceedings as prescribed by law. Section 94 enacts that "on the receipt of any information respecting the existence of a nuisance, the Local Authority shall, if satisfied of the existence of a nuisance, serve notice on the person by whose act, default, or sufferance the nuisance arises or continues." This is conclusive that, to be strictly within the four corners of the law, the inspector's action must be confined to reporting or making complaint (as it is phrased in the Public Health Act) of each separate nuisance to the Local Authority, who, if satisfied thereon, shall serve a notice on the person causing the nuisance.

For this mode of procedure I have already said there might have been some apparent reason in early days, but having been adopted, its formula has been copied without reason in all subsequent Acts, e.g., Section 32 of the Sanitary Act of 1866 specifies "that where any Local Authority are of opinion, on the certificate of their Medical Officer of Health, that if the cleansing and disinfecting of any house, or part of a house, or articles in a house, would tend to prevent the spread of disease, it shall be the duty of such Authority to give notice in writing to the owner or occupier requiring the same to be done." Section 46 of the Public Health Act of 1875 would convey to an inexperienced person that such roundabout procedure is of great efficacy, as it sets forth the necessity for the certificate of the Medical Officer of Health as in the previous Act, and alternatively the certificate of any two medical practitioners, on receipt of which, if it appears to the Local Board that cleansing, &c., will be beneficial, they, the Local Authority, shall give a notice in writing to the owner or occupier requiring the same to be done. I submit to the Congress that while a law is allowed to exist, it should at least be possible to attain the purpose, to secure which it was framed, and by the process which it prescribes; but imagine a sanitary inspector fettered by such restrictions in the face of an epidemic of small-pox or cholera; in the first place he must call the attention and secure the certificate of the medical officer of

health, in every separate case, "where the cleansing and disinfection of a house or part of a house would tend to prevent the spread of the disease"; and according to the Public Health Act, if he cannot secure the medical officer's attendance, he must obtain the attendance and certificate of two medical practitioners; armed with the certificate of the one or the other, he must apply to the Local Authority when they next meet; then, if it appears to the Board necessary, they shall serve a notice on the owner or occupier to cleanse, &c., the premises. I need scarcely say that this procedure, which is only calculated to interpose delay where the utmost promptitude is needed, is utterly impracticable, and, being so, is generally disregarded, the practice being to serve notices at once as is most expedient, but for which practice there is positively no legal authority.

I now submit on behalf of the Council, that the interests of the public health demand that it shall be declared by law to be the duty of all sanitary inspectors to inquire into all complaints as to nuisances dangerous to health, and to inspect their district for the detection of nuisances dangerous to health; and in all cases where such nuisances are found to exist, it should be declared by law to be the duty of the sanitary inspector to serve a notice forthwith on behalf of the Local Authority, whose officer he is, requiring the abatement of such nuisances forthwith; and it should be declared to be the duty of the inspector to report to the Local Authority, or a committee thereof appointed for such purpose as to such nuisances, and also as to notices served on behalf of the Local Authority for the abatement of such nuisances, and if such notices be adopted and approved by the Local Authority, or only after such adoption and approval, it should be declared to be the duty of the inspector to proceed if necessary, and without further authority, against the person or persons causing or permitting the continuance of the nuisances.

I have now shown that the legal designation of inspectors is anomalous and conflicting, and I have also demonstrated that inspectors have no power of initiating proceedings by serving a notice for the abatement of a nuisance, and thereon I submit that the foundation is not truly laid, and that the whole superstructure of sanitary law is consequently defective and unreliable.

If the Congress agree with Her Majesty's Commissioners [on the Housing of the Working Classes] that only men who are acquainted with the principles of sanitation and of building construction should be appointed to the position of sanitary inspector, it will doubtless be conceded that such officers, giving all their time, energies, and special knowledge to the public service, should be liberally remunerated, but, unfortunately for the interests of the public health, every Local Authority in the kingdom is practically permitted to appraise according to the measure of its wisdom or unwisdom, the degree of qualification required in a sanitary inspector, and the money value of his services. How that operates may be appreciated by reference to a list of returns obtained by the Council of the Association some time back, from 225 officers occupying the position of sanitary inspectors throughout the kingdom, from a digest of which it appears that there were 30 men at salaries beginning at 10*l*. and under 50*l*., 59 beginning at 50*l*. and under 100*l*., 76 beginning at 100*l*. and under 150*l*., 38 beginning at 150*l*. and under 200*l*., 19 beginning at 200*l*. and under 250*l*., 2 beginning at 250*l*. and under 300*l*.. From consideration of these figures, it must be quite evident that there are many Local Authorities who are guilty of very flagrant evasion of the law, which requires them to appoint sanitary officers to safeguard the public health, for as they do not pay for the services which the public health demand, it is quite certain the service is neither rendered nor expected. We therefore submit that, in the matter of the salaries of sanitary inspectors, the principle of Local Representative Government can suffer a little violence with much advantage to the interests of the public health, and as the law requires sanitary inspectors to be appointed, we further submit it should also declare, in addition to specifying necessary qualifications, a minimum salary for such officers of at least 200*l*. per year.

As to tenure of office, there being no legal obligation to the contrary, many local autho-

rities elect their sanitary inspector, not permanently, but for various terms of one, two, and three years. This practice it is quite obvious, whatever a man's qualifications may be, or the amount of salary paid to him, is an effective and degrading check upon him in the discharge of his duty, between the members of his board and their friends on the one hand, and his self-respect on the other, he is on the horns of a dilemma. If he does his duty he is not re-elected at the expiration of his term. If, on the other hand, duty is restrained by personal considerations, his self-respect is sacrificed, and he has entered on a downward path. We therefore submit that sanitary inspectors should be elected to a permanent tenure of office, and should only be removable therefrom for misconduct, neglect of duty, or incompetence. In conclusion, I desire to say, on behalf of the Council of the Association whom I represent, that we disclaim any desire to invest inspectors with arbitrary powers, or any purpose to diminish the rightful authority of Local Boards over the officers whom they employ; and that, on the contrary, we believe, and are strongly of opinion, that it would be found, by such definitions and additions to the law as I have indicated, and which our experience has proved to be necessary, that whilst the efforts of sanitary inspectors in the interests of the public health would be rendered more effectual, the authority of Local Boards would also be largely increased thereby, and that sanitary law would be placed on a sound basis, and its administration entitled to public respect."

#### NATIONAL REGISTRATION OF PLUMBERS.

A PUBLIC meeting was held on Monday evening last, in the Civil Court, Town Hall, Leeds, to consider the means of extending to Leeds and district the system of registering qualified plumbers, and providing for their special training and examination, in view of the importance of securing the highest efficiency of plumbers' craftsmanship in the interests of the public health. There was a crowded attendance. The Mayor (Ald. Ward), the Chairman of the Sanitary Committee of the Leeds Corporation, occupied the chair; and amongst the others present were Mr. Digby Seymour, Q.C., and Mr. W. R. E. Coles (deputation from the Worshipful Company of Plumbers), Dr. Churton, Mr. H. B. Hewetson, Mr. G. Cornhill, Mr. J. Wreghitt Connon, Councillor Lee (President of the Leeds Mechanics' Institution), Councillor Ambler, Mr. C. England, Mr. George Wood, Dr. Goldie (Medical Officer of Health), Mr. T. Fairley (Borough Analyst), Mr. E. Yewdall, and Mr. J. W. Dixon. Letters regretting the inability of the writers to be present were read from Mr. T. Fridgin Teale, Professor Bodington, and Mr. J. Wertheimer (Leeds School of Science). We take the following report from the *Leeds Mercury* :—

The Mayor, in opening the proceedings, remarked that the meeting had been called entirely at the suggestion of the Leeds plumbers, many of whom desired that masters and operatives in the town should be registered. All householders knew something of the importance of plumbers' work, a good deal of which was hidden. Unfortunately, scamped work was sometimes met with. It was not an uncommon occurrence to come across plumbers' work executed in an unsanitary manner. By the registration of plumbers this might be avoided. In 1886 the Plumbers' Company initiated a system of national registration, and since then several district councils had been formed. The plumbers of Leeds now proposed that one should be formed for the borough and district (hear, hear). There was no doubt that the registration of plumbers would be greatly to the advantage of the public, for they would then be sure that the men they employed had some knowledge of the work they undertook to do. Registration would also benefit the plumbers themselves, as it would prevent incompetent workmen taking the places of those who were skilled. One condition in connexion with the scheme of registration was that a portion of the funds should be devoted to the spread of technical education. They might, he thought, expect to obtain assistance in that respect from the Yorkshire College and the Leeds School of Science and Technology (hear, hear). The probabilities were that registered plumbers would be able to command higher wages than those unregistered (applause).



Mr. Digby Seymour, Q.C., in the course of a vigorous speech, said that the Plumbers' Company received its charter in 1365, and the arms were granted by Queen Elizabeth in 1588. For many centuries the company limited its operations to London, but at length it determined to try and raise the position of the working and master plumbers, registration being decided upon. The company sought to educate the public and the plumbers in the importance of registration. By a system of examinations, it endeavoured to prepare a registry of plumbers, each man who passed the examination receiving a diploma which distinguished him from the uneducated plumber, and showed him to be qualified to be intrusted with any work which came under the head of sanitary plumbing. The plan had succeeded well wherever it had been heartily adopted. It was in force all over Scotland (applause). He hoped the time was not far distant when Parliament would give statutory authority for a line to be drawn in the case of plumbers as the Pharmacy Acts did in the case of chemists.

Dr. Churton proposed—

"That this meeting of the master and operative plumbers and others of the Borough of Leeds having heard the statements respecting the action of the Worshipful Company of Plumbers, London, with the view of bringing about a national system of registration of plumbers, approves of such a system of registration, and resolves (1) that a district council for the borough of Leeds, in union with the London Plumbers' Company, be formed to carry out such a system for that district; (2) that the council shall consist of representatives of the master-plumbers, the operatives, and of the public."

In doing so he observed that medical men took great interest in plumbing matters. Plumbers were quite as important as doctors, for prevention was always better than cure (hear, hear).

Mr. J. Wreghitt Connon, F.R.I.B.A., seconded. He was, he said, sorry that Leeds was a little late in the field in the matter of registering plumbers, but he hoped the scheme would now be taken up with such enthusiasm that the character of the town would be redeemed. He urged them not to stop until they had got an Act passed making the registration of plumbers compulsory (hear, hear).

Mr. H. B. Hewetson supported the resolution, which was eventually unanimously adopted.

Eight master and eight operative plumbers were then elected members of the Council, together with the Mayor, Dr. Goldie, Mr. Geo. Wood, Mr. C. E. England, Councillor Ambler, Mr. J. W. Connon, Councillor Loe, Mr. T. P. Teale, Mr. T. Hewson (Borough Engineer), and Mr. J. Newhouse (Sanitary Inspector), as representatives of the public.

Councillor Loe said that the subject of a class for plumbers had been considered by the directors of the Leeds Mechanics' Institution and School of Science. They endeavoured to form a class last year, but were unable to get a sufficiently skilled teacher. The committee had had a meeting that evening, and had decided that they would hold a class if the plumbers cared to make use of the institution, provided the council they had formed rendered assistance in procuring qualified teachers (applause).

Votes of thanks to the deputation for attending the meeting, and to the Mayor for presiding, brought the proceedings to a close.

On Saturday evening, April 27, at the Brighton Town Hall, the Mayor of Brighton (Alderman Sendall) presented the certificates to those plumbers who have passed the test examination of the Worshipful Company of Plumbers, London, in connexion with the National Registration of Plumbers. There was a large attendance of members of the Brighton Corporation, members of the medical profession, and architects, as well as master and operative plumbers. Representatives attended from Eastbourne, Hastings, Worthing, &c. Letters of regret from several public representatives were read. Alderman Farncombe, Mayor of Lewes, said it could not be too strongly impressed on the operative plumbers that it was to their personal advantage to spare no pains to make themselves thoroughly efficient.

The Mayor, in opening the proceedings, said that as an advocate of technical education he experienced peculiar pleasure in presiding on that occasion. There could be no doubt as to the vital importance of thoroughly training young plumbers so as to prepare them for successfully accomplishing their duties through life.

Dr. Ewart, president of the Sussex District

Council, said it was not sufficient for plumbers to have a practical knowledge of their work, they must also be thoroughly acquainted with the primary principles upon which their work was based. He referred to the classes which will shortly be started in connexion with the York Place schools, and which will afford plumbers an opportunity of obtaining the requisite instruction.

Councillor Turton said that as a member of the Sanitary Committee he looked upon all the plumbers who supported the present movement as coadjutors with him in his work, which had for its special aim the improvement of town sanitation.

Dr. Newholme, Medical Officer of Health, said he welcomed the adoption of the registration system (1) because it would raise the status of the plumbers' craft; and (2) because it afforded a safeguard to the public against unsanitary work.

At the examinations of plumbers for registration,\* held on Saturday last at the Guilds' Institute, applicants were present from various parts of London, as well as from Kent, Hants, and Devon.

The examinations embraced tests of joint-making, lead-laying, &c., and a set of questions relating to the qualities of materials, the construction of various forms of house-fittings, and the principles of sanitation.

The Examiners were Messrs. Charles Hudson, W. H. Webb, C. Taylor, H. E. Lobb, C. T. Mills, and R. J. Lyne (representative of the United Operative Plumbers' Association).

A little more than three-fourths of the applicants failed to pass the examinations.

[From this last statement, which is communicated to us officially, it is very evident that the work of the Plumbers' Company is a very necessary one.—E.D.]

#### THE LONDON COUNTY COUNCIL.

THE London County Council resumed its sittings, after the Easter recess, on Tuesday last, Lord Rosebery in the chair.

**Enlargement of the School Board Offices.**—The Finance Committee's Report, presented by Lord Lingen, in its fourth paragraph stated that the Committee had considered a letter from the School Board for London requesting an advance of £31,000, for the purpose of purchasing land for the extension of the Board's offices. The Committee had ascertained that the Education Department had sanctioned the borrowing of the money, and that that Department approved of fifty years as the period for repayment, recommended that the money be lent for that period, at £3.10s. per cent. per annum, the principal to be repaid by equal annual instalments. This was agreed to.

**Gardens and Playgrounds.**—The Report of the Parks and Open Spaces Committee, which was brought up and moved by the Earl of Meath, was as follows:—(1) Your Committee have had under consideration the question of the desirability of obtaining possession of certain gardens and playgrounds at present in the possession of voluntary associations. Your Committee are of opinion that all places of public recreation in London should gradually be brought under the control of the Council; and that, by a proper system, such places can be maintained by the Council at a moderate cost. They therefore recommend—

"That the Council do approve of the Committee taking steps for obtaining possession of or maintaining certain small gardens and playgrounds at present in possession of voluntary associations, such as the Kyrie Society and the Metropolitan Public Gardens Association."

2.—Your Committee have had their attention called to certain vacant plots of ground in Piccadilly-circus and Charing-cross-road, which they consider are suitable for open spaces; and they consider that, so far as the powers under the Act allow, such plots as are not already destined for other purposes should be laid out as open spaces. Your Committee recommend:—

"That the Council do authorise the Committee to take all necessary steps for laying out as open spaces the vacant plots of ground in Piccadilly-circus and Charing-cross-road, which are not yet destined for other purposes."

Mr. G. B. Holmes moved, as an amendment, that the first recommendation in this report be referred back for further consideration.

Mr. Firth, M.P., the Deputy Chairman, said that the second recommendation was *ultra vires*. The Council had at present no power to appropriate surplus lands to any such purposes.

Mr. Nathan Robinson wanted to know whether the gardens and playgrounds referred to in the first recommendation of the Committee were not at present kept open by voluntary and philanthropic effort? If so, he wished to know why the Council

\* One of our advertisement pages contains a long list of masters and journeymen lately registered.

should step in and relieve the Kyrie Society or the Metropolitan Public Gardens Association of work the cost of which those societies had hitherto borne?

Lord Meath said he was quite willing that the recommendations of the Committee should go back. But he wished it to be understood that the societies in question were not asking the Council to do them any favour. Those societies had, by the generous aid of their friends, obtained possession of and had laid out many comparatively small spaces, such as disused and neglected graveyards, &c. But having done that, they declined to keep them open for more than a limited time in the event of the local authority refusing to take possession of, and be responsible for, their maintenance. He was sorry to say that, owing to the refusal of the local authorities to maintain them, the Public Gardens Association would shortly close two such spaces. The work of the societies was to open and lay out such spaces, and then to hand them over to the local authorities. The Council was not asked to purchase them, nor to lay them out, for they were already laid out. If the Council took over the spaces referred to in the first recommendation, the societies in question would still continue their work of acquiring and laying out such spaces.

**Water Supply.**—Mr. James Beal brought up the report of the Special Committee on Water Supply, which they had submitted to the Council at their meeting, and had elected Mr. Beal to be their Chairman, proceeded as follows:—Your Committee have to report that they have proceeded, on the reference to them by the Council of March 19 (No. 8),

"To consider the steps to be taken, if they so advise, as to acquiring the undertakings for supplying London with water, whether such sources of supply should be reported on by the Engineers of the Council, and, if so, what time would be required for that purpose, having in view the fact that the Royal Commissions, such report to be presented not later than June next, in order to permit the requisite notices to be considered, prepared, and given in November for the ensuing session."

It appears to your Committee that the first step necessary to enable them to deal with this important matter should be the institution of an inquiry as to the whole question of the water supply of London. As such an inquiry would necessarily involve considerable expense, your Committee called upon the Solicitor of the Council to advise them as to the statutory powers possessed by the Council to expend money for such a purpose, and they were advised that no such power now exists. Your Committee have also ascertained that the Bill which has been prepared by the Parliamentary Committee for the purpose of conferring further powers upon the Council with respect to the water supply, provides for the introduction by the Council of Bills into Parliament on the subject, and for enabling the Council to defray the expense of making and carrying out inquiries and negotiations relating to such supply. In these circumstances your Committee have passed the following resolution:—

"That it be reported to the Council that as the Committee are advised by the Solicitor that the Council has no power to incur any expense in connexion with any inquiry into the matter referred to them, the Committee are of opinion that such inquiry must not be entered upon until the Council has obtained from Parliament power to incur the expenditure necessary in making such inquiry."

Your Committee, however, consider it desirable that the Council should be furnished with information relating to the question of the water supply of London, which is contained in a large number of reports of Commissions and Committees, and in various other Parliamentary papers, and they have directed the preparation of a digest of this information, with a view of its being furnished to the members of the Council.

The report was, therefore, by leave, taken back for further inquiries to be made.

**Housing of the Working Classes.**—The Committee on the Housing of the Working Classes, of which committee Earl Compton is Chairman, reported as follows: Your Committee, in view of the uncertainty which exists as to the powers of the Council to bring into operation some of the most important provisions of the Acts relating to the housing of the working classes, considers that the opinion of counsel should be sought on the subject, and recommends:—

"That the Solicitor be instructed to lay a case before counsel, and to arrange for a consultation, at which the Chairman, Vice-Chairman, and legal members of the Committee may be present, and that the following points be specially referred to in the case, viz:—

(a) Whether it is competent to the Council to put in force Cross's Acts and the Shaftesbury Acts simultaneously, exercising—i.e., with the consent of the Treasury—the compulsory provisions, and taking advantage of the compensation clauses provided by the former Acts, and the particular power to build lodging-houses given by the latter ones.

(b) Whether, in a case of general (as distinguished from local) importance, it is competent to the Council to concert measures with a Vestry, so that Torrens' Acts and Shaftesbury's Acts may both be made operative in respect of any particular area, the Vestry enforcing Torrens' Acts to the full against the owners, and the Council meeting or sharing expenses incurred, and purchasing or leasing, from or through the Vestry, such portions as may be acquired by the Vestry for the purpose of erecting lodging-houses.

(c) Whether an agreement is possible with a Vestry for the latter to enforce Torrens' Acts and the sanitary Acts



regard to any particular area, the Council agreeing to find accommodation for persons displaced elsewhere.

(d) Whether, and if any, what steps, can be taken by the Council on its own motion to enforce section 7 of the Housing of the Working Classes Act, 1885, and whether it is competent to the Council to give notice to a local authority requiring it to carry out sanitary works, and, failing the due execution thereof, to apply to the Court of Queen's Bench for a mandamus—in other words, whether the statutory duty gives a right of action to the Council as representing the public who are injured by the non-performance of the duty.

(e) Whether any, and if any what, provisions in Michael Angelo Taylor's Act (57 Geo. III., c. 29) are enforceable by this Council or other authority.

This was agreed to.

**Alleged Breach of Contract.**—The Main Drainage Committee reported that they had their attention directed to the fact that the contractor for the pre-nitration works at Crossness Pumping Station had, contrary to the terms of his contract, practically sublet the labour for the brickwork, and the Committee recommended that the penalty provided for this breach of contract be enforced in respect of one offence only.

Mr. Lemon moved as an amendment that the action be referred back, on the ground that the contractor had not been heard in his own defence. Mr. Burns stated that the proposal to enforce the penalty had been carried unanimously on the Committee. The decision had been arrived at on the report of the Engineer. The penalty proposed was £500, and he trusted the Council would unanimously adopt the recommendation, which could not fail to have a healthy effect upon all contractors. This would be the first time for thirty years that such a penalty had been enforced.

Mr. Marks said he hoped that the recommendation of the Committee would be unanimously adopted.

Mr. Rhodes (the Chairman of the Committee) stated that he differed from the Committee's proposal.

After some further discussion, a division was taken, with the result that the amendment was carried by 47 against 38.

After the transaction of some other business, the Council adjourned, after sitting four hours.

## THE PROPOSED WORK OF REPAIR TO THE CHURCH AT DAPHNE.

SIR,—With reference to your note in the *Builder* of the week before last, I can confirm to report that this church is in a state needing some careful repairs, but I cannot deprecate too strongly any proposal,—if, indeed, one is seriously induced,—to take down and re-erect in the Athens Museum the fine mosaic representation of the "Pantocrator." This is one of the very few churches left to us in which we can see that essentially Eastern church treatment of the dome decoration which was used by Justinian in his grand churches at Constantinople.

The church is attached to its ancient monastic buildings, which suffered much by being held in the Greek War of Independence as the fortified post on the "Via Sacra" at the Pass of Daphne. The buildings have recently been used as a madhouse, so far as they are habitable, but they are now deserted; and when returning from Eleusis last autumn, at sunset, I was unable to obtain admittance to the church, although many years ago I went over and examined it with my friend, Mr. Jarvis.

Possibly its lonely situation and its distance from Athens is one reason why it is thought better to put the mosaic in a place where it may be more generally seen: but one cannot but hope that the archaeological societies of Athens will repair and retain it *in situ*.

I am rejoiced to hear that the much-needed repairs are to be carried out, so as to preserve our utter ruin one of the most interesting Byzantine churches in Europe.

R. HERBERT CARPENTER, F.S.A.

## FIREPROOF FLOORS.

SIR,—In response to Mr. W. Lindsay's request I and you Mr. Stanger's report on the tests of my tubular lintels, from which it will be seen that the strength of my tubes bore more than double the load, and are of a far more uniform strength than a. It is true that, by the aid of the lateral flange, my tubes cover nearly two and a half times the space that his do, but two of his tubes are much larger in section than one of mine; any one comparing the two sections can see at once that the superior strength of my tubes is owing to the large size of the bottom or tension flange, aided by the lateral flange; this lateral flange also allows the concrete to bear direct on the lower flange of the joist, and form a lintel of concrete between each tube, supporting the concrete over, so relieving them of the load and the shock of anything falling on the floor. I think Mr. Lindsay will not deny that I initiated

this system of construction (my patent is dated April 25, 1888). I did not, however, make it publicly known until I was sure of its complete success.

MARK FAWCETT.

[COPY.]

## "Tests of Fireproof Bricks—Beams." (Supports 20 in. apart, loaded in centre.)

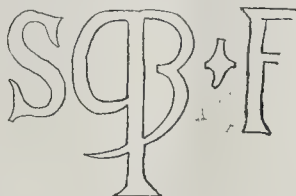
| Test No. | Breaking load in centre. |       | Calculated Stress on Outermost Layer. |       | REMARKS.                                   |
|----------|--------------------------|-------|---------------------------------------|-------|--------------------------------------------|
|          | Tons                     | Cwt   | Per sq. inch.                         | Tons  |                                            |
| 703      | 1'10"                    | 28'0" | 3135                                  |       | Fireclay. Supported on lip. Lip broke off. |
| 796      | 1'20"                    | 25'8" | 2890                                  | 0'313 | 701                                        |
| 797      | 1'52"                    | 30'4" | 3405                                  | 0'368 | 825                                        |

March 27, 1889. W. HARRY STANGER.

\* \* \* We cannot continue this correspondence further.

## INSCRIPTION AT WOLLATON HALL.

SIR,—Absence from home prevented my sending you the enclosed tracing, from a rubbing I have of the monogram P.B., before. My reasons for believing it to refer to Sir Percival and Lady Bridget Willoughby are, 1st, That it is joined to the word "Willoughby," and not separated from it



by a stop, whereas all the other words have stops between them; and, secondly, that the same monogram is, I am told, on an old chair which originally belonged to the Willoughby family.

Your correction of the word "inchoate" was quite right, as I find I have spelt it wrongly on my drawing. I enclose a copy of the inscription, one-fourth full size.

PERCY K. ALLEN.

## DRAIN-PIPE JOINTING.

SIR,—It may interest many of your readers to know that recently about 900 ft. of 9-in. Doulton "self-adjusting joint pipe" has been laid by us at the Ebor sewerage works to test this class of joint.

It has about thirty junctions laid in the length, and is perfectly water-tight, although it is laid with the subsoil water about 8 ft. above the culvert.

Should any of your readers interested in water-tight sewers wish to see it, we shall be pleased to instruct our agent to show them the length.

B. COOKE & CO.

## Proposed New National Library at Copenhagen.

Plans have been prepared for the building of a new national library at Copenhagen, and it is hoped that the Parliament will grant the requisite funds. The present library—containing some 500,000 volumes and 20,000 MSS. of great historical value—is located in a building adjoining the southern wing of the Christiansborg Palace, was built in 1673, and has never since been enlarged. The space is therefore terribly cramped, and, moreover, the literary treasures are far from safe from fire, so that if adequate protection be not afforded the Danish nation may sustain a severer loss than that of Christiansborg Palace.

**Sale of Kearney Abbey.**—By direction of the late Marquess of Ely's trustees, this property will be put up for sale at the Mart on June 21 next. It consists of about 100 acres in all, well watered by the river Dour, wherein is excellent trout fishing, and situated upon high ground between Ewell and River, near to Dover. The house was built for the late Mr. J. M. Fector.

\* We thought so; but it is odd that two independent correspondents should both have sent it to us with the same mistake, "inchoate."—Ed.

## CHURCH-BUILDING NEWS.

**High Wycombe (Bucks).**—A new church, known as Christ Church, was opened a few days since. It is of brick and stone, with slated and lead roofs, and is in the Early English style. It will seat 450 persons, and consists of a nave, 70 ft. by 37 ft.; chancel, 24 ft. by 12 ft.; and side aisles; organ-chamber, choir-stalls, and recess for font on the north; and vestry, &c., at the south-east. The main edifice is carried on detached stone columns with a hammer beam roof, the side aisles being arranged lean-to fashion outside the nave. The plans were selected in a limited competition, and are the work of Mr. Arthur Vernon, architect, High Wycombe. The builder was Mr. W. R. Loosley, of High Wycombe, and the total cost of the building has been about 2,500*l*.

**London.**—The laying of the foundation stone of St. Mark's Church, Noel-park, N. (the Shropshire Mission Church to East London), took place on Friday, March 29, 1889, by the Earl of Bradford, Lord Lieutenant of the County of Salop. The building stands detached on a piece of ground formed by the intersection of several roads, and will be seen principally from the main avenue of the estate. It is built on the model of a large parish church, accommodating 850 worshippers. On plan it consists of a nave, with side aisles, and north and south transepts, a choir and chancel, an additional south transept as an organ gallery, and a morning chapel in continuation of the north aisle. There are also clergy and choir vestries, and communication is provided direct to the mission hall, which is already built on the site before referred to. The nave is 88 ft. long by 26 ft. 8 in. in the clear; it is 30 ft. high to the roof-plate, and 50 ft. to the top of the ridge. The aisles are about 12 ft. 6 in. wide in addition. The choir and chancel are together about 35 ft. long, and of the same width as the nave. The morning chapel is 30 ft. long by 15 ft. wide, and is so constructed that it forms part of the church for full services. The building is treated in an extremely simple style, and is faced inside with red brick, Hammer Hill stone being sparingly used in the piers and caps of the nave and transept arches. The jambs of the chancel arch and windows are slightly emphasised, marble columns being used. An open timber roof runs through the whole length of the building, except over the sanctuary, which is slightly altered in form, and is boarded and panelled. The exterior is treated in a similar style to the interior, red brick being the principal material, with dressings of red Duffries stone; roofs covered with Broseley tiles. The church is built in Early English Gothic style. The design provides for the erection of a lofty tower, but this will not be built until special funds are provided for the same. The architect is Mr. Rowland Plunbe, F.R.I.B.A., and the contractors Messrs. Treasure & Son, of Shrewsbury and London.

**Milton-next-Sittingbourne.**—The work of restoring the old parish church of Milton-next-Sittingbourne, at a cost of about 1,000*l*, has just been commenced. In response to appeals for assistance liberal grants have been received from the Diocesan Building Society and other institutions, while the remainder of the required sum has been quickly raised by voluntary subscriptions. The restoration will be carried out under the direction of Mr. W. Leonard Grant, architect, Sittingbourne.

**Torrey (Torquay).**—The *Western Daily Mercury* reports that a confirmation by the Lord Bishop of Exeter was held at All Saints' Church, Torrey, Torquay, on the 10th ult., when the new bishop's seat was used for the first time. It stands within the sanctuary, and is of carved oak and of massive construction. The arms of the diocese, impaled with the Bickersteth arms, are carved thereon in high relief. This episcopal seat is the gift of a lady, and is the last work of Mr. Harry Hems, of Exeter. It will be remembered that the first portion (the chancel) of Mr. Pearson, R.A.'s, new church of All Saints was erected a few years ago. The *Mercury* states that the Rev. H. W. Majendie, the vicar, is now in a position to complete the whole edifice according to Mr. Pearson's original designs.

**Testimonial to the Lord Mayor.**—The commercial travellers' testimonial to the Lord Mayor, consisting of a marble bust of his lordship, by Mr. Onslow Ford, A.R.A., will, says the *City Press*, be presented at the Mansion House on Saturday, June 1.

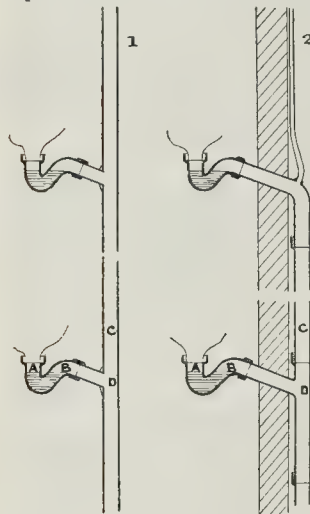


## The Student's Column.

## TOWN DRAINAGE.

## XVIII.—SOIL-PIPES.

THE siphonic action in some parts of house drainage, to which we referred in connexion with the so-called siphon trap, takes place in branches of a main pipe when the air-pressure in the main pipe is reduced below that of the atmosphere, if the upper end of the branch is exposed to this pressure. In the case of a water-closet above the ground-floor, the arrangement of the pipes which conduct the discharge from the basin to the drain is, first, a vertical pipe, called the soil-pipe, which may be, say, 4 or  $4\frac{1}{2}$  in. diameter, or more in some cases. A branch from this vertical pipe brings into it the discharge from each water-closet, when one is situated above another. Each of these branches has upon it a trap between the soil-pipe and the water-closet basin, as is represented by fig. 1. The surface of the water at A in the trap is subject to the pressure of the atmosphere, and also the surface B when at rest; for, although the areas of these two surfaces may not be the same, and the greater may have a greater total pressure than the other, yet, the pressure being the same per square inch, the water remains at rest in the trap.



The soil-pipe C is prolonged upwards, and is open to the atmosphere at the top. Let there be another such branch as that shown situated above it, and let the water-flush be discharged down the soil-pipe past the mouth of the branch D. The effect of that is to disturb the air around this mouth, a portion of it being driven down the pipe, compressing the air in front of the descending water and expanding it behind or above the water-flush, reducing its density and pressure. The body of water discharged may not fill the soil-pipe and act as a plug or piston within it, but yet it occupies a considerable part of the area of the pipe, and, besides, falling water carries with it some portion of the air with which it is in contact laterally, as well as that which it pushes in front of it, so that altogether the air immediately behind the water discharged from an upper closet is so much reduced in pressure below that of the atmosphere that the pressure on the surface of the water A overcomes that at B, and the water is forced out of the trap. It may be so wholly, or only in part, according to circumstances, but there is always the tendency to this siphonic action. To prevent its taking place, and thereby unsealing the trap, air must follow the discharge of water, with its full degree of pressure, as fast as the water falls; the portion of air carried away by the water must be replaced immediately from the reservoir of air above it, in order to prevent disturbance of the water in the trap; and the larger the pipe which conducts the air from the atmosphere above down to the point at which it is disturbed by the rush of water, the more quickly

is the balance of pressures restored. The action of the pressure on A tends to force the water out of the trap instantaneously, and if the air-pipe be too small, so that the portion of air in the soil-pipe which is carried away with the water is not instantly replaced, the siphonage takes place, notwithstanding that, at some short time afterwards, the air may have recovered its former density behind the falling water. Now, if the continuation of the soil-pipe upwards from the topmost branch into the reservoir of air above the house be too small to allow the air to follow the water closely, in sufficient volume and with the full pressure of the atmosphere, the time required for the due quantity of air to pass down the pipe is sufficient, though short, to give effect to the siphonic action in the trap.

Soil-pipes outside the wall have this advantage, that their defects are apparent to everybody, and not only to those who can examine them, as is the case when carried up inside a house, and the fig. 2 shows how attempts have been made to ventilate soil-pipes. Such cases may even yet be seen. They have been quite common.

In all these attempts at ventilation the primary object seems to have been to afford merely an outlet, or "vent" as it is sometimes called, for the air of the drain, where the drain and the soil-pipe are connected, or for that of the soil-pipe alone where it is disconnected at the foot; but an air-pipe above the highest branch of the soil-pipe acts in two ways: it ventilates the drain, or the soil-pipe only, as the case may be, and it also affords a passage downwards for atmospheric air to follow the discharge of water from branches into the soil-pipe. The importance of conforming the details to the action of air entering and passing along pipes may be seen in the fact that the obstruction to its free passage along the pipe arises from the confined space through which the required volume of air must pass, the pressure which urges it into and down the pipe being the difference of pressure between the air above the entrance of the pipe and that of the attenuated air immediately behind the falling water, the place of which is at some considerable distance below the top of the pipe; it may be 10 ft., 15 ft., or 20 ft., but whatever it is in any particular case, the following proportions hold good for different diameters of pipe:—

First, to compare five different diameters of pipes, all of the same length, —1-in., 2-in., 3-in., 4-in., and 5-in. diameter. If the required volume of air of atmospheric density and pressure descend the 5-in. pipe in 1 second, it will take  $1\frac{1}{2}$  seconds to descend a 4-in. pipe,  $3\frac{1}{2}$  to descend a 3-in. pipe, 10 to descend a 2-in. pipe, and actually 56 to descend a 1-in. pipe, the length in each case being the same, and the volume of air the same; tabulated thus:—

| Diameter of pipe | 5-in. | 4-in.          | 3-in.          | 2-in. | 1-in. |
|------------------|-------|----------------|----------------|-------|-------|
| Time             | 1     | $1\frac{1}{2}$ | $3\frac{1}{2}$ | 10    | 56    |

If, secondly, as much air as is required will pass down a 4-in. pipe in 1 second, and it be required to compare lesser sizes with this, then, if the required volume of air at atmospheric pressure descend the 4-in. pipe in 1 second, it will take 2 seconds to descend a 3-in. pipe of the same length,  $5\frac{1}{2}$  seconds to descend a 2-in. pipe, and 32 seconds to descend a 1-in. pipe, these being tabulated:—

| Diameter of pipe | 4-in. | 3-in. | 2-in.          | 1-in. |
|------------------|-------|-------|----------------|-------|
| Time             | 1     | 2     | $5\frac{1}{2}$ | 32    |

Besides the siphonic action above-named, there is another form in which it occurs. The air in front of or below the falling water-flush is compressed, and immediately before reaching the mouth of the branch D the excess of pressure is communicated to the surface of the water in the trap at B, while that at A is under the atmospheric pressure only, and the effect is to raise the water at A, momentarily, which, on the release of the excess of pressure on B, falls, and falls not only to its former level in the trap but below it. Having been forced up above its proper level its tendency is to oscillate until that level is reached again, but, on its first descent, a part of the water escapes over the bridge of the trap, leaving the water at A permanently lower than its former level. It may be so much lower as to unseal the trap, or not, according to circumstances, but in all cases the water is somewhat lowered, and this form of siphonic action is liable to be mistaken for the other one, as the cause of the unsealing of a trap under the conditions named. To prevent

siphonic action, in either form, the air-pipe and the soil-pipe below it must be of ample size.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

5,589, Ladders. N. Barker.

In order to connect two ladders in such a way that they may be readily extended, altered, or adjusted, without the method of splicing them, ropes commonly employed, an attachment is, by the invention, fitted to one ladder sliding inside another, which forms a clasp or clutch. These clasps engage the stave of the wider ladder beneath, and are fitted with projections which engage the front of the rail of the ladder, and are thus held securely in position.

7,031, Register Stove Grates. G. Wright. The "interior" of the stove which is the subject of this invention is fitted with a smoke-flue inclined forwards and downwards till it reaches about 3 in. from the back of the canopy in front, contracting the throat of the flue, for the purpose of quickening the draught.

2,918, Porous Terra-cotta. C. C. Gilman. The material which is referred to by this patent is made by mixing sawdust with the clay before it is burned. A cellular or sponge-like character is given to it, and it is called "terra-cotta lumber." This specification describes its application as a boiler covering, for which it is well suited, being cheap, durable, a good non-conductor of heat, and easily applied and removed.

2,919, Fireproofing Ceilings, &c. C. C. Gilman.

This invention consists in an application of similar substance to that mentioned in the foregoing paragraph to the purpose of fireproofing ceilings or buildings. Slabs or blocks are affixed to the joists by headed nails or screws, and the substance is afterwards plastered over, no joints showing in the wall or ceiling.

2,920, Construction of Roofs. C. C. Gilman. This is another specification in the series taken out by the same patentee, and describes the uses of "terra-cotta lumber" as a roof-covering, and the methods of fixing the blocks and cementing or otherwise fastening the same.

2,921, Fireproof Floors. C. C. Gilman. In fireproof floors and roofs constructed according to this patent, the beams and rafters are of iron or steel, and form a framework for the blocks or slabs, which may, if desired, be built in voussours, the usual methods being adopted.

2,922, Fireproofing Wood or Iron Posts. C. C. Gilman.

Here the posts or supports are surrounded or encased with the porous material. In the case of round columns, blocks are used, dovetailed in sections, and are nailed or screwed, forming an air-proof covering.

## NEW APPLICATIONS FOR PATENTS.

April 15.—6,393, P. Simon, Plate-glass.—6,394, G. Ewart and others, Metal Roofing.—6,417, J. Harris, Combined Window-fastener and Appliance for Removing the Sliding-sashes of Windows.—6,438, W. Schilling, Application of the Residues of Soda Manufacture for Building Purposes.—6,447, F. Coussell and others, Woodblock Flooring.

April 16.—6,504, B. Phillips, Water-closet Seats.—6,507, R. Evered, Door-bolts, &c.—6,517, G. Hayes, Fireproofing Buildings.—6,536, H. de Lespaze and H. Shafto, Plaster.—6,543, H. Algar, Locking or Fastening Sliding-sashes.—6,555, H. Allan, Kitchen Ranges.—6,573, S. Wilmot, Metallic Roofs.—6,584, G. King, Compounds to Restrain the Setting of Plaster, &c.—6,603, I. Sarginson and J. Noble, Chimney-cowl.

April 18.—6,653, E. Koster, Wood-carving Machine.—6,655, H. Heim, Fireplaces.—6,657, W. Bruce, Firegrates and Back-flap Ventilators.—6,687, R. Kenny, Plug for Drain-pipes.

April 20.—6,760, J. Sizer, Firegrates and Stoves.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

3,355, W. Hubbard and others, Wall-tiles, &c.—4,381, J. Parker, Moulds for Pressing Bricks, &c.—4,905, J. Tait, Self-closing Doors.—4,946, R. Clunies Bricks.—4,957, W. Lindsay, Bridges, Floorings, &c.—5,069, A. Liddell, Chimney-cowls, &c.—5,157, J. James, Manufacture of Cement.—5,281, P. Smyth, Chimney and Ventilating Cowls.—5,412, T. Ferguson, Ingredients for use as Mortar, Plaster, &c.—5,473, J. Clark, Glazier's Hacking Knife.—5,518, W. Peace and J. Coulthurst, Sanitary Socket-pipes.—5,790, W. Emden, Drain-pipe Joints.—5,803, A. Heath, Metallic Knobs, Mounts, and Terminal Ornaments.—5,846, J. Watkinson and T. Dodd, Gas-brackets, Chandeliers, &c.—5,900, H. Pegg, Sash-locks.—5,942, J. Oldroyd, Window fasteners.

## COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.  
8,945, B. Shillito, Earth or Dry Closets.—9,016, W. Parnall, Show-cases.—9,054, W. Peyton, Chimney Head or Pot.



RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 24.—By R. TIDY & SON.

153, Southgate-rd., ut. 42 yrs., g.r. 25, r. £44 p.a. 2425

By BAIL, NORRIS, & HADLEY.

bury Park — 4, Oakfield-rd., ut. 87 yrs., g.r. 225, r. £250 p.a. 435

ton, Benhill-rd. — A plot of land 200

By JONES & SON.

cliff — 1 to 8, Black Bull-court, ut. 60 yrs., g.r. £25, r. £97 10s. p.a. 80

10, and 11, Black Bull-court, c. r. £27 6s. p.a. 70

lar — 54, Manchester-rd., ut. 62 yrs., g.r. £3 12s., r. £23 8s. p.a. 60

APRIL 25.—By NEWSON & HARDING.

nton — 201, Queen's-rd., ut. 40 yrs., g.r. £21, c.r. £80 p.a. 590

ington — 146, Barnsbury-rd., ut. 34 yrs., g.r. £9, s.r. £45 p.a. 330

By E. STIMSON.

nington — 11 to 16, Fairfield-gr., ut. 41 yrs., g.r. £30, r. £239 4s. p.a. 1,430

rmoney-rd., ut. 40 yrs., g.r. £10, s.r. £100 p.a. 810

Belle — 1, public-house, r. £40 p.a. 450

terrace — 2 to 10 (even), Park-rd., ut. 49 yrs., g.r. £25, r. £154 14s. p.a. 900

£3 12s., r. £23 8s. p.a. 760

APRIL 27.—By MR. GAIGER.

w — 245, 247, and 249, Roman-rd., f. r. £180 p.a. 3,270

By F. CHRISTIAN.

lar — 19 and 20, Blair-st., ut. 68 yrs., g.r. £7 10s., r. £37 4s. p.a. 430

By NORTON, TRIST, & GILBERT.

itenham — 13, Bruce-gr., and 1a, St. 35p., r. £209 2s. p.a. 1,820

2, Bartholomew-close, f. r. £85 p.a. 450

£3 12s., r. £23 8s. p.a. 110

By P. HODSON.

rney — 27, Harvist-rd., ut. 53 yrs., g.r. £8 10s., c.r. £34 p.a. 250

Contractions used in this list.—F.g.r. for freehold land-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; s.r. estimated rental; ut. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; for square; pl. for place; ter. for terrace; yd. for yard, &c.

MEETINGS.

SATURDAY, MAY 4.

Association of Municipal and Sanitary Engineers and Surveyors.—Home Counties' District Meeting at South-point.

St. Paul's Ecological Society.—Visit to the Church of St. Mary Abbots, Kensington, to Hammersmith Parish church, and to Chiswick Parish Church.

Edinburgh Architectural Association.—Visit to Hadington and Leithington Tower.

MONDAY, MAY 6.

Royal Institute of British Architects.—Annual Business Meeting (Members only). 8 p.m.

Society of Engineers.—Mr. P. F. Nurey on "Recent developments in High Explosives." 7.30 p.m.

Clerks of Works Association (Carpenters' Hall).—Paper by Mr. W. Baker. 8 p.m.

Royal Institution.—General Monthly Meeting. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. H. Graham Smith on "Heat Engines other than Steam." I. 8 p.m.

TUESDAY, MAY 7.

Royal Institution.—Dr. Jean Paul Richter on "The Renaissance (Painting only)." II. 3 p.m.

Art Union of London.—Annual General Meeting and Distribution of Prizes, Adelphi Theatre. 12 noon.

Institution of Civil Engineers.—Mr. W. H. Greenwood on "The Treatment of Steel by Hydraulic Pressure, and its Plant employed for the purpose." 8 p.m.

Society of Biblical Archaeology.—8 p.m.

Birmingham Architectural Association.—Mr. J. W. Banks on "The Cross in Art." 8 p.m.

Glasgow Architectural Association.—Mr. W. H. M. Nab on "Modern American Architecture." 8 p.m.

WEDNESDAY, MAY 8.

Society of Arts.—Mr. G. Cluflow on "The Origin and manufacture of Playing Cards." 8 p.m.

Inventors' Institute.—8 p.m.

THURSDAY, MAY 9.

Society for the Encouragement of the Fine Arts.—Mr. Rhoad, F.R.S., on "Art Sketches in Travel to the East." 8 p.m.

Royal Institution.—Mr. E. Mynbridge on "The Science of Animal Locomotion in its Relation to Design in Art." 8 p.m.

Institution of Electrical Engineers.—Discussion on Dr. Lodge's paper on "Lightning, Lightning-conductors, and Lightning-rods." 8 p.m.

Society of Antiquaries.—8.30 p.m.

SATURDAY, MAY 11.

Architectural Association.—Visit to the Imperial Institute. 3 p.m.

Association of Public Sanitary Inspectors.—Major J. M.D. on "The Great Plague of London, with special reference to the Sanitary state of the Metropolis in 1665 and 1889." 6 p.m.

Gourock (N.B.).—The new waterworks here are approaching completion. The estimated cost is about £1,600. The engineer is Mr. Cooper, of Glasgow, and the inspector Mr. Ritchie; while the contractors are Messrs. Burnie & Stevenson, of Pollokshields.

Miscellaneous.

Street Improvements in the City.—A report giving the details of the various street improvements which have been carried out in the City during the past thirty-eight years has just been issued by Colonel Haywood, the Engineer to the Commissioners of Sewers. The total number of public ways now existing in the City is 731, and the Commissioners had effected improvements in 262 of them. Excepting King William-street, Moorgate-street, Holborn-viaduct and approaches, and Cannon-street, carried out by the Corporation; and Queen Victoria-street, which was carried out by the Metropolitan Board of Works, there is not a main thoroughfare in the City in which the Commission has not to some extent effected improvements. During the past thirty-eight years the Commissioners of Sewers had expended a sum of 3,900,000l. out of the Consolidated Rate for improvements in the City, and, in addition to this, the City paid one-eighth of the cost of the improvements carried out by the Board of Works. Amongst the improvements effected in the City during the past year are the completion of the widening of Duke-street, Aldgate, making a direct carriage-way between Bishopsgate and Aldgate, and helping to relieve the traffic which will pass over Tower Bridge when it is opened. The acquisition by the Post Office, under the compulsory powers possessed by the authorities, of certain property in the neighbourhood of Knightbridge-street, has led to the rounding and widening of several small thoroughfares in that locality. Nearly all the interests in the various outstanding properties in Ludgate-hill have now been acquired, and the complete widening of that thoroughfare between Creed-lane and Ludgate-circus will soon be effected. Of the four properties between Creed-lane and St. Paul's churchyard, one is already the property of the Commissioners of Sewers. Old Broad-street has been further widened, and notices have been served upon the owners of nearly a dozen other properties of the intention of the Commissioners to take them for improving the thoroughfare.

Association of Public Sanitary Inspectors.—Owing to the Health Congress at Hastings being held this week, the meeting of this Association, announced for Saturday next, has been postponed until Saturday, May 11, when Major Greenwood, jun., M.D., will deliver an address on "The Great Plague of London, with special reference to the Sanitary State of the Metropolis in 1665 and 1889." The Association has also issued a preliminary notice of the fourth annual provincial meeting, which will be held on Saturday, June 8, 1889, at Chelmsford (by invitation of the Mayor and Corporation). The Mayor (Mr. Frederick Chancellor, F.R.I.B.A.) will receive the Association in the Council Chamber at 10.30, and addresses will be given by Dr. A. Downes, D.P.H., Camb., General Inspector, Local Government Board, and Dr. Alfred Carpenter, J.P. After being entertained at luncheon by the Mayor, the party will reassemble at the Corn Exchange at 2 o'clock, and proceed to view the new Union Buildings, where the architect, his Worship the Mayor, will again address the members. The party will afterwards visit the Baddow Water Tower, and will be received by Mr. Councillor Whitmore and Mr. C. Pertwee, the engineers of the scheme. The party will next visit the Chelmsford Sewage Farm, and will be received by Mr. Alderman Durrant, Chairman of the Joint Sewage Committee. The system in use will be explained by Mr. C. Pertwee, the borough engineer. If time permit, a visit will also be made to the new waterworks.

New Opera-house in Stockholm.—A new opera-house is to be built in Stockholm, at a cost of about 140,000l. A syndicate has obtained royal sanction to the issue of mortgage bonds for 500,000l., redeemable in fifty-five years, with 2 per cent. interest, which will enable the handing over of the building free of charge to the State when finished, the project not being a commercial speculation, but framed and carried out by art patrons. The King of Sweden contributed 3,500l. The building will face the square of Gustavus Adolphus, and be situated close to the Royal Palace.

The Battersea Free Library.—The foundation-stone of this building, of which Mr. E. W. Mountford is the architect, was laid by Sir John Lubbock on Thursday last. We published a view and two plans of the building on Dec. 8 last.

The American Oil Fields.—An examination of the area and character of the American petroleum fields has shown that an oil famine, for the present, at any rate, is out of the question. The oil region, as now worked, extends from Wellsville, New York, across Pennsylvania, as far as Dunkard Creek, Western Virginia, a distance of 204 miles in a straight line, the oil belt being about ten miles wide. The yield of these oil fields up to March 1 last was 340,133,997 barrels. About 150,000,000 barrels of this quantity came from McKean county alone, and that county supplies at the present day 20,000 barrels a day. The figures and estimates given relate only to the region mentioned, besides Ohio, while Kentucky, Tennessee, Colorado, and California are not taken into account. It has been stated that the Ohio field might be made to yield 100,000 barrels a day, and this is not considered improbable, as the Bradford field, in July, 1882, yielded 105,102 barrels for every day in that month. But the Bradford field had no large wells which can at all compare with the geysers of Ohio. There is every indication that, both for illuminating purposes and fuel, the supply of oil will last for a very long time yet.

City and Guilds of London Institute for the Advancement of Technical Education.—The ordinary general meeting of this Institute was held at the Mercers' Hall, Cheapside, on Monday last, the Right Hon. the Earl of Selborne, the chairman, presiding. The chairman moved the adoption of the report, and referred to the flourishing position of the Central Institution, the Technical College at Finsbury, and the South London School of Technical Art. He gave details of the three Institutes as regards attendance. He said that while fully appreciating the generosity of the City companies generally, he thought the magnitude and importance of this work was such that it ought not to be allowed to languish for want of such additions as could be made, and which are required to prevent the work falling back. Everything was encouraging except the one matter of money, and he hoped the Corporation of London would see its way to remembering that it was at the head of all the guilds, and that the great work of this Institute is worthy of all the assistance that can be given to it.

The West Cliff, Ramsgate.—The Standard says that the Corporation of Ramsgate have, with certain modifications, accepted the offer of the War Office for a ninety-nine years' lease of the Government Acre on the West Cliff, at a rental of 5l. per annum, the conditions being that the Corporation should expend 1,000l. in erecting a sea-wall for the protection of the property, about a fourth of it having lately been carried away by encroachments of the sea. The War Office claims a right to resume possession during the first twenty years, on payment to the Corporation of 50l. per annum for the next twenty years after resumption. Not being desirous, for the sake of the residents and the visitors alike, of having this recreation-ground entirely closed to the public, or washed away, the Ramsgate authorities somewhat reluctantly agreed to the conditions offered, on the understanding that the 1,000l. to be expended should include not only a sea-wall but a zigzag path-way to the foreshore, sheltered seats, &c.

What is Water-gas?—Water-gas is produced by passing steam through burning coals, whereby the steam is decomposed and a gas is developed which is a mixture of carbonic oxide and hydrogen. The gas so obtained is inflammable, but although capable of giving out a great heat, its illuminating power is low. In order to raise this power, some twelve to fifteen pieces of ordinary white magnesium wire are suspended over the flame, and on these being raised to a white heat by the low-burning flame a strong, white light is obtained. The magnesium wires have to be renewed every 100 hours, at a cost of about five farthings per twenty-two candle light. The cost of production of this gas is said to be about 4d. per 1,000 cubic feet, plus the price of one ton of coals.

The Proposed New North-Sea Sound Canal.—Herr Glæser, the Danish engineer who proposes to construct a canal from the North Sea into the Sound, across Jutland, and the Limfjord, a project to which we recently referred, has petitioned the Danish Parliament for a subsidy of 500,000l. to be expended in constructing harbours at each end of the canal, it being the intention to make the latter by the aid of foreign money. A committee has been appointed to report upon the scheme.



**New Schools at Darlington.**—The new "Practising Schools" opened on the 12th ult., by the Hon. Lyulph Stanley, are built on half-an-acre of ground purchased from the Duke of Cleveland, and situated behind the Training College for Misses belonging to the British and Foreign School Society, and facing Trinity-road. The building comprises school-room, 48 ft. by 22 ft., for three classes of thirty girls each; a schoolroom, 28 ft. by 22 ft., for seventy-seven infants; and another room, same size, equal to a room for two classes of thirty girls each, but designed as a "criticism-room," that is, a room where one class of thirty girls or infants can be practised upon by the students from the college, each student being required by Government regulations to spend a few hours each term in teaching a class, whilst about a dozen students from the college take notes and write criticisms on such teaching. The chief features of the school are their lightness and airiness. The plan is arranged that each room has a large window at each end, throwing light at the right and left hands of the scholars, and none in the eyes of the teachers or scholars. The warming is by Boyd's hygienic open-air chamber fireplaces; the lighting by argand gas-lamps. The sanitary appliances are by Messrs. Adams & Co., sanitary engineers, York. The walls are all built with a cavity, for warmth and dryness, all of Walters' red kiln-burnt bricks, with a moderate amount of stone dressings. The roofs are covered with dark Welsh slates. The woodwork throughout (including dado round the walls and block floors) is of pitch-pine, all except the floors being varnished. The floors of class-rooms and lavatories are paved with mosaic tiles. The desks, which are all on the dual system, were supplied by the North of England School Furnishing Company. The cost of the buildings, including fencing-in the half-acre of ground and of asphaltizing the playgrounds, is about £1,920, or about £8. 4s. per head on the 227 children, which, according to the rules of the department, can be accommodated; but this is exclusive of site, and furnishing, and professional charges, which will bring up the total to about £2,500. The buildings have been designed by Mr. Pritchett, of Darlington (who was architect to the College), and has been carried out under his superintendence, assisted by his son, Mr. H. D. Pritchett, and the following are the contractors:—Brickwork, masons' work, and plasterers' work, Messrs. D. W. & M. Mackenzie; slaters' work, Mr. Wanders; joiners' work, Mr. R. T. Smith; plumbers' and glaziers' work, Mr. T. Tishman; painters' work, Mr. J. Metcalfe, all of Darlington.—For the alterations, additions, and new infants' school, at Albert-road Schools, the Darlington School Board have appointed Mr. Thos. W. Robson, of Darlington, as their architect.

**Sanitary Specialities.**—Messrs. Thomas Crapper & Co., of Chelsea, send us their new catalogue of sanitary specialities. The most note worthy item in it is "the improved 'Kenon' disconnecting trap" in which the flow of sewage is quickened by the passage of the trap being made egg-shaped in section instead of circular. Provision is made at the upper part of the trap (i.e., on the top of the upper arm, which is also provided with the usual inspection-cap at the end) for discharging into the sewer any accumulation in the inspection chamber caused by the accidental stoppage of the trap, should such occur. This provision consists of a gun-metal conical plug, fitting tightly into a seating made to receive it. The plug can be raised by means of a chain and pull fixed just below the man-hole cover of the inspection chamber. It is, of course, important that this plug should fit tightly into its seating, or sewer-air would be admitted into the inspection-chamber, and thence into the house-drains. It will, however, never be needed for use except when, from the stoppage of the trap, the inspection-chamber becomes full of sewage. In that event, the pulling-up of the chain and the raising of the plug will speedily empty the chamber, provided the stoppage to occur in the trap, and not beyond it.

**New Crematorium in Zurich.**—A large crematorium has just been opened in Zurich, the Municipal Council having granted space for the same in the public cemetery. The crematorium is built in the form of a Greek temple, with a columbarium attached. The furnace is constructed on M. Bourry's principle, whereby the flames do not touch the body, the latter being consumed by intense heat alone, the process occupying an hour and a half.

**The Edinburgh Naval and Military Exhibition.**—In reference to this exhibition, to which we have already referred, the  *Scotsman* (April 27) reports a meeting of the General Committee on the 26th, at which Colonel J. M. Trotter, Chairman of the Provisional Executive Committee, stated that, from letters received from a few contributors, it appeared some slight misapprehension existed regarding the exact nature of the forthcoming Exhibition, and he thought it might be convenient to explain the scope of the scheme. The small exhibition which was held last year in Edinburgh, and which proved so successful, was mainly archaeological, or, as explained in the advertisements and catalogue, one of naval and military relics and memorials. The exhibits were of great historical interest, but want of space and time made it impossible to arrange them on any definite system, historical or national. The present scheme is a much wider one. It was proposed to show the connexion of the past with the no less creditable present naval and military history of the United Kingdom, and, in short, to bring the subject up to date. For instance, in the class of Section II., which included British arms—an arquebus used at Halidon Hill, was of intense interest to all classes, military and civil, but it became infinitely more interesting and instructive when they could show how from it they advanced step by step through a long series of smooth bores and arms of precision to the Magazine rifle about to be issued to the troops. He stated that even comparatively young soldiers like himself could tell the meeting that they had learned their drill twenty or thirty years ago with the old "Brown Bess" converted to a percussion weapon, and that since that time they had worked with half-a-dozen rifles whose names were almost forgotten, and that now the rifle supposed to be the best in Europe, which was in use when they had to leave the service six or eight years ago, was in a fair way to be classed as a military relic or memorial.

**Helston Public Rooms.**—These buildings were opened on the 25th ult., by Mr. Wm. Trevenen, Mayor of Helston, in the presence of the Right Hon. Leonard Courtney, M.P.; Mr. T. B. Bolitho, M.P.; Mr. Bickford Smith, M.P.; Mr. W. A. McArthur, M.P.; the members of the Corporation of Helston, and many of the influential residents in West Cornwall. The buildings have been erected by a public company; but the object has been to provide an Assembly Hall, and rooms in connexion therewith, where public meetings and entertainments might be held. The site was granted to the company by the Duke of Leeds at the nominal rental of ten shillings a year. The buildings consist of business, billiard, reading, and caretaker's rooms on the ground floor, and upon the first floor a public hall and retiring-rooms. The walling is of Plymouth limestone; the dressings are generally of granite from the neighbourhood, some other parts of the work being of Douling stone, supplied by Messrs. Trask & Sons, of Dorset, Somerset. Messrs. Eva & Richards, of Helston, were the contractors for the works, which have been carried out under the superintendence of the architect, Mr. Charles E. Dyer, whose design was selected in open competition. The buildings stand upon the site of the old Helston Grammar School, where Charles Kingsley and his brothers and other eminent men received their early education. The school itself remains. It has been incorporated with the new buildings, and forms the reading-room.

**Royal Institution of Great Britain.**—The annual meeting of this Institution was held on Wednesday, May 1, 1889, Sir James Crichton Browne, M.D., LL.D., F.R.S., Vice-President, in the chair. The annual report of the Committee of Visitors for the year 1888, testifying to the continued prosperity and efficient management of the Institution, was read and adopted. The real and funded property now amounts to above £1,000, entirely derived from the contributions and donations of the members. Forty-five new members were elected in 1888. Sixty-four lectures and nineteen evening discourses were delivered in 1888. The books and pamphlets presented in 1888 amounted to about 296 volumes, making, with 570 volumes (including periodicals bound) purchased by the managers, a total of 866 volumes added to the library in the year. Thanks were voted to the President, Treasurer, and the Honorary Secretary, to the Committees of Managers and Visitors, and to the Professors, for their valuable services to the Institution during the past year, and the officers for the ensuing year were elected.

**Testimonial to Mr. Mark H. Judge, A.R.I.B.A.**—A committee, of which Dr. Farquharson, M.P., is the Chairman, has been formed for the purpose of publicly recognising the services of Mr. Mark H. Judge as Chairman of the Metropolitan Board of Works Inquiry Committee. With this end in view a meeting was held on the 30th ultimo, Dr. Farquharson, M.P., in the chair, when the following resolution was passed unanimously:—"That in the opinion of this meeting the close attention which Mr. Mark H. Judge has given to the affairs of the Metropolitan Board of Works since January, 1885 (when he first called attention to the improper disposal of the Pavilion Music Hall site), the untiring perseverance he displayed in refusing to be satisfied without a public investigation, and his action as Chairman of the Inquiry Committee, are services of such exceptional value as to merit some substantial public recognition. The treasurer of the 'Judge Testimonial Fund' is Mr. R. P. Nelson, Union Bank of London, Baywater Branch; Mr. J. C. Foulger, of 27, Maiden Lane, W., is the hon. sec. to the committee.

**Wire-wove Roofing.**—The prospectus of the 'The New Wire-wove Roofing Company' appears in our advertisement pages this week. We have on several occasions noticed this material, which possesses many advantages for exhibition buildings and other structures of a temporary character.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                                      |           | £. | s. | d. | £. | s. | d. |
|----------------------------------------------|-----------|----|----|----|----|----|----|
| Greenheart, B.G.                             | ton       | 8  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                                   | do        | 10 | 0  | 0  | 10 | 0  | 0  |
| Sequoia, U.S.                                | foot cube | 0  | 2  | 3  | 0  | 3  | 0  |
| Ash, Canada                                  | load      | 3  | 10 | 0  | 5  | 0  | 0  |
| Birch                                        | do        | 3  | 10 | 0  | 5  | 0  | 0  |
| Elm                                          | do        | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantais, &c.                            | do        | 2  | 0  | 0  | 3  | 10 | 0  |
| Oak                                          | do        | 2  | 10 | 0  | 4  | 10 | 0  |
| Canada                                       | do        | 5  | 10 | 0  | 7  | 10 | 0  |
| Pine, Canada                                 | do        | 3  | 5  | 0  | 4  | 0  | 0  |
| " yellow                                     | do        | 3  | 10 | 0  | 5  | 10 | 0  |
| Lath, Dantais                                | lathom    | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg                               | do        | 6  | 0  | 0  | 6  | 10 | 0  |
| Wainscot, Riga, &c.                          | do        | 2  | 15 | 0  | 4  | 5  | 0  |
| " Odessa, crown                              | do        | 0  | 0  | 0  | 0  | 0  | 0  |
| Deals, Finland, 2nd and 1st                  | std. 100  | 9  | 10 | 0  | 11 | 0  | 0  |
| " 4th and 3rd                                | do        | 8  | 0  | 0  | 9  | 0  | 0  |
| Riga                                         | do        | 7  | 10 | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow                   | do        | 11 | 0  | 0  | 15 | 0  | 0  |
| " 2nd "                                      | do        | 10 | 0  | 0  | 11 | 0  | 0  |
| Sweden                                       | do        | 7  | 10 | 0  | 10 | 10 | 0  |
| White Sea                                    | do        | 9  | 0  | 0  | 16 | 0  | 0  |
| Canada, Pine, 1st                            | do        | 16 | 0  | 0  | 28 | 10 | 0  |
| " 2nd                                        | do        | 11 | 0  | 0  | 17 | 10 | 0  |
| " 3rd, &c.                                   | do        | 8  | 0  | 0  | 10 | 10 | 0  |
| " Spruce, 1st                                | do        | 9  | 10 | 0  | 11 | 0  | 0  |
| " 2nd and 3rd                                | do        | 7  | 10 | 0  | 9  | 0  | 0  |
| N.W. Brunswick, &c.                          | do        | 6  | 15 | 0  | 8  | 15 | 0  |
| Battens, all kinds                           | do        | 6  | 10 | 0  | 20 | 0  | 0  |
| Flooring Boards, sq., 1 in., prepared, first | do        | 0  | 11 | 0  | 0  | 14 | 6  |
| " second                                     | do        | 0  | 8  | 0  | 0  | 10 | 9  |
| Other qualities                              | do        | 0  | 5  | 6  | 0  | 7  | 9  |
| Cedar, Cuba                                  | foot      | 0  | 8  | 4  | 0  | 0  | 4  |
| Honduras, &c.                                | do        | 0  | 8  | 4  | 0  | 0  | 4  |
| Mahogany, Cuba                               | do        | 0  | 4  | 2  | 0  | 0  | 4  |
| St. Domingo, cargo average                   | do        | 0  | 4  | 2  | 0  | 0  | 4  |
| Mexican                                      | do        | 0  | 4  | 2  | 0  | 0  | 4  |
| Tobacco                                      | do        | 0  | 4  | 2  | 0  | 0  | 4  |
| Honduras                                     | do        | 0  | 0  | 6  | 0  | 0  | 4  |
| Bor, Turkey                                  | ton       | 4  | 0  | 0  | 12 | 0  | 0  |
| Rosa, Rio                                    | do        | 15 | 0  | 0  | 20 | 0  | 0  |
| Salta                                        | do        | 14 | 0  | 0  | 18 | 0  | 0  |
| Satin, St. Domingo                           | foot      | 0  | 0  | 6  | 0  | 1  | 0  |
| Porto Rico                                   | do        | 0  | 0  | 9  | 0  | 1  | 3  |
| Walnut, Italian                              | do        | 0  | 4  | 6  | 0  | 0  | 6  |
| METALS.                                      |           |    |    |    |    |    |    |
| Iron—Bar, Welsh, in London                   | ton       | 5  | 5  | 0  | 5  | 10 | 0  |
| " at works in Wales                          | do        | 4  | 15 | 0  | 5  | 0  | 0  |
| " Staffordshire, in London                   | do        | 5  | 10 | 0  | 6  | 10 | 0  |
| Copper                                       | do        | 43 | 0  | 0  | 44 | 0  | 0  |
| British, cake and ingot                      | ton       | 44 | 0  | 0  | 45 | 0  | 0  |
| Best selected                                | do        | 44 | 0  | 0  | 45 | 0  | 0  |
| Sheets, strong                               | do        | 50 | 0  | 0  | 51 | 0  | 0  |
| Australian                                   | do        | 0  | 0  | 0  | 0  | 0  | 0  |
| Chill, bars                                  | do        | 37 | 0  | 0  | 38 | 0  | 0  |
| Yellow Metal                                 | lb.       | 0  | 5  | 0  | 0  | 6  | 0  |
| Lead, Pig, Spanish                           | ton       | 12 | 15 | 0  | 0  | 0  | 0  |
| English, common Brand                        | do        | 14 | 0  | 0  | 0  | 0  | 0  |
| Sheet, English                               | do        | 14 | 0  | 0  | 0  | 0  | 0  |
| SPRITZES.                                    |           |    |    |    |    |    |    |
| Silvan, special                              | ton       | 17 | 12 | 8  | 17 | 15 | 0  |
| Ordinary brands                              | do        | 17 | 10 | 0  | 17 | 12 | 6  |
| TRY.                                         |           |    |    |    |    |    |    |
| Banca                                        | ton       | 94 | 0  | 0  | 0  | 0  | 0  |
| Billiton                                     | do        | 93 | 0  | 0  | 0  | 0  | 0  |
| Strait                                       | do        | 92 | 15 | 0  | 0  | 0  | 0  |
| Australian                                   | do        | 91 | 0  | 0  | 0  | 0  | 0  |
| English Ingots                               | do        | 94 | 0  | 0  | 0  | 0  | 0  |
| Zinc—English sheet                           | ton       | 21 | 0  | 0  | 22 | 0  | 0  |
| OILS.                                        |           |    |    |    |    |    |    |
| Lined                                        | ton       | 18 | 12 | 6  | 18 | 17 | 6  |
| Cocanut, Cochín                              | do        | 27 | 0  | 0  | 23 | 0  | 0  |
| Ceylon                                       | do        | 25 | 0  | 0  | 25 | 10 | 0  |
| Palm, Lagos                                  | do        | 24 | 0  | 0  | 0  | 0  | 0  |
| Kapene, English pale                         | do        | 24 | 0  | 0  | 0  | 0  | 0  |
| " brown                                      | do        | 25 | 0  | 0  | 0  | 0  | 0  |
| Cottonseed, refined                          | do        | 24 | 10 | 0  | 26 | 10 | 0  |
| Tallow and Oleine                            | do        | 19 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S.                            | do        | 5  | 0  | 0  | 0  | 0  | 0  |
| " refined                                    | do        | 7  | 0  | 0  | 12 | 0  | 0  |
| Tar—Stockholm                                | barrel    | 1  | 2  | 9  | 1  | 3  | 0  |
| Archangel                                    | do        | 0  | 14 | 9  | 0  | 15 | 0  |





LONDON.—For repairs and decorations, &c., to the  
Cyprus Restaurant, Cheapside, E.C., for Mr. Wm. Kirk-  
land. Mr. Walter Graves, architect, Winchester-house,  
E.C.:

|                    |          |
|--------------------|----------|
| Simpson & Co.      | £26 0 0  |
| J. Mansbridge      | 152 0 0  |
| J. R. Hunt         | 180 0 0  |
| Nightingale        | 177 0 0  |
| Asby Bros.         | 172 0 0  |
| Sare & Co.         | 105 0 0  |
| Williams & Son     | 148 0 0  |
| Benson & Scholes   | 189 0 0  |
| G. Shaw (accepted) | 124 10 0 |

LONDON.—For fitting-up the basements of premises,  
No. 137, Cheapside, and No. 45, Gutter-lane, E.C., as a  
Restaurant for the London and Provincial Drapery Ex-  
change. Mr. Walter Graves, architect, Winchester-house,  
E.C.:

|                                                                   |          |
|-------------------------------------------------------------------|----------|
| J. Mansbridge, for bas-fittings                                   | £232 5 0 |
| Accepted.                                                         |          |
| Hailey & Co., for range, grill, and hot-<br>water work (accepted) | £130 0 6 |

LONDON.—For the erection of new beer store and  
part pulling down and re-building first portion of present  
beer stores at the "Stockwell" Brewery, Stockwell,  
S.W., for Mr. C. Hammerstein. Mr. Stanley Parker,  
architect. Quantities supplied:

|                                               | A.   | B.   | Total. |
|-----------------------------------------------|------|------|--------|
| Marwell Bros                                  | £390 | £278 | £1,568 |
| Prestige & Co.                                | 885  | 607  | 1,492  |
| Bishop (accepted)                             | 785  | 575  | 1,360  |
| A. New store.                                 |      |      |        |
| B. First Contract for re-building old stores. |      |      |        |

LONDON.—For sundry painting and repairs at the  
Hammersmith Wesleyan Chapel. Mr. Chas. Bell, archi-  
tect, 3, Salter's Hall-court, Cannon-street, E.C.:

|                           |          |
|---------------------------|----------|
| Reid                      | £584 0 0 |
| Carter                    | 460 0 0  |
| Adams                     | 377 0 0  |
| Thos. Wootton Smith & Son | 390 0 0  |
| Heston                    | 280 0 0  |

LONDON.—For alterations, &c., at the "Brighton"  
public-house, High-street, Camden Town. Mr. G. J.  
Thorpe, architect:

|                 |          |
|-----------------|----------|
| Anley           | £968 0 0 |
| Vollen          | 975 0 0  |
| Toms            | 827 0 0  |
| Mower & Son     | 898 0 0  |
| Gould and Brand | 894 0 0  |

LONDON.—For rebuilding existing dairy and stables  
at No. 1 Bulstrode-mews, Marylebone-lane, W., for Mr.  
Wm. Edwards. Mr. W. Campbell Jones, architect, 32,  
Bedford-row, W.C.:

|                    |            |
|--------------------|------------|
| Bush               | £1,260 0 0 |
| Holloway Bros.     | 1,217 0 0  |
| Williams           | 1,139 0 0  |
| J. Smith & Sons    | 1,067 0 0  |
| R. & E. Evans      | 1,059 0 0  |
| Woodman (accepted) | 1,040 0 0  |

LONDON.—For alterations and new shop-fronts to 475,  
477, and 479, Hackney-road, for Mr. H. W. Lee. Mr. G.  
Chuter, architect:

|                 |           |
|-----------------|-----------|
| Dixon & Jones   | £467 10 0 |
| G. W. Beale     | 330 0 0   |
| Thomerson & Son | 277 0 0   |

PENGE.—For the erection of cottages at Penge. Mr.  
G. Hubbard, architect. Quantities supplied:

|                      | Twenty-five | Twenty-one |
|----------------------|-------------|------------|
|                      | Cottages.   | only.      |
| Holliday & Greenwood | £5,971      | £5,071     |
| J. T. Chappell       | 5,739       | 4,924      |
| Smith & Sons         | 5,820       | 4,923      |
| Duncan               | 5,374       | 4,534      |
| J. O. Richardson     | 5,110       | 4,307      |

SOUTHAMPTON.—For additions to Manchester  
House, for Messrs Edwin Jones & Co., Limited. Mr.  
William Burrough Hill, F.S.I., architect, Southampton:—  
Messrs. Joseph Bull, Son, & Co.,  
Limited, Southampton, accepted. £13,245 0 0

UPTON, E.—For erecting two houses at Upton-park, for  
Mr. Fenning. Mr. J. F. Wesley, architect, 276, Rom-  
ford-road, Forest Gate:

|         |          |
|---------|----------|
| Garwood | £782 0 0 |
| Baxter  | 767 0 0  |
| Benny   | 715 0 0  |
| Wyles   | 680 0 0  |
| Worley  | 648 0 0  |
| Parsons | 585 10 0 |

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MENTS or ORDERS TO DISCONTINUE same  
must reach the Office before TEN o'clock on WEDNES-  
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READING CASES, NINEPENCE EACH.  
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Deal Dadoes, from 1s. 2d. per ft. super.  
Oak Dadoes " 1s. 8d. "  
Walnut Dadoes " 1s. 11d. "  
Oak, 1 inch Parquet Floors, laid and polished, from  
27. 10s. a square.  
Solid 1-inch Oak, straight boards, laid and polished, at  
28. 18s. a square.  
Solid 1-inch Oak Parquet for covering Deal floors, laid  
and polished, from 25 a square.  
Oak Wood Tapestry Dadoes, from 1s. per foot super.  
Walnut or Mahogany, from 1s. 3d. per foot super.  
Ditto with Heavy Mouldings, 4d. ft. extra.  
Ditto, ditto, with Carved or Painted Panels, prices  
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Prices given for all Interior Work, Doors, Architraves,  
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HOWARD & SONS  
Tender for Contracts for any Joiners' work, or Ornamental  
Plaster, Painting, Plain or Decorative, Wrought-Iron  
Work, Stained Cathedral Glass, and any other Interior  
Work.

#### TO CORRESPONDENTS.

W. D. W.—It cannot say till we have consulted lithographer.  
—O. A. E.—We cannot think that copying from lithographs of  
foliage, &c., is the way to learn wood-carving.—C. E. D.—W. D.  
should have attention.—M. T. W. (thanks; very satisfactory).  
H. S. (letter should have been sent earlier; must be deferred to next  
week now).—J. & M. C. (we cannot print letters of that kind; they  
are really advertisements).—W. & G. (Ditto. The paragraph is  
nothing but an advertisement of the firm concerned, made out by  
themselves).—W. G. (one list omitted as being too small).—Y. J. G.  
(below our mark).—W. H. H. (Rotherham (6, Westminster-chambers,  
London, S.W.).—A. A. (too late).—F. C. (too late).  
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# The Builder.

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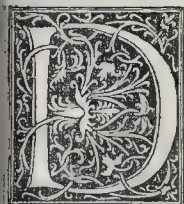
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### The Effects of Earthquakes on Buildings.



**DESTRUCTIVE** earthquakes seldom happen in this country that architects have not hitherto considered it a duty to specially study the construction of buildings with a view to minimise

the effects of earthquake shocks. Architects nowadays, however, are frequently called upon to choose sites and to design and superintend the erection of buildings in various parts of the world, including earthquake countries; so that a few remarks concerning the phenomena and their effects may not be altogether valueless. It is a very large subject, and one full of interest, but we cannot do more at present than give a brief outline of the known facts, pointing out defects and the remedial measures which may be adopted.

Let us commence by explaining what an earthquake is from a scientific point of view. An earthquake is any natural subterranean concussion the effects of which are visibly manifested at or near the earth's surface by movements of different kinds. Certain earth movements are sometimes called earthquakes, which would not, strictly speaking, fall within this definition; and it is desirable to indicate these, inasmuch as they are of a different nature, and consequently have widely divergent effects on buildings. The movements lastly referred to are chiefly the result of subsidence of large tracts of the earth's crust, owing apparently to the falling-in of gigantic subterranean caverns, which caverns have been hewn out of the rock by natural causes, such as the action of running water, sometimes heated and containing acids; or the abstraction of soluble mineral matter by the same powerful agent. Examples of this class of movement on a small scale are furnished by the subsidence of land in Cheshire and other places, owing to the abstraction of salt by both natural and artificial means, and by coal-mining. Such movements generally originate at a very short depth from the surface of the ground, and are not widespread in their effects; whilst the movements communicated to buildings situated within the disturbed area are of a totally different nature to those in a district caused by an earthquake, properly so called. The same remarks apply

to any movements of the ground due to landslips,—the slipping or displacement of enormous tracts of clay or rock.

The exact causes of a real earthquake are at present unknown; many hypotheses have been put forward to explain the phenomena, but it does not fall within our province to refer to these. Suffice it to say that, so far as the effects enable us to judge, enormous concussions or explosions take place at a comparatively shallow depth,—a few miles only,—within the earth's crust, producing wave-like undulations, which are transmitted by the rocks around to the surface of the ground. It seems quite clear that there is a definite place of origin in each earthquake, and this is called the seismic centre, and there is no doubt that the undulations referred to, are concentrically disposed with reference to this central point. They may, in fact, be likened to the waves produced in still water agitated by a stone thrown into it. From this it will be seen that buildings situated immediately over the seismic centre are not liable to be injured so much as those at a short distance, for in the one case the movement is more or less vertical, and in the other it is approximately horizontal. Buildings are not usually, of course, constructed to withstand horizontal, or but slightly inclined, stresses of the nature produced by this movement, and herein consists the essence of our enquiry.

As a general rule, earthquakes commence as slight undulatory movements, which become more and more intensified until the great shock (or shocks) occurs, and then they gradually die away. The movements throughout, however, are exceedingly rapid, as will be seen further on. The ground is suddenly shaken several times under the buildings, the higher portions of which are thus made to vibrate the most, and have the greatest tendency to become prostrated. The natural outcome of this is, firstly, that buildings in countries often visited by earthquakes should not be tall; and secondly, that no heavy materials should be placed on the roofs, or in the higher portions of the structures.

Further, if, on visiting a district recently devastated by an earthquake, we carefully examined the directions of the cracks in the buildings, and the positions of the masses of fallen portions of structures, we should soon recognise some law governing the fractures and dislocations. Cracks would be prevalent in certain directions; angular portions of buildings in certain situations would be broken

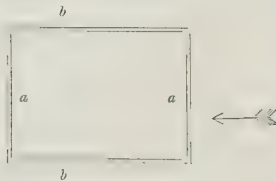
off, and much of the *débris* precipitated in similar directions; whilst walls placed in other positions would be untouched. All this tends to show that the motion produced by the earthquake was definite in direction. It is clear, therefore, that the destruction produced by earthquakes is not so irregular as at first sight might seem to be the case. But information of this kind, gleaned from observation on a single earthquake, is valueless from a practical point of view. When, however, we find that successive strong earthquakes in the same district, almost without exception, produce similar results on buildings similarly situated, we are led to conclude that there is a prevalent direction in the larger number of disturbances occurring in that district; and, knowing this direction, we can construct the buildings to resist the stress which will be produced by them. Mallet long ago recognised this fact, and his work on the Neapolitan earthquake of 1857 goes into the matter with considerable detail. The earlier seismologists, however, had not the advantage of the delicate instruments possessed by accurate observers nowadays, and the results arrived at by them, have necessarily undergone certain modifications.

It has remained for Professor John Milne, of Tokio, and his able colleagues and Japanese assistants, the members of the now celebrated Seismological Society of Japan, to work out the details of earthquake movement and its effects, and, what is more to our present point, to discuss the nature of the strains caused, and the construction of buildings intended to be earthquake-proof. In Japan at least two earthquakes happen every day, and observers in that country are, therefore, most favourably situated for studying the subject. Referring to the cracks produced in buildings by an ordinary earthquake, Professor Milne says\* that when a building is subjected to a slight movement, the walls at right angles to the direction of the shock are rarely fractured, and this is assumed to result from the circumstance that walls in this position move backwards and forwards as a whole. The walls which are parallel to the direction of the movement are those which generally give way. Seeing that the motion is progressive and wave-like, this result might reasonably be expected, for walls in the latter position unquestionably are extended and contracted along their length, portions of the same wall being subjected to different

\* "Earthquakes" (Internat. Scientific Ser.), 1886, p. 98.



phases of the wave during its passage, as indicated in the diagram:



The arrow indicates the direction of the movement. *a*, Walls at right angles to it, rarely fractured. *b*, Walls parallel to it, most liable to be fractured.

Professor Milne also gives an instance of what came under his observation on examining a number of houses of similar design and construction after the destructive shock in Tokio in 1879. These houses were in two stories, built of brick, and in many cases faced with a thin coat of white plaster. At the first-floor level there was a balcony, fronted by a low balustrade, supported by beams resting on columns, the roofs being made of thick tiles. The arches of the windows in the upper story were segmental, with heavy key-stones. The lower openings had a span of 9 ft., crowned with elliptical arches. In the 330 houses examined it was found that in the upper windows nearly all the cracks ran from the angle of arch and jamb at the springing-line. In the lower arches not a single crack was observed at the springing. "The cracks in these arches were near the crown, where beams projected to carry the balcony." The houses mostly cracked "were in the streets running parallel to the direction in which the greater number and most powerful set of shocks cross the city." From what we have said it will be seen that this result could be predicted; whilst we see the importance of constructing arches struck from a centre at the level of the springing-line,—*e.g.*, semi-circular or elliptical.

There can be no question that large windows and openings are great weaknesses; yet if they are specially constructed, they can be so arranged with reference to each other as to make them strong enough to resist a series of moderate horizontal pulls. A "flat arch" appears to offer more resistance to horizontal pulls than a true arch, though this must really depend almost entirely on the cohesive strength of the mortar or cement. A wooden lintel or iron girder would, of course, offer still better resistance to such a strain. It may be observed, as a general rule, that the last house in a row suffers the most.

As a matter of experience, Mallet points out that if an earthquake shock strikes a building diagonally, the general effect is to throw off almost the whole of the opposite vertical angle of the building in a triangular form, the base of the triangle being situated in the upper portion of the edifice, where the vibration is naturally greater, and the destruction more complete, than at the ground-line. As an example of this he instances the cathedral at Paterno, near Rome, which was thus affected by the Neapolitan earthquake of 1857.

After detailing a number of experiments on the walls of the Engineering College, Tokio, to determine whether the walls of an edifice which have once been cracked still continue to give way under similar shocks to those which produced them, Prof. Milne leads one to perceive that the presence of cracks in a building is a kind of preventive against its future destruction, in the event of a moderate earthquake; and he even speculates as to the desirability of designing buildings with joints and fissures in proper directions with a view to minimise the effects of shocks!

From the fact that the materials composing a building are of so many different kinds, they vibrate at different rates, the result being that where extremes meet, the destruction is most complete. Take, for example, a structure composed mainly of wood, with a brick chim-

ney: a shock is communicated to the foundations, and the movement is much more rapidly taken up by the light wooden framework than the heavy brick chimney, which has a slower period of vibration. The effect is, that the chimney is cut off short at the roof. Such is the suddenness of a shock, that a buttress may not have time to transmit its stability to a wall, owing to these two portions of the edifice not vibrating simultaneously. Phenomena of this kind have been observed in nearly all earthquakes, and clearly demonstrate the advisability of making earthquake-proof buildings as compact as possible, and with materials having the same approximate and relative periods of vibration. The selection of suitable materials should, therefore, be a primary consideration.

Long experience has taught the Japanese and the natives of other earthquake-stricken countries the nature of the buildings required for their habitation. Up to within the last few years Japanese houses were mostly of the lightest construction, and were so elastic as to be seldom injured. But they have a greater enemy to fear than the direct effect of the earthquake itself,—namely, the fires which so frequently ensue, due to the shaking over of the stoves or pots on to the highly inflammable wooden structures, and from other causes. For centuries past the Japanese chronicles recording earthquakes show that it is the fires which are dreaded, and not so much the earthquake itself,—a fact more clearly appreciated when we read that in Tokio alone it is not uncommon to see, in the winter, 100 to 500 houses swept away at one time from this cause, and Professor Milne states that in one winter he saw three fires which altogether destroyed upwards of 30,000 houses. These circumstances are rarely taken into account, but they serve to show us why so many Japanese are having houses built on the European model. One great factor in construction now is strength, not elasticity alone; and, provided the buildings are properly designed, suitable materials used, and their positions studied with reference to the prevalent direction of earth movements in the district, the edifices should be able to withstand almost any kind of shock without being materially damaged. The proof of this is that the buildings in Tokio, strongly put together, which have been especially designed to resist earthquakes, have suffered either not at all or but very little, whilst those made after the usual European model have mostly come to grief.

There can be no question, however, that where funds are plentiful, and a building on a large scale is to be erected, the Japanese can build structures on their own plan which are eminently suited to withstand these earth-movements. None of the ancient temples appear to have suffered even at the worst periods. They are mostly built of innumerable pieces of timber, intricately fitted together, but leaving the whole building elastic. To retard the transmission of the momentum from the ground to their houses, they sometimes place these latter on round stones or rollers. The inhabitants of Guayaquil build their houses and churches of bamboo, tied together with cords, with the same object. Referring to the city of Caracas, we find that many edifices have projecting basements with battering walls, which are better suited to withstand shocks than walls entirely perpendicular. Corner stones and roof-beams are frequently mortised. Mr. Warner states\* that "In many streets broad iron girders riveted to the wall about a foot above the house door, run from house to house along the front of an entire square. Turret-like brick chimneys, with iron top ornaments, would expose the architect to the vengeance of an excited mob. The roofs are flat or flat-terraced; the chimney-flues terminate near the eaves in a perforated lid."

Earthquakes, although extending over large tracts of country, are very local in effect. Houses only a few hundred yards away from each other, apart from their methods of design and construction, are frequently

\* H. D. Warner, "The City of Earthquakes," *Atlantic Monthly*, March, 1873.

affected in widely different manners,—*e.g.*, the inhabitants in one may experience but a slight shock, whilst those tenanted the other may feel the same shock much more intensified. The general direction of the movement is identical in both instances, but the geological structure and the contour of the ground may most profoundly modify the effects of the shock. It is a well-known fact that no matter how much a country as a whole, may suffer from earthquakes, there are certain spots within it which can be more or less definitely ascertained to be quite free from these disastrous phenomena, and, as our knowledge concerning seismology increases, maps of earthquake countries will be constructed, showing the comparative frequency and intensity of these earth-movements at all places. Indeed, this could be done in a rough way at the present time for certain parts of Japan; and in many other countries secure places can be pointed out. But perhaps the most practical method of dealing with this part of the subject at the present time is to discuss a few points concerning sites, which can with certainty be predicted as being specially dangerous in almost any affected locality. To assist in explaining these we will now give some further particulars of the action of earthquakes from a geological point of view.

The velocity of the earth-wave varies throughout different parts of its course, according to the nature of the materials through which it passes. Mr. Mallet has calculated that the shock produced by an explosion of gunpowder, in an experiment carried out at Holyhead, travelled at the rate per second of 951 ft. in wet sand, 1,383 ft. in friable granite, and 1,640 ft. in solid granite. In the Calabria earthquake of 1857 he found that the shock varied from 658 ft. to 989 ft. per second in different parts of its course. That of Lisbon in 1761 varied from 2,576 ft. to 4,122 ft. per second, and the great Tokio, in 1881, gave a result, recorded by accurate seismographs, of 4,300 ft. per second. When an earthquake wave passes from one formation into another made of different materials and having a different degree of elasticity, a portion of the motion is arrested, and is reflected to the surface bounding the two formations, the remainder, of course, being refracted. The shock along such boundary lines is, therefore, much greater than would otherwise be the case. From this we see the advisability of not erecting buildings too near the line of junction between a hard rock and a soft one,—such as a bed of sand or clay of medium thickness. The Suffolk and Essex earthquake of April 22, 1884, may be cited (from amongst many others) as a case in point.

A house in an earthquake country should never be built anywhere near the edge of a cliff or ravine. The shock is transmitted from particle to particle through the rocks, and the unsupported portion adjacent to the edge of the ravine is either thrown or split off, or is much more violently shaken than is the case in situations where the site is, as it were, buttressed on either side by plenty of solid ground.

Even so slight a shock as the English earthquake of 1864, before alluded to, the truth of this law was most painfully enunciated, as is pointed out by Professor Meldola. On the other hand, the presence of comparatively small cuttings, and especially where they are very numerous, is a protection against these earth-movements, for they break the blows, so to speak. The occurrence of large catacombs, many wells, &c., have had a great deal to do in preserving certain Roman cities. If in the grounds of a mansion a tolerably large, deep, and long sheet of ornamental water were made on the side of the building facing the quarter whence the prevalent earth-movements come, it would materially assist in preserving the edifice from destruction.

And now as to the kind of ground to build on. We have seen that the elastic wave passes more rapidly through solid rock than it does through less coherent materials. The



question is whether it is preferable to build on solid rock or not? One would imagine at first sight that it would not be desirable to build on a material which propagates motion so rapidly and with such force as solid rock; yet experience has, with one or two isolated exceptions, proved the contrary. Thus, in the great Lisbon earthquake, the buildings on clay were all destroyed, those on the slopes of the Almada sands and limestones suffered severely; whilst, on the contrary, all the buildings on the Hippurite limestone, and the basaltic rocks escaped entirely, the line at which the force of the earthquake ceased to be destructive corresponding exactly with the boundary of the softer and less coherent Tertiary beds. The same kind of thing happened in Jamaica, Messina, Calabria, San Francisco, Talcahuano, &c. We must be very careful in drawing conclusions from these facts, however, for there can be little doubt that where the less coherent beds are of great thickness the elastic waves and vibrations become absorbed to a large extent by the friction amongst the particles, and the movement is almost entirely arrested before reaching the surface. In a sand or clay district the effect of a shock depends a great deal on the depth at which the solid rock is found beneath the surface; loose materials, such as gravel and coarse sand, resting on hard strata, should always be avoided if possible.

## NOTES.

**T**HE news imparted by Lord Salisbury at the Royal Academy dinner, that an unknown benefactor had undertaken to erect a building for the National Portrait Collection at his own cost, if a site were provided, is certainly a most gratifying one, and such as might well draw forth "loud and prolonged cheers," and we may readily believe with Lord Salisbury that the name of this generous and modest donor will not long remain unknown. Still the satisfaction one feels at the prospect of at last seeing something done for our National Portrait Gallery is not unminged with regret that, in a country like this, such a work should be left to private means, owing to the fact that our Government actually, we believe, *dare* not spend public money for such a purpose; such is the national indifference to art of the public of whom Ministers and members of Parliament are the representatives.

**T**HE Theatres (County of London) Bill brought forward on Wednesday by Mr. Dixon-Hartland, and withdrawn, was no doubt totally illogical in its proposal to make the Home Office responsible for the safe condition of the London theatres, the Home Office being a State and not a municipal institution; and it is difficult to understand how any experienced member of Parliament could have made the mistake of suggesting that a State department should be asked to act as a local municipal authority. We quite concur, however, in much that was said as to the importance of a more rigorous and complete system of reform and supervision over London theatres in regard to safety of construction and arrangements for ingress and egress; and we hope the London County Council will take the matter in hand in a thorough and efficient manner, and appoint a sufficient number of officials, acting under authority, to keep a constant eye on the working of theatres in these respects. There is no doubt that there are some very unsafe theatres in London still, in spite of regulations which have worked some improvement. It was not quite fair for Mr. Webster, in urging the matter on the County Council, to refer to the officer of the Board of Works as having "neglected his duty" in regard to the supervision of theatres. There is no evidence whatever that Mr. Hebb neglected his duty as to enforcing the regulations of the Board; the evidence is the other way: he was only accused of making an improper use of his position to obtain orders for

theatres, and not seeing the impropriety of it. But every one who had to do with Mr. Hebb in regard to building regulations knew that he enforced all that it was his duty to enforce, in the strictest manner.

**T**HE case of King v. Dickeson, recently decided by Mr. Justice North, is one which has a practical bearing for those who are developing building estates. A number of lots were sold, and the purchaser of each lot entered into a restrictive covenant with the vendor not to build on his lot beyond a specified building line. The purchaser of one of these lots mortgaged a portion of it. The mortgagee had notice of the above covenant, but no express restriction was made by the mortgagor. The mortgagee foreclosed, and ultimately sold part of the lot to the defendant, who also had notice of the restrictive covenant, but again there was no express restriction on them. They built beyond the line, and the mortgagor thereupon had to enforce the covenant. But in this the court would not assist him. "There was no agreement," said Mr. Justice North, "between the plaintiff and his mortgagees as to the user of the land comprised in the mortgage, and though, no doubt, the mortgagees took the land subject to the obligations then existing in respect of it, and therefore subject to the right of the owners of the other lots to compel the observance of the restrictive covenant, there was nothing to prevent the defendant from building upon it in any way he pleased, provided that none of the owners of the other lots objected to his doing so." The moral, of course, is that the mortgagors should have a restrictive covenant inserted in the mortgage deed.

**A**N important question as to private rights over street architecture has been raised by Professor Baldwin Brown, who, in the columns of the *Scotsman*, has called attention to an unsightly addition which is in the course of being made to one of the dwelling-houses in Charlotte-square. Each section of this square is designed in a palatial manner as if it formed one instead of a number of residences, and it is a good example of its kind. Professor Baldwin Brown says:—"The northern block in Charlotte-square is, in a sense, as much a public possession as the Register House, though it happens to be made up of private dwellings. If the owners of these desire to exercise proprietary rights over their portions of the structure, and if their action involves, as in the present case, a serious damage to the general architectural effect, then civic authority should certainly interpose. The Dean of Guild Court is obviously the proper quarter to which to look, and is a body on which we ought to be able to rely to safeguard the interests of the citizens." Sir W. Fettes Douglas, P.R.S.A., has written equally strongly in the same sense. The right of a private individual to do what he likes with his own property has, for a long time, been a vexed question, but as the legislature have stepped in to prevent the pollution of rivers by proprietors on their banks, there seems no reason why proprietors who would spoil what may be called public architecture should not be also subject to control.

**T**HE new number of the *Antike Denkmäler* just issued by the German Archaeological Institute is full of subjects of interest. The plates, as usual, are impartially divided between architecture, sculpture, and the minor arts. The first plate is a restoration given by Drs. Kawerau and Dörpfeld of the temple of Roma and Augustus, to the discovery of the foundations of which we last year drew attention. It will be remembered that certain portions of the architrave bearing the dedication of the temple have been known since the days of Cyriac of Ancona, and the fact that this architrave is a segment of a circle, on plan, has greatly facilitated the restoration. Dr. Kawerau holds that both architrave and cornice are modelled after the pattern of the Erechtheum, and, on the strength

of this, attributes to the temple several Ionic capitals lying scattered about near at hand. The article on the Roma temple is appropriately followed by a short notice, with two accompanying plates, of the temple of Divus Julius and the arch of Augustus in the Roman Forum. The next two plates are devoted to archaic art. In the one are beautiful coloured *fac-similes* of the capitals of two votive columns found in the recent excavations. The other gives what will be of even greater general interest, a coloured reproduction of the remarkable "Head of a Triton," to which we have more than once called attention. The vivid dark blue and emerald green with which this extraordinary head is freely coloured are very startling, but if our memory serves us, perfectly faithful. Of the remaining plates we can only note that among their number is an excellent phototype of the new Praxiteles head of Eubouleus, and also a complete reproduction of all the Tegea fragments of Scopas. Last, but by no means least in interest, the department of vase-painting is represented by the publication of a vase from the Bologna Museum, on which is depicted the return of Hephaistos to Olympus. This vase is of special interest because of the presence of the seated Hera bound by invisible chains to her seat, a factor in the scene frequently omitted.

**T**HE current number of *L'Art* contains a great many sketches of works at the *Salon* exhibition, and facsimiles of studies of separate figures and groups for various pictures, reproduced from original sketches by various painters. Some of these latter are of great interest.

**W**E referred last week to the decision in the limited competition for a new library for the parish of St. Luke Chelsea, mentioning the award of the premiums. As the joint architect of one of the premiated designs is officially connected with this journal, we thought it better to decline any detailed criticism or comparison, which moreover, in regard to any practical effect it might have had on the choice of a design, must in any case, we presume, have been thrown away, as the decision was made and communicated to us before any criticism on the collection of designs could have been published in our columns. We desire to point out emphatically, as we have done in former cases, that to exhibit competition designs and invite public comment on them after the decision is made is a mere farce; and that if the promoters of competitions pretend to have any regard to public criticism on designs submitted in competition, they should invite such criticism *before* and not after they have settled everything. In the present case, without necessarily implying any dissent from the selection made, we may point out one or two defects in the design which we presume it to be carried out, which may be capable of being amended. (1.) We very much doubt whether the rooms which are shown lighted by rather small windows above the line of bookcases, i.e. about 8 ft. from the floor, will be found to be adequately lighted for reading: (2.) The magazine room, which is at present partially lighted by windows on the side where future extension is intended, will certainly be deficient in light in the centre whenever those lights should be removed: and (3.) the windows on the ground and first floors on the principal elevation are treated in an entirely different manner, the lower windows being divided up into small square panes while the upper ones have large sheets of glass unbroken by cross-bars. These two window treatments are entirely different in character and do not seem to belong to the same design.

**T**HE managing committee of the Clyde Trust definitely decided, at a recent meeting, on one of the various competing designs of ferry-boat for cross-river communication. An order for a pioneer vessel has been given to Messrs. Simons & Co., the designers, and the work has already begun



some time in hand at the Renfrew yard. This new traffic ferry-boat, the first of a series to be built for cross-Clyde communication, presents several novel features, both ends being exactly alike in form and in equipment of rudder and twin propellers. The vessel moves either way with equal facility; the necessity of "swinging" for a start is quite done away with; and it is claimed that a great command is obtained over all the varying movements essential to a craft of the sort working on the cross-section of a busy up-and-down navigation. The length is 70 ft., with a beam of 43 ft. The bottom, or floor, is very flat, and the level of the lower, or fixed deck,—if it may so be distinguished,—rises but little above the water-line. The upper or traffic deck is movable, rising from the rigid portion of the framework below in proportion to the gradual fall of the tide, and in like manner descending when the rise of the tide requires it, so as always to present a deck level with the quay. These motions are directed by a pair of engines which are distinct from the propelling machinery. They act by means of worm gearing on vertical screws of steel, fixed to perpendicular standards, which rise from the central portion of the hull, three on each side. These massive uprights are securely strapped the one to the other by ties of steel-work stretching fore and aft along the summits, and by powerful girder bars of the arc form bridging each pair transversely, the whole being stayed to port and starboard by equally strong downward continuations, which are bedded in the solid framework of the gunwale. The central portion, fore and aft, of this movable deck, between the uprights, is for hoisted traffic, the capacity being equal to eight carts with their cattle; while the narrower wings outside the uprights are for foot passengers, on a scale of 120 persons each crossing. This composite deck extends the entire length of the boat, the central or wheel portion occupying about one-third of the full beam, and communicating with the quay top along gangways hinged to the ends of the deck, these being raised and lowered by hand. Propelling power, acting by means of twin screws at each end (four propellers in all), is supplied by two pairs of compound surface condensing engines, placed, with their boilers, below the water-line, and thus contributing to a general rigidity which, of course, is apt to be impaired when towards low water the traffic platform gradually ascends to its loftiest position. One thing in favour, however, of a system of the kind in this particular application is the very moderate range of tide obtaining on the Clyde, which is only 9 ft. 9 in., as compared with 18 ft. on the Thames. The estimated cost of one vessel of the above type is 15,000*l*.

SOME correspondence has lately appeared in *The Times* with respect to the impending sale, for building purposes, of Wandsworth Manor House. The writers state that the house was built by Sir Christopher Wren, that Sir James Thornhill painted the staircase ceiling, and wall panels, and that the Princess Anne resided therein for several years after her marriage, until she ascended the throne. We may add that the grounds, covering about five or six acres, lie on East-hill, near to the slope which used to be known as French Horn-fields, after the tavern by that sign, and those of the Fishmongers' Almshouses, which were originally established at Newington Butts. Either wholly or partly within this parish,—watered by Pope's now no longer "blue transparent Vandalis," a stream once famed for trout, "for which I love to angle above any fish," quoth Izaak Walton,—were situated four manors, namely, Allfarthing (Garrott); Battersea and Wandsworth; Dunsfold, long held by Merton Priory; and Downe, or Dun-boys. The Wendesorde of the Domesday survey was at that date held by one William FitzAnulf, son to Anulf, shire-reeve of Surrey, who is credited with having obtained possession by dishonest means. William I. bestowed the Battersea and Wandsworth manor upon

the abbot and monks at Westminster. In 1291, under the valuation made for Pope Nicholas IV., the demesne was assessed as being worth 17*l*. After the dissolution, this manor passed to the Crown. Upon the death of Henry, Prince of Wales, his father settled it upon Prince Charles, who, in 1627, granted it to Oliver St. John, created (June 3, 1620) Viscount Grandison, of Limerick, and advanced to the English peerage on May 21, 1626, as Baron Tregoeze, of Highworth, Wiltshire. Dying in 1680, he bequeathed the manor to his nephew John, grandfather to Sir Henry St. John, elevated Baron St. John, of Battersea, and Viscount St. John on July 2, 1716, whose eldest son was Henry, the celebrated Lord Bolingbroke.\* Frederick, third Viscount St. John, obtained an enabling Act to sell the manor to John, first Earl Spencer, in whose descendant it, we believe, now vests. Close by the manor-house, at the junction of the roads from Vauxhall and Clapham, and over against a house called "The Huguenots," is Mount Nod, a small triangular grave-yard, wherein are buried some descendants of the Protestant refugees who settled in Wandsworth after the Revocation of the Edict of Nantes in 1685.

THE fine stone-built Elizabethan house known as Wakehurst Place, situated a short distance northwards from Ardingley (priori Earthingley) in Lewes Rape, Sussex, is about to be sold. This house, famed for its interior, was built in 1590 by Sir Edward Culpeper. The property had passed by marriage into his family from the Wakehursts, of whom Richard was made a knight banneret at the siege of Caerlaverock Castle, by Edward I. in 1300. Sir William Culpeper sold it, in 1694, to Dennis Lyddell. In 1776 it was bought by Admiral Peyton, and of late years has been occupied by the Marchioness (Dowager) of Downshire. In Ardingley parish church, of temp. Edward III., and restored by Sir G. G. Scott in 1853, are some old brasses to members of the Wakehurst and Culpeper families, including one to Nicholas Culpeper (1510) and his wife Elizabeth (1500). Wakehurst Place, having been for some years previously untenanted and neglected, was rehabilitated about fifty-five years ago. The estate is more than 1,090 acres in extent, under cultivation.

A NEW book of illustrations of wall-papers, recently sent us by Messrs. Jeffrey & Co., deserves special mention for the high artistic character of the designs included in it, most of them the work of well-known decorative artists. The designs are arranged so that they can be either all unfolded in a long series, or can be turned over book-wise, the cover being arranged to open either way, back or front, so as to include a double number of designs on the pages, which are printed on both sides. In this form it makes a very convenient book of reference for the designs contained. The collection includes a good many designs for ceiling-papers, which for the most part are rightly kept rather light and open in design; a heavy and much filled-up design on a ceiling tends to lower the apparent height of the room, and therefore should be avoided. Indeed, it is rather a question whether the use of ceiling-paper, though it gives richness and completeness to the decorative effect of an interior, has not always certain inevitable drawbacks, especially in reducing the light reflected from the ceiling. Among the ceiling-papers the "Wreath" and the "Daisy," both designed by Mr. Lewis F. Day, are very graceful in design and well-suited to their intended position; and a ceiling design evolved from shell forms by Mr. Walter Crane is very original and effective. Mr. Crane's "Dove" ceiling, with alternate light and dark panels, the darker ones containing a dove with outspread wings, and the lighter ones a small sprig of conventional foliage, strikes us as too heavy in effect for a ceiling-paper; and the same objection may be suggested to the "Bartolozzi ceiling" by Mr.

Brophy. Mr. A. Jonquet's Louis XVI. ceiling is good and light in design. The wall-papers, properly so called, include some splendid designs by Mr. Crane, Mr. Day and Mr. Sedding, and among the less sumptuous examples a "Flower Scroll" by Mr. Brophy is a very good example of conventional floral design, free and flowing in line, but filling up the surface completely, and producing a broad and rich decorative effect. The book includes also some fine designs for staircase-papers.

MR. TADEMA'S large picture, "A Dedication to Bacchus," now on view at Messrs. Lefevre's Gallery in King-street, St. James's, has been painted, we are given to understand, as a companion to the picture of "The Vintage Festival" painted a good many years ago. It is the same size (a larger size than the average of the artist's works), and of course in subject has a direct relation to that of the earlier painting. The scene of the dedication is laid on a marble platform adjoining a temple, a portion of the sculptured podium of which appears on the right. Over the balustrade is seen a dark sea—too dark in colour and (as we have said of another painter's sea in a classical subject in the Academy) not recognisable as sea except from its position in the composition and its horizon line. On the right is the altar of Bacchus with a small palanx of ministrants ranged on either side of it: opposite the spectator is a company of people coming forward; in the centre of the foremost rank is a little naked child, a girl of six years old or so, behind whom are her parents and her aged grandfather, and who, so we are informed in the prospectus (for the painting hardly conveys the information), is the person who is to be "dedicated to Bacchus." Such is the subject to which an artist of the highest technical ability considers it worth while to devote his powers. To those who think at all about the meaning of a picture we should imagine that this spectacle of a child in the naive and fresh innocence of infancy being dedicated to Bacchus—knowing pretty well what the worship of Bacchus in ancient Greece meant—was a melancholy, even a painful subject to make a picture of; it certainly is so to us. Apart from this consideration, the painting is one of Mr. Tadema's finest works. The figures have more variety of character and interest, as personalities, than in some of the artist's works, there is more human nature in them and less of mere drapery of models in antique costume; and the colour, brilliant in general effect, is perfectly harmonious as a whole, and entirely without crudeness or harshness in detail. A fine point in the picture is the slight—very slight indication of a reflected tone of the blue sky in the marble pavement, a thing which an inferior painter might have been tempted to exaggerate. All the architectural details are painted with Mr. Tadema's usual unequalled realism and force. It seems a pity that all this splendid workmanship should not have gone towards illustrating some noble subject—some action in human history worth illustrating and commemorating.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—II.

THE first-numbered drawing in the show we have already commented on, and will proceed to notice others in the order of hanging, omitting those which suggest nothing for comment.

1816 "Views in Hall, Brykyle, Barton-on-Trent." Mr. R. W. Edis, we presume owes its position on the line to the architect's name, and to the fact that it represents a respectable classical entrance hall; the character of the drawing, hard, scratchy, and mechanical, would probably have excluded it had it come from any one without a name, and its position on the line is a mystery. We should have passed it over altogether but for the occasion of commenting on the curious idiosyncrasies of hanging which are characteristic almost always of the Architectural Room.

1817 "Houses at Ascot and at East Hill, St. Lawrence-on-Sea." Messrs. Ernest George &

\* "Windsor Forest: The Compleat Angler," Chap. III.

\* Died at the family house, Battersea, and buried in St. Mary's parish church, 1751.



sto. Brown ink drawings slightly tinted, in the usual artistic style of execution in which the drawings which go by the name of this architectural partnership are got up, and in which the attempt to make new houses look like old ones is most successfully carried out. It may be questioned whether the effect of the actual buildings, in this respect at any rate, comes up to that of the drawing.

1818. "The New Library of the People's Palace": Mr. E. R. Robson. An interior of a large octagon room with a central skylight, designed as if constructed on the principle of intercepting vaults used in some of the Indian domes, but whether this is the real construction, or only an architectural *façon de parler* in plaster clothing, there is nothing to show. The visible ribs of the design are broad, flat, and annelled, with circular medallions and crossed mouldings interrupting the panel at intervals: a very mediocre manner of decoration. At the principal intersections of the ribs are circular medallions in relief, as bosses, from which long lamp-stalks depend. The lower compartments of the roof form semicircular vault arches without ribs or moulding of any kind, filled in with three-light windows with a large circular-headed compartment in the centre and a smaller square-headed light at each side; the centre light crowned with cornice, brackets, and curiously pediments of the approved *rococo* style. The walls below the roof-springing are occupied by book-cases, with a gallery of communication in the middle of their height. The book-cases are interrupted by plain square piers in each angle of the octagon, decorated just below the springing with a niche containing a bust of an eminent author: these busts are illustrated separately at the sides of the drawing; they are those of Chaucer, Johnson, Dryden and Scott at one side, Shakespeare, Milton, Byron and Wordsworth at the other. Spencer and Pope are far more claim, as there were only positions for eight, than Johnson and Dryden. The idea is a good one, but it is to be hoped that the actual busts as executed have more character and force than the drawings here convey; those of Byron and Milton, in particular, are exceedingly weak and characterless. In the main the room seems well adapted for its practical purpose, but one must regret that the people "should be presented with architecture which exhibits such merely commonplace elements of design and detail.

1819 "Rhinefield, Hants": Messrs Romaine-Walker and Tanner. A very picturesque, long, ragged Tudor-Gothic house, with a black lac which gives a kind of vague clue to the arrangement; it is obvious that the right-hand wing represents the living-room portion of the house, and the large octagon bay-window is probably the drawing-room; what seems to be a carriage entrance to a small courtyard is seen further to the left, with a square tower rising over it; and we presume that the block to the left of this, round a large quadrangle, and which shows only small windows high up in the wall, is the stable and coachhouse portion of the establishment, the architecture of which thus tells its own tale to a creditable extent. The sketchy indication of shrubbery in the foreground, by a mass of shading lines, is far too pughly done, considering what a prominent part of the foreground it is, and tends to spoil in otherwise good drawing.

1822. "The Wise and Foolish Virgins; design or decoration of a church": Mr. Joseph W. Forster. Hung too high to be well seen, but looks good in a decorative sense, though rather naive. The two companionships of virgins are represented extended frieze-wise on either side of a door which opens in the wall and shows the blue of heaven through: a pretty fancy.

1823. "Decoration; boudoir": Mr. John J. Shaw. We have seen other decorative work by Mr. Shaw which is good, and therefore presume his may be so; but it is hung too high to form any idea of it.

Mr. Holiday's fine design, No. 1825, we have already spoken of. 1826, "Flixton Hall, Suffolk, oval elevation," and 1833, west elevation of the same, by Mr. Fairfax R. Wade, are delicately-drawn pencil elevations, coloured to distinguish brick and stone, of an Elizabethan house which, from the plan which the author has commendably appended, appears to consist of some portions of an old house retained amid a large addition of addition or rebuilding. In the west elevation the side of a conservatory addition is shown with large Tudor-arched windows, and possibly with a glass roof concealed behind the

battlemented and pinnacled parapet; behind this is a central bay window through two stories, with a very elegant clock stage and lantern over it. The chimneys are of the usual Elizabethan type, with variously ornamented chimney-tops, the windows mostly square-headed, mullioned openings. A rich effect is produced by the double row of panelling under the battlements of the principal cornice. The whole is marked by unexceptionable taste and refinement in style and drawing.

1827 "Newnham College, Cambridge": Mr. Basil Champneys. Three pen drawings, the first showing sketches of Old Hall, 1873; and Sidgwick Hall, 1880; the two other views of Clough Hall, which we presume is the *raison d'être* of the drawing. The main front is a very quietly-treated building of Queen Anne type, thoroughly "Collegiate Domestic" in character; the only portion presenting any originality of treatment is the exterior of the dining hall, which may be said to be Gothic architecture carried out with Classic details; there are buttresses which break off into colonnettes above and finally terminate in inverted consoles, and between them round-headed windows under deeply-recessed arches which partly stop against the buttresses; towards each end of the hall is a large semicircular projecting bay, entirely glazed, and with a domical cupola, the front portion projecting slightly from the semicircle and finished with a pediment head. This dining hall is an exceedingly pretty bit of thoroughly Collegiate architecture.

1829. "Museum in the Public Park at Baroda": Mr. R. P. Chisholm. A pen-and-ink elevation of a building in Indian style, with a domed central octagon feature over a central hall, to which access is gained by an external flight of steps leading to the principal floor level; the museum buildings extend right and left on either side of the central hall, protected from the heat by being recessed behind colonnades in the ground story; the "columns" are simply square piers running flush into the architrave, the openings decorated below the architrave by a hanging pierced work filling up the upper portion. Above this is a low frieze and over that a row of small square windows with colonnettes between; over this comes the main cornice and balustrade, behind which the inner or main line of wall rises with larger windows. The colonnade and frieze, &c., are stopped at each end by angle towers terminating the composition. The design is an effective application of the elements of Hindoo architecture, picturesque in effect and expressing its purpose well.

1830. "Cloisters, Gloucester Cathedral": Mr. C. E. Mallows. We have already referred in passing to this as a good example of picturesque perspective sketching in pencil: it may be questioned however whether it is justifiable to leave out so much of the detail of the piers and leave them entirely light as against the wall seen at some distance behind them; it is pardonable perhaps in a sketch (which this is, rather than a drawing), but though it produces a bright and sparkling effect, it is not true.

#### LETTER FROM PARIS.

IN spite of pessimist prophecies, the Paris Exhibition has after all been opened on the date fixed a long time previously; the opening ceremony has come off very successfully, and the inauguration of this vast undertaking is certainly one of the most striking indications in recent years of the remarkable vitality of France. The success of the enterprise so far is mainly due to the energy of a few men; especially to M. Georges Berger, whose energy and talent as an administrator had already been proved when he filled the post of Commissaire Général des Sections Étrangères in the 1878 Exhibition; to M. Grison, the director of the financial element in the enterprise; and to M. Alphand, who has so long laboured for the artistic improvement of Paris.

The French Government has not forgotten to give its official recognition to those who have laboured in the cause. M. Alphand has been created "Grand Croix" of the Legion of Honour, M. Berger "Grand Officier," and M. Grison and M. Chas. Garnier "Commandeurs." Among the new promotions to the degree of "Officier" are M. Bouvard, the architect of the central dome and the "Palais des Industries Diverses"; M. Formigé, architect of the Palais des Beaux Arts and the Palais des Arts Libéraux; M. Dutert, architect of the Galerie des Machines; M.

Eiffel, whose title to honours will be questioned by artists, though not by the populace; and M. Lavastre, the decorative artist of the central dome. The lesser recognition of "Chevalier" has been accorded to M. Gratigny, inspecting architect under M. Bouvard; to M. Compagnon, the director of works on the Eiffel Tower, and to M. Déjans, who acted as resident engineer on the work.

The impression produced by the spectacle of the opening, of the immense extent of buildings and the vast crowd that congregated, was very striking, but withal somewhat confusing to the memory, for the whole affair was too large to allow of studying it in detail; we can only give a kind of general record of the impression of the ceremonial.

For the whole of the week preceding the opening, the whole district extending from the Pont de la Concorde to the Pont de Grenelle, including on the left bank of the Seine the Quays, the Esplanade des Invalides, the Champ de Mars, and on the right bank the Trocadéro and its gardens, were occupied by crowds of workers in a state of what may be called feverish hurry. Thousands of workmen, representing all kinds of racial types of humanity, were engaged in completing their installations, while M. Alphand's army of gardeners put the finishing touches to the plantations, and transformed into an immense *place*, adorned with plantations and flowers and statuary, what had but a day before appeared an almost hopeless confusion of *débris* without a place for the sole of the foot-passenger. By dint of prodigious efforts, when the cannon on the opening day announced the arrival of the Head of the State, the spectators had at least the optical illusion of a completed exhibition before them; an optical illusion only, be it understood, for there is a very great deal to be done yet; but on the occasion of the official visit the crowds of unopened cases were duly masked behind decorative hangings and other concealments, as well as by the crowd forming and following the *cortège* itself.

Apart from this prosaic fact of the state of things behind the scenes, which cannot be denied, the affair was a great success. The weather seemed to be as complimentary to a President of the Republic as it is said in other countries to be to Royalty; and a splendid sun was shining when, at 2 p.m. precisely, the President entered the space under the central dome where all the high functionaries of the State, and of the *personnel* of the Exhibition, were assembled to receive him, as well as numerous representatives of foreign Powers, whose varied and brilliant costumes added to the picturesque effect of the scene. There were two speeches only, that of M. Tirard, President of the Conseil des Ministres, and Commissaire-Général of the Exhibition, and the reply of M. Carnot, who was much applauded at several points in his speech, especially in his expressions of cordial welcome to the foreign visitors.

After these two speeches, and while the Colonne orchestra played, the *cortège*, marshalled by MM. Alphand, Berger, and Grison, entered the Galerie des Machines, which is the most complete portion of the Exhibition, and after traversing the aisle between the long ranks of machines of various types, the President entered the Salles des Industries Diverses, and proceeded thence to the Palais des Beaux-Arts. Here the procession came to a halt under the dome where the pictures forming the Centennial Exhibition are collected, and here the President was entertained at lunch by M. Meissonnier and M. Pronst, while the band and chorus, conducted by M. Dambé, gave several pieces of music, including, as specially appropriate to the occasion, the "Marche Républicaine" composed by the late Adolphe Adam. After this, a visit to other sections took place, and the procession traversed the length of the Palais des Arts Libéraux up to the Eiffel Tower, and came back to its starting-point before the central dome. There the President entered a carriage with MM. Tirard, Alphand, and Berger, to visit the sections of Agriculture and Alimentation, and arrived at last at the Esplanade des Invalides, the termination of this long promenade. Here he traversed with his escort the central alley, which was covered with a red and white awning, paused a few minutes at the Palace of the Ministère de la Guerre, and then visited the exhibitions representing Algeria, Cambodia, Annam, and Senegal, filled with various colonial troops in picturesque uniforms. It was with some difficulty that the procession could make its way through these courts, filled with a



motley crowd of natives of the various countries represented, of all shades of colour and in the most picturesque dresses of a brilliant poly-chromy, who crowded round the Presidential carriage with loud acclamations. It was now six o'clock, and M. Carnot quitted the Exhibition, which was then taken possession of by the army of sightseers, whose first move was to carry by assault the various dining-rooms and restaurants, where there was no little difficulty in keeping pace with the demands of this crowd of hungry visitors.

While we were "assisting" at this spectacle of a scramble for food, at which, for a good many of the spectators, curiosity served to keep off the recollection of hunger, the gardens were illuminated, and the central dome burst into many-coloured lights. Opposite to it the Palace of Trocadéro was illuminated with fairy-like effect. Above a maze of electric lights in the gardens and shrubberies, looking like fiery flowers, rose the enormous mass of the Eiffel Tower, blazing with Bengal lights and sending from the top its powerful electric light over the scene. No description could give an idea of this really incomparable piece of spectacle, which was further heightened by the play of the fountains with waters variously coloured by electric rays, red, yellow, blue, green, and violet.

Beyond the Champ de Mars, the Seine, covered with craft of all kinds, offered the spectacle of a Venetian fête, from the Pont de Grenelle to the Ile St. Louis. Numerous illuminated vessels circulated between the two lines of lights on the banks, amid the sounds of military bands, and the whole scene, with the bridges also all decorated with garlands and lights, formed a wonderful framework to the further illuminations of the Panthéon, the Louvre, Notre Dame, the Institut, the Hôtel de Ville, and other public buildings, which were all lined and profiled with lights.

Such is a brief *résumé* of this festive day of May 6; a splendid picture which those who saw it were unwilling to quit. When we had returned to the centre of the city, where popular rejoicing was also in full swing, the sky to the south looked as if reddened by a conflagration, with the electric light on the Eiffel Tower shining like a great beacon above.

Having given this brief account of an opening fête so far superior to that of the 1878 Exhibition, let us add some scraps of practical information in regard to the Exhibition. First as to the important subject of entrance arrangements. In this Exhibition there is a complete absence of turnstiles, and the public can enter freely during the day on presenting at the gate a one-franc ticket, which is purchased in advance. In the evening the price of entry is doubled. The entrances themselves are disposed in the following manner:—The Seventh Arrondissement, that is all the portion adjoining the Esplanade des Invalides and the portion east of the Champ de Mars (Faubourg St. Germain) has thirteen main entrances and nineteen wicket-gates (*guichets*). In the Fifteenth Arrondissement, west and south of the Champ de Mars (Côté de Gréville) there are four entrances and eight wickets. In the Sixteenth Arrondissement, next the Trocadéro, there are five entrances and ten wickets.

As to the amount estimated from entrance payments: for that portion represented by the coupons or vouchers of subscribers to the Exhibition through the Crédit Foncier, it is estimated that there should be 30 millions of visits, representing an equal number of detached subscribers' coupons. Adding to these some millions of visitors with the tickets purchased at the different repositories, the total takings must certainly very much surpass those of any former exhibitions, where the number of entries did not rise above 12 or 14 millions.

As to the Eiffel Tower, the monstrous centre-piece of this gigantic show—the architectural aspect of which it would be unkind to criticise any more now that it is done (and perhaps M. Eiffel's illusions are dispelled by this time), the tariff is fixed at two francs for the first platform, three francs for the second, and five francs for the summit. Contrary to ordinary custom here, these prices are to be lowered on Sundays, when it will be one franc to the first platform, 1-50 to the second, and two francs to the summit. The tower is estimated to be capable of finding room for 6,000 visitors at once on its first platform, 1,500 on the second, 500 on the summit, and counting in those who may be on the way up or down, and those in the service of the Restaurants, there may be about 10,000 persons

at once accommodated in this gigantic iron toy which towers over all Paris, crushing the life out of all the architectural monuments below it, and producing on us residents, who cannot avoid seeing it always and from all quarters, the effect of a nightmare.

On the eve of the opening of the Exhibition was held the ceremony organised at Versailles in memory of the meeting of the États-Généraux in 1789. We cannot undertake to give any special account of the ceremonial. It was inaugurated by fixing a tablet, commemorating this historic event, on the façade of the "Hôtel des Menus Plaisirs," now become merely a barrack. Then followed a visit to the Palace and an inauguration of the "Bassin de Neptune," now completely restored; a piece of work which was begun nearly ten years ago, and has cost 500,000 francs. Thanks to the new architect in charge, M. Marcel Lambert, the complete repair of Versailles is now actively proceeding. The façade of the Pavillon Dufour, facing the Pavillon Gabriel, has been rebuilt, and also the Cour de Marbres is nearly complete in its restoration and repair. But as a certain number of celebrated pictures have been temporarily removed to be placed in the "Exposition Retrospective," notably the "Coronation of Napoléon I." and the "Battle of Taillebourg," by Delacroix, there are melancholy gaps on the walls of the splendid saloons, ill-concealed by hangings of green cloth.

The opening of the Exhibition will have, among other good results, that of pushing on the electric lighting of Paris. The installations now nearly complete include six segments of a circle, extending from the centre to the circumference of Paris, and corresponding to an equal number of companies who have obtained concessions. The most advanced is the Edison Company, whose machinery is established in the basement of the Cour du Palais Royal.

Amid the excitement about the Exhibition, the opening of the *Salon*, on the 1st, attracted less than usual notice. There was, however, the usual crowd on the "Jour de Vernissage," and numerous visitors during the first days of opening, especially on the Sunday. Of the architectural exhibits the *Builder* has already given some account, and of the paintings and sculpture we shall have something to say in a special article hereafter.

The Musée de la Révolution, organised in the Salle des États, has proved but a meagre attraction. In spite of the presence of the sword of the "Grand Carnot" (grandfather of the present President), and of a certain number of curious drawings and autographs, the collection is chiefly interesting to antiquarian students, and the crowd prefer to take their money to the Champ de Mars, rather than to this necropolis of the Revolution. Not far from here, in the Gardens of the Tuileries, there will open almost immediately the *Salon* by M. Gervex and Alfred Stevens, who, aided by a number of younger artists, have represented all the celebrities of France from 1789 to the present day. The scene is laid in an architectural *ensemble* very well designed, and through the porticoes and colonnades which surround the spectator are seen the Avenue des Champs Elysées, the Place de la Concorde, and the Tuileries. There is a marvellous collection of portraits arranged with great attention to general composition and to correctness of costume, and it will probably be a great success with the public. We cannot promise as much for the "Tout Paris" of M. Castellan, installed near the Colonial Exhibition on the Esplanade des Invalides. Here the point of view chosen is the Place de l'Opéra, with the avenues converging on it. Most of the celebrities painted by the artists are rather doubtful likenesses; the personages are treated rather in caricature, and have no appearance of reality, the *sine qua non* in a panorama. The artist had placed General Boulanger in the front rank of his portraits, but at the instance of official remonstrances of a rather threatening character the General has been suppressed, and his place taken by the Shah of Persia!

We have no space to say anything special as to the exhibition of the pastelists in the Galerie Georges Petit, arranged under the direction of M. Roger Ballu (besides that a very complete collection of the works of the same artist is to be found in a little pavilion in the Exhibition), nor of the "Cercle de l'Union Artistique," which is splendidly housed this year in the old Cercle Impérial in the Champs Elysées, except to mention a fine portrait by M. Elie Delaunay, who has been elected chief Professor at the École

National des Beaux Arts, in the place of Cabanel.

M. Pascal, we may also mention, has been appointed Inspecteur-Général des Bâtimens Civils, in place of the late M. Questel. M. Juste Lisch, the architect of the Gare St. Lazare, has just received from the President the cross of officer of the Legion of Honour, a recognition well merited by the ability and energy he has shown in carrying out this immense piece of work, with the terminal hotel attached to it.

From the first competition for the Prix de Rome in painting the following have been elected to take part in the final competition: MM. Lavalley, Thys, Gervais, Abel Royé, Ernest Laurent, Chas. Lenoir, Derambet, Gorguett, Danguy, and Castaigne. The twelve competitors for the similar prize in sculpture have commenced their labours on a bas-relief of a given subject, on which the decision will be given at the end of July.

We have to record the death of M. Jobbé Duval, the painter, at the age of 68. Felix Jobbé Duval, who had recently quitted the Municipal Council of Paris,—in which he had sat since 1871, to direct the School of Design in the Rue Ste Elisabeth, was born at Carhaix (Finistère) and studied successively under Delarocche and Gleyre. He devoted himself to historical painting, especially of religious subjects, and many of the churches of Paris contain works by him commissioned by the State or the Municipality during the Second Empire. This class of subjects has fallen into much disrepute in France in these latter days, and the painter himself changed with the times, and became one of the most ardent Republicans and "libre-penseurs" of the day, and was interred without any of the ceremonies and prayers of the Church for which he had chiefly worked during the greater portion of his artistic career.

#### PICTURES AT THE ROYAL ACADEMY.

WHILE concurring with the opinion expressed by Sir F. Leighton at the Academy Dinner, that this year's exhibition is remarkable for the variety of style and aim represented in it, we do not think it will be generally considered to be a very strong Academy exhibition. There seems more than the usual proportion of pictures which, from the intellectual standpoint must be pronounced entirely uninteresting, however respectable in execution; and others which are interesting in intention are not successful in execution.

Mr. Orchardson's large painting, "The Young Duke" (243), has perhaps the best claim to be considered the central work of the year: it represents a large *salon*, rich in architecture and decoration, in a Louis XIV. palace, where a crowd of figures standing round three long dining tables are toasting their youthful hosts who sits at the centre table with an air of insolent patronage happily expressed on his countenance. The objects furnishing the table are painted with the greatest care and finish, and the whole is a fine example of that peculiar but rich harmony of colour, rather unreal, which Mr. Orchardson has invented for himself, and which seems to remain his own secret. Unless as a satire on selfish luxury (which is perhaps the intention), the picture is deficient in that moral point and significance which have distinguished Mr. Orchardson's paintings in previous years; it tells no story even, and there is a sense of inadequate motive as compared with the brilliant talent displayed in the work. Opposite this is the President's largest, but not his most successful work, "Greek Girls Playing at Ball" (300), a terrace on which are two figures, a young woman in purple drapery in the foreground, who has thrown a ball, and stands in a rather oddly-contorted attitude looking after it, and a younger companion in light saffron drapery who stretches up on one foot to catch it with a lightness and spring of action which are admirably expressed. The colour effect of the picture is most harmonious, but there is no realism of texture in any part of the painting; it is purely decorative, even to the dark sea in the distance, which is only recognisable as sea from its position in the scene. Realism, however, was no object in the painting; Sir Frederic Leighton's most impressive work is certainly "Invocation" (31), a three-quarter figure of an exquisitely beautiful young woman with her bare arms raised above her head towards a statue on a white fluted column just seen in the foreground; the figure is heavily



aped in white,—the semi-transparent drapery held behind her head, with the light shining rough, giving the effect of a kind of aureole, dark purplish curtain hangs as a background, over which the entablature of a Doric temple is seen in perspective. As a pure vision of abstract beauty this work is a great success. The painter's other contributions are "Sybil" (25), a seated figure, a fine foil in colour and conception to the last-named, but by no means of equal interest, and a head entitled "Elegy" (37).

Mr. Seymour Lucas has done well in his painting of "The Surrender" (67) of a Spanish ship of the Armada to Drake, on board Drake's ship; there is an air of reality about the scene, and the contrast between the aristocratic figure of the Spaniard in armour, delivering his sword with a stately courtesy, and the square-limbed figure of Drake in knee-breeches and buckskins, with his back to the spectator, turning the Spaniard's bow in a stiff and unmannerly manner, is very characteristic. The subsidiary figures of the Spanish retinue are the best, the English retinue being rather void of special character and expression. By coincidence (or by arrangement?) Mr. Vicat has given us the prelude to the same scene, in his large sea-piece called "The Immortal Surrender" (343), where we have Drake's ship in the foreground and the Spanish fleet in the middle distance, with a great deal of wind and movement in the picture, and in which the foreground waves seem to be forced up into a "short sea" by the rebound from the hulls of the ships about, otherwise the sea and movement of the water is hardly pointed for. The sea, at all events, is not the best part of the picture, which as a whole is an impressive one, and to our thinking superior to the artist's "Pool of London" last year.

Mr. Alma Tadema's picture, in its usual place in Gallery III., is, like Mr. Orchardson's, a splendidly-painted work deficient in subject. It is called "The Shrine of Venus" (313), and seems to introduce us into some kind of side chapel devoted to personal adornment, as two young women are seated, one looking at herself in a glass; and a wig is seen balanced on a stand on the top of the dwarf wall, over which we see the heads of a crowd of people, and over some bits of temple architecture in bright sunshine, according to the artist's wont. The girl looking in the mirror has a splendid head, the painting of architectural detail perfect; but there is no intelligible element to give an interest to the work. Mr. Vynter's "A Corner in the Villa" (291), also being classic figures amid wealth of marbles and (in this case) mosaics, seems to be hung as a pendant or a challenge to Mr. Tadema's; the figures are of more grace, life and interest; but the marble is only imitation graining, in comparison with Mr. Tadema's achievement as a marble-mason. In regard to the latter, by the way, it is odd that he has represented the grain of the marble slabs facing the spectator as continuous from one to the other, although they are distinct slabs, sawn up, we may suppose, separately. Among the prominent pictures in the large gallery (we are neglecting landscape for the moment) is Mr. Swain's "Visit of Charles I. to Kingston-on-Hull" (200), a crowd of horsemen under their heads with the Royal martyr on a white horse at their head, fruitlessly demanding entrance into a town with the three crowns sculptured over the gateway (a good satiric hit); the figure and face of Charles are admirable, and will bear close inspection, and each member of the group of men and horses is distinctive in conception; there is a want of force in the foreground and in light and shadow effect, but this is one of the cleverest pictures of the year. Another very clever and amusing picture is Mr. Rivière's "Of a fool and his folly there is no end" (231), a painting with a high horizon, here a small troop of knights on their heavy chargers are thrown into confusion and sent utter-skelter down hill into the foreground on their startled horses by a motley fool on a monkey at the top of the rise swinging a ladder-rattle round his head; the spectator is most looking down from above on the foreground figures, so that the foreshortening problem becomes a teasing one; the face of the fool, about the size of a threepenny piece, capably and minutely made out: the only question is, was the joke worth all this trouble and talent? Mr. Rivière's other work is, a strange contrast to this, a scene of rising moonlight, "Pale Cynthia" (363), with a grand

mass of cumulus clouds, and a shepherd and dog as small and unobtrusive foreground figures; the mass of clouds seems rather too yellow in tone for moonlight, but there is true poetic feeling in the picture.

Mr. Storey's "Godiva" (326) is in general idea and composition an almost exact repetition, on a larger scale, of a painting he exhibited a good many years ago, called we think "A Danaid"—a nude figure at the foot of a broad stone stair. It is a finely-drawn figure, redeemed from the regulation class of Godivas by a certain nobility of expression in the head; there seems to be rather a curious and unwholesome cold tone in the portions of the figure that are in shadow. In the same room is a very successful painting by Mr. F. D. Millet, "Antony van Corleir, the trumpeter" (378), from "Knickerbocker's History of New York," a picture which has distinctive merit as a capital realisation of the type of men and women of a past time; the "jolly, rosy-faced, lusty bachelors" and the plump Puritan women who, carried on a respectable flirtation with him, are drawn to the life; the picture is one of the few which show real invention in human character as well as skill in painting. In the same category, and superior even of its kind, may be placed Mr. Stanhope Forbes's exceedingly clever picture "The Health of the Bride" (655), a wedding breakfast in humble life, which is pathetic, perhaps almost cruel, in its unflinching realism.—In the portrayal of the commonplace charms of the poor bride, the beaming admiration of her mother, the stolid satisfaction of the bridesmaid who dips her cake in the wine; the action and expression of these and all the other figures are studied with an insight into character which is very remarkable, though the main result is a saddening one; a poignant contrast, by the way, to Mr. Orchardson's brilliant scene of feasting of another type. Another picture of humble life, with a pathos of a nobler kind, is Mr. Kennington's "The Pinch of Poverty" (734), a woman with her boy seated on the plinth of the railings in the street, while the little daughter standing in front offers primroses for sale; the woman's face is most touching in its expression, and the additional element of harmonious composition in the lines and grouping of the figures, though unobtrusive, is not neglected.

Mr. Herkomer's "Chapel of the Charterhouse" (558), obviously a hint from Thackeray, representing the pensioners assembling for morning prayers, is a very strong realisation of the place and the scene, though the figures, we believe, are mostly portraits of persons who are little likely to claim the shelter of this ancient charity (a piece of rather questionable taste); but the picture is a great deal too large for the subject, whether in regard to its intrinsic interest or to the colour combination of large black-gowned figures against a background of varnished woodwork. The same room contains "French Cavalry leaving a Breton City on the Declaration of War" (578), with the peasants lining the road on either side to bid them God-speed, and the Medieval gateway in the centre of the picture; a hard picture, inartistic in general effect, but full of interesting detail. Mr. Crofts, our best painter of battle scenes, is not at his best this year, and the only one of his three works which is a full success is that of "Hampton Riding away from Chalgrove Field" (523), the horse as well as his rider wounded, and seeming to stumble along in an aimless fashion. The painting of "The Knight's Farewell" (82) is intended to have a chivalric side about it, but the general effect is, unfortunately, rather stager.

Mr. Swain's "The Prodigal Son" (136) is a painting of considerable power, though perhaps the main object in it was the painting of the swine, which are grouped round the bent figure of the prodigal, in the foreground of a dreary clouded landscape, the general aspect of which imparts a certain pathos to what would otherwise have been only a piece of animal and figure painting. Mr. Frank Dicksee's large picture of "The Passing of Arthur" (150) is mainly a successful study of moonlight effect, without the interest in the figures which the subject properly demands. Mr. W. H. Bartlett has painted "A Venetian Faction Regatta" (733), a large picture with a crowd of figures, telling its story in a very spirited manner; and Mr. F. Hall's picture of "Adversity" (676), a group of melancholy figures tramping through the snow with a cart, is noteworthy for clever drawing, pathetic pur-

pose, and a remarkably true representation of a snow-covered road. Among the smaller paintings of what is sometimes called *genre* a very good one is Mr. F. Morgan's "Watching and Waiting" (1190), a small cottage girl in charge of a still smaller child, on the grass and screened by a large umbrella from the sun, which is pouring over the field beyond, both landscape and figures equally well studied; the same painter's "Wild Roses" (137) is also an admirable picture of children. Mr. Joseph Clark contributes several charming works, of which the most finished is "The Christmas Dole" (444); a smaller picture of children's devotions at bedtime (195) is very pretty. Miss Rae (now Mrs. Normand) is represented by a large painting of "The Death of Procris" (629), not equal to one or two of her former works, but the helpless drag of the wounded figure of Procris is finely delineated. Among smaller works the half humorous nature is Mr. Maw Egley's "A New Acquisition" (639), a capably-painted interior, where an old gentleman of ornithological tastes is rejoicing over the stuffed figure of a magnificent owl. Mr. Dendy Sadler's "The Widow's Birthday" (1228) shows three elderly gentlemen in late Georgian costume, rival suitors with presents, at the door of a house, where they regard each other with little concealed jealousy; the figures are in full sunshine, and the scene exceedingly light in colour. Among the scenes in rural life few are better than that entitled "Castles in the Air" (1202) by Mr. W. E. Norton, an idyll on the sand-hills between two young people in sabots.

Among pictures which from their size and the importance of their subjects will receive attention are Mr. Solomon's large canvas called "Sacred and Profane Love" (760), a sprawling composition of big figures, of which it may be said that it is a degree less vulgar than his "Niobe" of last year, with the same kind of technical merit. Mr. Hacker's "Return of Persephone to the Earth" (1102) belongs to a rather more refined order of Academic painting, but is very uninteresting. Mr. Reginald Macchelli's "Bacchante" (1131), a nude figure apparently tossed about amid a whirl of clouds, looks as if it had lost its way in going to the Salon, where it would certainly be more at home than at Burlington House. Miss Sassoon's "The Hours" (1152), an allegorical picture of a group of figures dancing round in a ring in the clouds, is meant well, but falls in regard to beauty of form or colour, which is the principal excuse for this kind of painting; the figures are stiff and devoid of inspiration. Mr. Chevallier Tayler's "The Encore" (1132) is a clever representation of the effect of artificial light on the figures on the platform at a concert in a private house, successful in its intention, but not worth doing on this scale. His smaller work, "Confidences" (387) is far superior to this. Mr. F. Goodall has posed a life-size nude wax model of the figure, with wide staring eyes, on a bank of raw green herbage (1245), and wishes us to accept that as Eve's first awakening to consciousness. A similar claim is made for a better-executed but even more prosaic and commonplace nude study by Mr. Val Prinsep (204). If painters can have a chance of reducing a great poetic ideal to absolute commonplace there are a good many of them, at all events, who seem not unwilling to make the most of it.

Among the portraits of the year certainly the most fascinating is Mr. Herkomer's "Lady Eden" (151), of which indeed the charm lies in the spiritual beauty of the lady's upturned face,

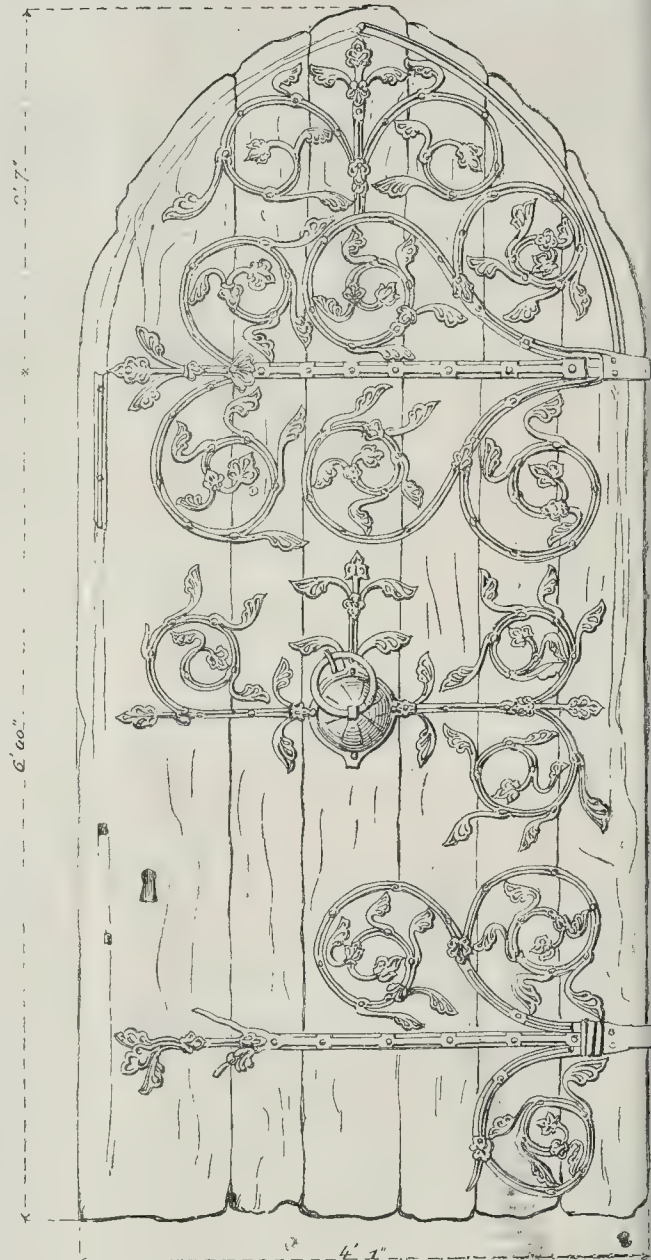
"And looks commercing with the skies—"

but the painter has done justice to it, and the result is a noble work, far more poetic in feeling than most of the so-called ideal subjects in the Academy. A significant contrast to this is the finely-painted group *de l'œuvre* by Mr. Fildes of two "Sisters" (372) whose looks are by no means "commercing with the skies," but rather taken up with their own impressive appearance in fashionably-designed white dresses with pinched waists, relieved against scarlet drapery and the old-fashioned marble column. We presume Mr. Fildes has produced the kind of thing he was expected to produce, and he has done it well and boldly in dealing with this strong effect of white and red—not, alas! Nature's own white and red, but that of the milliner and the upholsterer. A painter, like an architect, must we suppose please his clients sometimes. Sir John Millais must have been doing this in his one portrait (306), which is not likely to give pleasure to any one else, nor



much, we imagine, to himself. Mr. Solomon has a very clever thing, far better than his large painting, in the white-robed portrait of a little brunette child (393). Mr. Oules has a fine portrait of Sir William Bowman (292), and Mr. Herkomer a very characteristic one of "Mrs. Gladstone" (206). The proportion of utterly uninteresting presentation portraits is, if anything, larger than usual this year. Among those that are of higher interest may be mentioned Mr. Oules's "Lady Manisty" (173), Mr. Carter's "Colonel W. Hill James" (1133), a very spirited likeness of a man of striking features clad in a rich brown tweed suit with one bit of blue in the necktie; Mr. W. R. Symonds's "Portrait of an Old Lady" (1155), remarkable for the fine and delicate execution of the face, and Mr. Shannon's "Miss Colley" (1144) a half-length of a splendid young brunette in buff dress with an orange sash, a most effective and taking portrait.

The exhibition contains a considerable proportion of fine and interesting landscapes, the finest of all being a sea-piece (if that is not a Hibernianism) by Mr. H. Moore, "Shine and Shower" (200), an expanse of sea with the waves weltering here dark, there light, under mingled cloud and sunshine; one of the most successful things this painter has ever done. His picture in the First Gallery, "As When the Sun doth Light a Storm" (50) appears at first rather too bold a dashing about of pigments; it must be looked at from a reasonable distance, when it will be recognised as a very powerful representation of flashing sunlight on breaking waves. Mr. Hook's principal work, "Wreckage from the Fruiter" (249) is remarkable for the headlong tumble forward of the mass of wave in the centre; a special colour effect is imparted by the quantity of floating oranges from the wreck. His quieter work, "The Sea-weed Raker" (19) is a fine example of his painting of coast scenes in calm weather. Mr. Brett's only contribution, "The Lion, the Lizard, and the Stags" (417), is rather too much of a repetition of some previous pictures from the same neighbourhood; equal to its predecessors, however. Sir John Millais's "Murthly Water" (74) is a rather hard and realistic landscape, certainly not equal to "Murthly Moss" of last year; his other work, "The Old Garden" (242), a view in a garden with thick square-out yew hedges and a fountain in the foreground, with a bit of distant hill seen over the foliage, is a rich and beautiful work, only requiring (as *Punch* in his peculiar way has hinted) a little more finish and making out of the texture of the hedge. Among landscapes which combine truth to nature with a touch of poetic sentiment, Mr. Adrian Stokes's beautiful work "The Harbour Bar" (756) is pre-eminent: this is a twilight scene looking down the narrow channel through the bar, with the poles stuck up to mark the passage at high tide, out to the sea, to which a troop of fishing-boats with dark sails and their lights just beginning to show in the dusk, are stealing silently out. There is a repose, with a touch of melancholy in this scene, which is beautifully conveyed, and which stamps the author as a poet in his art and in his appreciation of nature. The same praise may be given (in a degree) to a very unobtrusive work by Mr. Arthur Lemon, "The Close of the Day" (333), a work showing very close and sympathetic observation of nature. Mr. Macwhirter gives a fine painting on a large scale of "Constantinople and the Golden Horn" (457), notable for the effect of the clear blue water in the light sunshine. Of Mr. David Murray's contributions by far the finest is "The Moat Farm" (691), about the best thing he has ever done; it glitters with real sunlight, and the distant bit of landscape seen between the two buildings is wonderfully true and real in effect. Among landscapes which produce their effect simply by careful and loving reproduction of everyday scenes and everyday effects, a beautiful example is that by Mr. C. E. Johnson, "An Autumn Idyll" (584), a glade in a quiet English country with masses of trees just reddening into autumnal tints, a shallow pool in the centre, a pathway winding up on the right and disappearing among the trees, which tempts the spectator to wander up it in fancy. Mr. Peter Graham's wild coast scene (602) would seem a very powerful though rather stagy landscape, if we had not seen so many like it; but this eternally repeated trick of effect is absolutely wearying. Mr. Leader's "Dawn of an Autumn Day" (662) is intended as a magical effect of sunlight, but somehow it



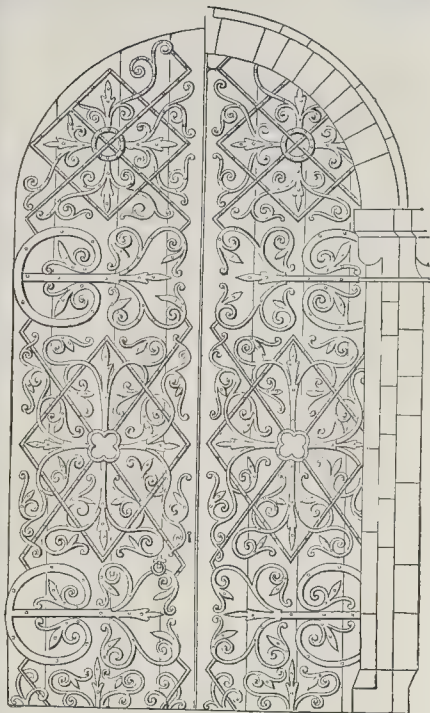
Wrought-Iron Hinges, &c., St. Mary's, Norwich. (See next page).

does not compel belief, it is too smoothed out and steely in surface. His best bit of painting is the sand-hill foreground in "Cambria's Coast" (480), but the sea is really too bad. Mr. Farquharson's "Day's Dying Glow" (717) is a good snow landscape. Among others that should be looked at are Mr. Peppercorn's "In the Meadows" (1775), Mr. Kenneth Mackenzie's "Playground of the Sea" (1222), i.e., the neutral ground between high and low water, seen when the tide is out; the same painter's "On the Shores of Kintyre" (1244) which is still better; and Mr. F. S. Richardson's "Out in the West when the Sun is Low" (1250). On the whole, landscape includes a good deal that is of interest this year, though we sadly miss Mr. Alfred Hunt.

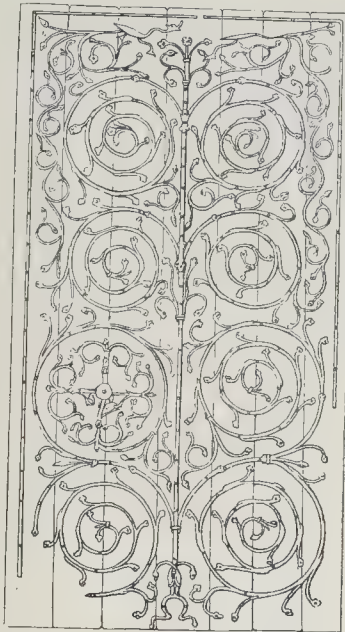
Of the sculpture we will say something on another occasion.

**New University at Chicago.**—A new university will shortly be opened at Chicago, with funds supplied by the Baptismal Unions of the United States. The University of Chicago's building, now closed, a handsome structure on the southern side of the town, has been acquired, and plans are in preparation for enlarging and repairing it.





Doors to Cloister, Durham Cathedral.



Door of Chapter-house, York Cathedral.

# ECLESIASTICAL WROUGHT-IRON DOOR FURNITURE.\*

As so often happens, when you have unlimited time to prepare a subject, you put it off, and the time comes round at last and finds you unprepared. I knew that I had an engagement to be in May, and my idea of May was the summer time, and that seemed so far off that only on Tuesday I realised that May was this week. It has necessitated cutting the subject in two, but it is so vast that the half of it is ample. If in next session you care to hear the sequel of the first, I hope, be in a position to do it justice. Under these circumstances, I feel free to go to the threshold of the subject, and it is absolutely necessary from this aspect to begin with the Romans. The reason for this will be apparent.

We have a very full knowledge of what man blacksmiths could do, owing chiefly to the destruction of Pompeii and Herculaneum. It hardly reminds you that the catastrophe was almost as unexpected as if the crest of Boscawen were to be suddenly blown up and to bury the town. It was so sudden that all the ironwork that was ever in these towns was probably destroyed with them, and we see exactly what the blacksmiths and blacksmiths had done.

We see that they had little love for the art of smithing, and used bronze for art work, and iron only when they wanted its particular quality of strength. There are, however, some hinges and furniture preserved, and these I look on as the greatest possible interest and importance. There is a foretaste about them of our Early English hinge-work, whether because they are technically connected, or whether simply because a method of work of the smith leads to like results when like conditions of requirements are given him, I cannot say; but, looking at the close fact of the resemblance of these hinges to those of a country town towards the south of Italy, and their early date, —A.D. 79,—it is possible to doubt that more to the north, as Gaul, where the working of iron was carried on at a far higher pitch, and at a later date, works

which might well have been the progenitors of our own may have been produced. Barbarian ornament and art fled, of course, at the contact of the Classic art of Rome, but it may have left a smack behind. There is ample proof that the Gauls, and probably therefore the Britons, knew how to weld, chase, emboss, tin, gild, and enamel iron. The discoveries at Bibracte, Alise, Bourges, and the writings of Roman authors, prove this.

A point even more important to us is that the ironwork of Gaul extended over central Europe, and to their neighbours the Franks and Goths, because I want to show that these arts were preserved by the Goths of Denmark and Scandinavia during their isolation, whilst the rest of Europe was in the conflagration attending the break-up of the Roman Empire. The metalwork of Denmark, in fact, is in most respects the same as that of Gaul, but modified on the one hand by an influx of Roman currency in exchange for amber, and on the other by the blackest and most heathenish superstition that ever afflicted any land, perhaps, in any age. All the arts of Gaul (such as damascening and inlaying), except enamelling, were preserved, and in particular that of making most excellent chain-mail armour.

It is now necessary to get on to England. The Britons were Christians practising the civilisation of Rome, with walled cities, and villas, and a large iron industry. The conquering Jutes, Angles, and Saxons were pagans, and, probably, not particularly distinguished for any love of the arts, except of war. This in the first conquests was extermination to the people, but the buildings and fittings must in many cases have been spared, and when arts were revived these remained as models. As soon as the conquests of the Anglo-Saxons began to be consolidated, St. Augustine and other missionaries arrived from Rome, and converted them to Christianity, with the result, of course, that churches were required. Now, it is perfectly certain that these churches would be on the Roman models, just as when English missionaries go to heathendom now their churches are built on Anglican models; besides, as we have seen, a large number of Roman buildings must have been at hand to copy from.

We have thus a ground-work of Roman art, probably tinged with Greek influence, when Greek missionaries arrived from Byzantium and

became English bishops, as in the case of Theodore of Tarsus.

This was the state of things early in the seventh century, when the missions and learning of the Irish, who established themselves in North Britain at about the same period, began to tell. By the date of St. Cuthbert, late in the seventh century, the Romans and Irish were working amicably, and in process of fusion. The Irish, as you know, were devoted to art, and had developed a most beautiful, if peculiar, mannerism, all their ornament that was not geometric consisting of animals and birds drawn out into such intricate arabesques that their identity is all but lost.

It is plain that this fusion most powerfully influenced the Anglo-Saxon art.

Late in the ninth century a further and still more important arrival came to build up English art. The Danish Goths, who had treasured and developed the arts of Gaul, began to settle in England, and to fuse with the Anglo-Saxons. These people must, according to their sagas, have been the most expert smiths the world has ever seen, even royal princes not disdain- ing to become blacksmiths. They regarded their swords as imbued with life, and gave them affectionate names, which have been handed down with their own. Who does not remember Wayland with the sword Mimung, which was so wonderfully tempered that it clove a rival smith, who had spent a whole year in making a suit of invulnerable armour, in two, armour and all, and with so little effort that it was only when the rival was asked to get up and shake himself that he was aware he was in two halves, and, consequently, as good as a dead man?

It was not likely that the Saxons, who at once appropriated the terrible Danish axe, would not have availed themselves of such smiths as these, and we thus have the yeast out of which Early English art was fermented.

Nor was it likely to be long before such warrior races, skilled in working iron, discovered its use in protecting doors. When we consider that for several centuries their church doors might at almost any moment be thundered at by robber hordes, bent on slaughter and pillage, the overwhelming importance of such protection will be understood.

\* A paper by Mr. J. Starkie Gardner, read before the Architectural Association on the 3rd inst., as elsewhere mentioned.



The hinge was, of course, the first point to attend to.

The simplest form of hinge would be a strap of iron bent at one end at a right-angle to clasp the thickness of the door, and then curled to form a socket to work on a peg, or pivot, fixed to the jamb. But we do not find any records of early English hinges of this simple form, perhaps because it could be too easily wrenched away, perhaps because the smiths were too highly skilled to make anything so simple. Certain it is that their early efforts seem to have been devoted to clamping or cramping the hinge, like an eagle's talon, over as much of the door as they possibly could. The most successful, and therefore the most prevalent, form, is a triple strap, the centre one straight, and the lateral curved like the horns of a crescent. The *triple juncta* may have had something to do with the favour in which this form was held, but more likely it was the fact that the starting point or junction of these straps was behind the stone rebate when the door was closed, and, therefore, no pirates could force them off.

As this form was in fashion for two or three centuries, the number of guises under which it appears are somewhat bewildering. The straps terminate almost always in scrolls or foliage, and this supplies the key to age. Rudeness and plainness are, however, no index, nor am I able just now to trace out any particular lines of descent.

Sometimes you will find disconnected straps and bands and ornaments between the hinges, and these often deserve careful study.

It is quite obvious that, however much you might spread and clutch with the external hinges, the woodwork could be burst in, and there is very little doubt that a system of armour-plating the insides of the doors was introduced at an early date, and that this plating, in the hands of our accomplished smiths, took a very elaborate and ornamental character, and perhaps was the veritable *opus anglicum* about which we hear so much and know so little. When the need for this defence was forgotten, and the rude Saxon doorway was replaced by the moulded Norman doorway, or the wood decayed, this decorative system of interior plating was abandoned, and it was more or less bodily, according to circumstances, transferred to the outside, where it looked decorative. On no other hypothesis can we explain the odd state of things on the celebrated Willincote doors. Here are two splendidly early crescent hinges with some particularly beautiful straps, arranged, as a child might place them, in inverted pyramids,—no doubt the work of some Medieval patcher and joiner.

But the Durham hinges\* (see illustration) present us with a far finer example. Here you have the crescent or horseshoe hinge, belonging to the outside of the door, developed into most beautiful scrolly ends, with an intersecting lozenge and scroll pattern of much more delicate work fitted between them. Now it does not need much scrutiny to see that the lozenge diaper has been cut across to make it come in between the hinges, and that it was never likely to have been designed for any such position. The design, though very efficient as an armour-plating inside, would be useless as a protection outside, for the pieces are all separate, and merely tacked against each other, and not welded into one.

The design is as unlike Classic as anything can be, reminding one of Irish carving, like that at Clonmacnois, and evidently produced under the Lindisfarne and St. Cathbert influence. The doorway is of the year 1135. The style of the hinge has been repeated in France, and is there ascribed to early twelfth century. What the date of the ironwork may be I must leave you to decide. Canon Greenwell, who is a great authority, calls it late twelfth century.

Another example of this armour-plating is the well-known one of Hormead. This is not so early, and has perhaps less of the Celtic element, and a good deal of the Danish. The birds are unmistakable; there is something at the top derived from a dragon, and the little curls are quite characteristically Danish. It is in a Norman doorway, and has been called fourteenth century, but it cannot, I should say, be later than the twelfth. Another one is at Skipwith,

\* For the illustration of the ironwork on this door, as well as of that on the door of the Chapter-house of York, which it is the courtesy of the Editor of the *Journal of the Society of Arts*, wherein they appeared (with others) on Feb. 23, 1887, in illustration of a paper read by Mr. Starke Gardner before the Applied Art Section of that Society.

—a design based on circles; and there are many others existing, which I shall be glad to learn something about.

To go back to our horseshoe form, there are two further developments we must notice.

One is the Lincoln Cathedral west door hinge, with the three straps ending in small points, and decorated with small C and half-C scrolls backing on to the straps; it has a very twelfth-century look: and the other a crescent hinge without the central strap, in place of which there is a wholly-detached strap foliated at both ends, and generally rather elaborate. This type is rare in England,—I only know it at Canterbury and one or two other places,—but is quite common in France, and can only have been developed from the earlier form after the need for defence had passed away.

Some really horse-shoe shaped hinges are occasionally used which seem fashioned in compliment to St. Martin, the patron of travellers.

We will now consider the Danish type. When the Danes were converted it was in a half-hearted way, and they never wholly gave up their superstition as the Saxons did, but grafted Christianity on to Wodin and Thor. Their hinged work can always be detected, because it introduces emblems in a lavish manner. A good many exist in Denmark, of course of a relatively later date, since Christianity only began to prevail there in the tenth century, and these are most valuable in enabling us to recognise and track the Danish characteristics here. Few exist in England, and we will only allude to two. They are formed of numerous small detached pieces. That at Staplehurst has been removed from a round to a pointed doorway, and the present arrangement is probably quite different to the original. It still comprises a Viking's ship, fishes, a goose, sea dragon, snakes, crosses, part of a knotted pattern, and a horseshoe hinge and straps. The Stillingfleet example also has a ship, two men, and a reminiscence of the trikele, as well as a strap like a knotted cord, which is very usual in Danish work, and not elsewhere—all probably of profound import and tending in the direction of propitiating the evil one.

This Danish influence gradually merges, and is at last only traceable in thirteenth-century hinges in a dragon or some other uncanny beast poked away where it can't be readily discerned.

The fable that the skins of sacrilegious Danes were stretched on church doors shows their connexion with the hinge-work, and is due to the custom of lining them with scarlet skins to set off the iron, which was commonly gilt or tinned.

We now deal with the more distinctly classic type of hinge.

This we may take as consisting of essentially a central stem branching into scrolls, often mingled with foliage. The oldest in type of design, if not themselves so very old, are those at St. Albans. These remind one more than any others of the hinges shown in the Cadmon MS. in the Bodleian, acknowledged to be late tenth-century. They each consist of six very much convoluted scrolls springing from a main stem, with cross-hatched surface, and introducing in each case a little foliage. Of course, in the case of an inland town, the need for defence would be less pressing, and they may have ventured a form here that they would not in more exposed places. The type is, anyhow, excessively rare at an early date, but it gave rise to several others, notably the strap which runs straight out for a good distance, and then suddenly branches into a tuft of leaves and scrolls, like a pollard. This was a favourite in France, though derived from England, as the Cadmon and Cotton MSS. show. The stem is often reeded as if formed of a sheaf of stems bound together.

The door to the crypt at Wells shows a perfectly unique development of the scrollly hinge from a central stem, which looks as if an English design had been entrusted to Danish hands. Anyhow, there are innumerable clusters of perching birds, which look like guillemots introduced in a floral manner. This work is certainly not now *in situ*, and must have been removed when in disrepair from an outer door.

Towards the twelfth century all these various elements had crystallised, or congealed, as it were, into a definite style, which we may call *par excellence* the Early English. The need for defence had passed away, but not the traditions which it gave rise to. The Celtic and the Classic have fused and produced a rich system of easy-flowing yet elaborated foliated scrollwork, while the Danish has only imparted excel-

lence of work, and its lingering traces survive in an occasional dragon or grotesque monster. The emblem selected, almost with one accord, is the vine, that emblem of the Church. Its fruit, foliage, and tendrils, and trailing, climbing, drooping habit, fitted it in a supreme degree for its high place as the basis for the design of all the door coverings for nearly a couple of centuries. The treatment is highly conventional, the leaf having become evolutionised into either symmetrical or a symmetrical trefoil, and the fruit being more like a crude representation of a fir-cone. The plant had already become conventionalised as early as the tenth century, but does not seem to have been applied to ironwork before the twelfth. Its origin is Roman or Byzantine, but it does not lend itself to defensive treatment, but to decorative only, and, therefore, its use for doors could only have become general in ages when danger had passed. It seems to have been fairly spread over England, and thence found its way to France, but it clusters chiefly in the eastern counties, and seems more common in Bedfordshire than anywhere else. It takes on the scroll and horseshoe form, some of the best known examples being at Leighton Buzzard, Eton Bray, Uffington, St. Mary's, Norwich\* (see illustration); but the loveliest, because the most unfettered and slender treatments, are found on the insides of doors. The magnificent example in St. George's Chapel is arranged in a large vesica-like diaper; Chester Cathedral is very rich; York, where the whole plant is represented growing from the root, which is very prettily treated to the top, where it overflows and falls down (see illustration)—with the little Danish dragon tucked away at the top. Now I shall introduce you to two remarkable cope-chests, because I want to illustrate a special point. One, you see, is the conventional vine; what is the other? One is all curves, softly flowing; the other is spiky, jerky. It suggests to me that if one is borrowed from the vine, as we know it is, the other is equally taken from the corn, and what would be more natural, if a foil were required, than to illustrate the second element of the Sacrament? We have the same foil in several cases, such as Sens, but most notably in the grand example of hinged work I shall now introduce—namely, the Eleanor grille—for, though a grille, it is really composed of hinged work laid upon a frame of iron instead of wood. Here you see the majority of panels taken from the vine, with here and there one of wholly different growth, a reminiscence of the stiffer corn, and in the midst of all the little animal's heads—perhaps a legacy of the Dane.

This application of hinged work was evidently a success, for we find that the Abbey of St. Denis was not to be outdone, and ordered a similar one in which the same dies appear to have been used.

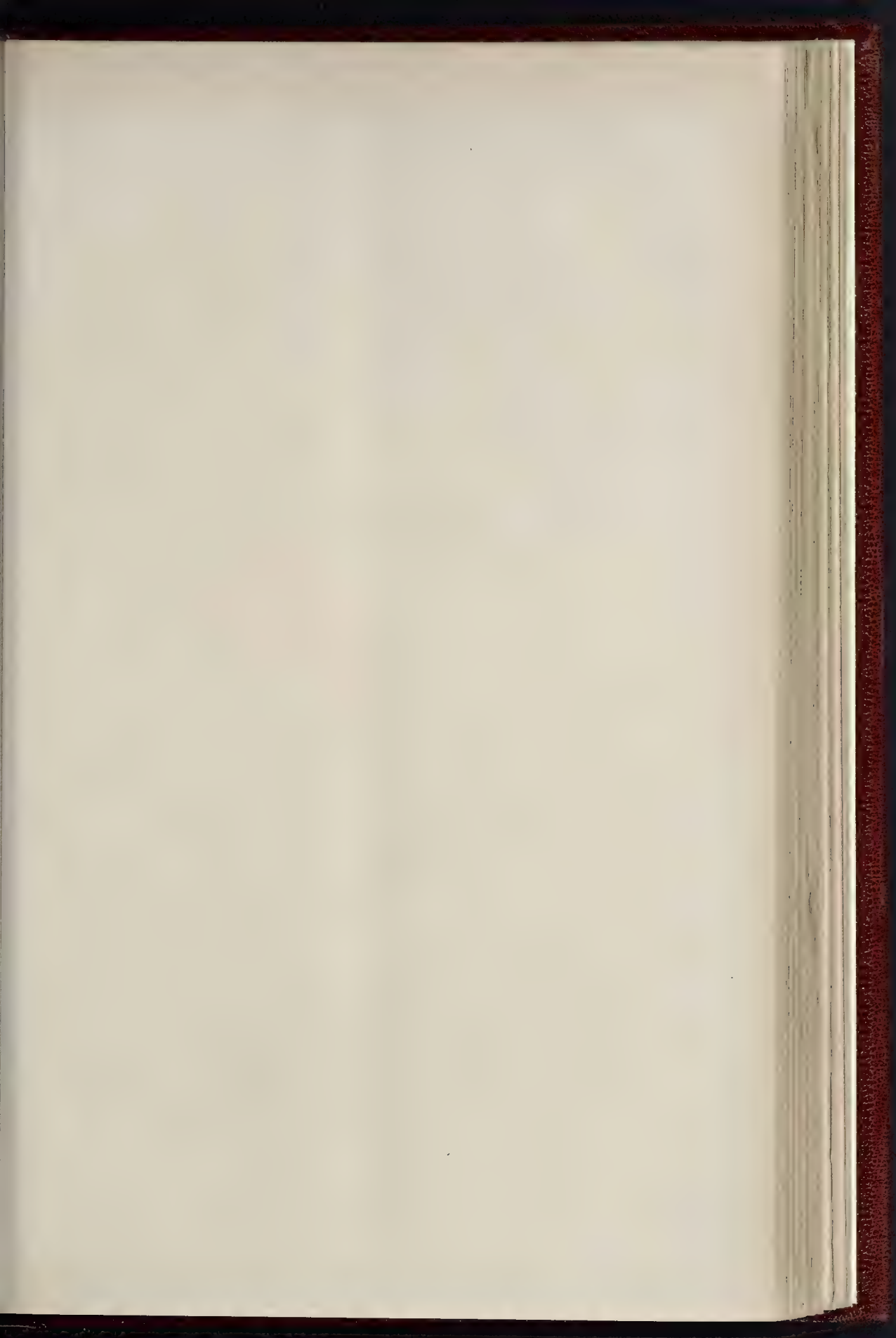
The latest large works of this character are the hinges to Merton College, late thirteenth century, of the horseshoe form, very floridly treated. Up to this date the vine and the corn are the only plants admitted, with a solitary exception at Worksop, in which we have a most beautiful treatment of the lily. This, with the thistle and passion-flower, nearly ousted the vine in the fifteenth century.

Now we must pass to Paris. You must have been struck, or perhaps I forgot to point it out, with the fact that all our types of Early English ironwork have their counterparts in France. Every kind of hinge that we have seen, except the very earliest, have, if not their exact counterpart, at least replicas by the same hands, and it is the same with every grille. There is no difference between English and French work, and, I believe, we might even say English and German and Spanish, down to the fifteenth century. Now we are perfectly certain regarding our own works that they are by Englishmen, for in the cases of the Eleanor grille and the Henry V. Chantry, we know the men's names and the prices they were paid. These two works,—and indeed, all the others,—are very peculiar. How did they get to France? Did an architect supply details, did the French smith come over to copy, and did our English smiths lend their stamps or matrices for the leaves and flowers? Or were they simply made in England and exported?

The latter, I maintain. The Cadmon MS.

\* By the kindness of Mr. Starke Gardner, we are enabled to give the accompanying illustration of the hinges, &c., at St. Mary's, Norwich.











"FIRE"



"WATER"

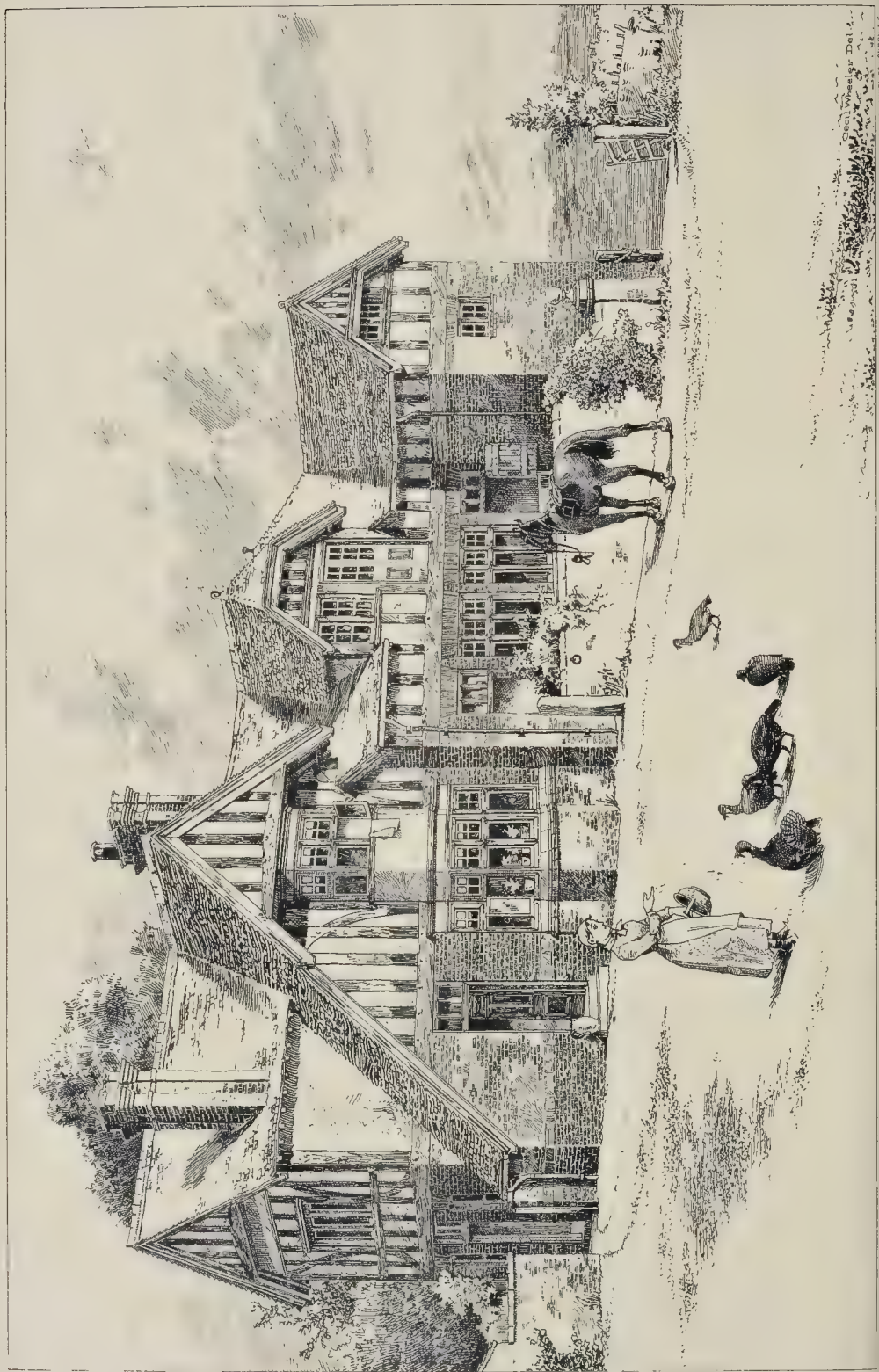
DESIGNS FOR STAINED GLASS WINDOWS.—By MR. CHRISTOPHER W. WHALY



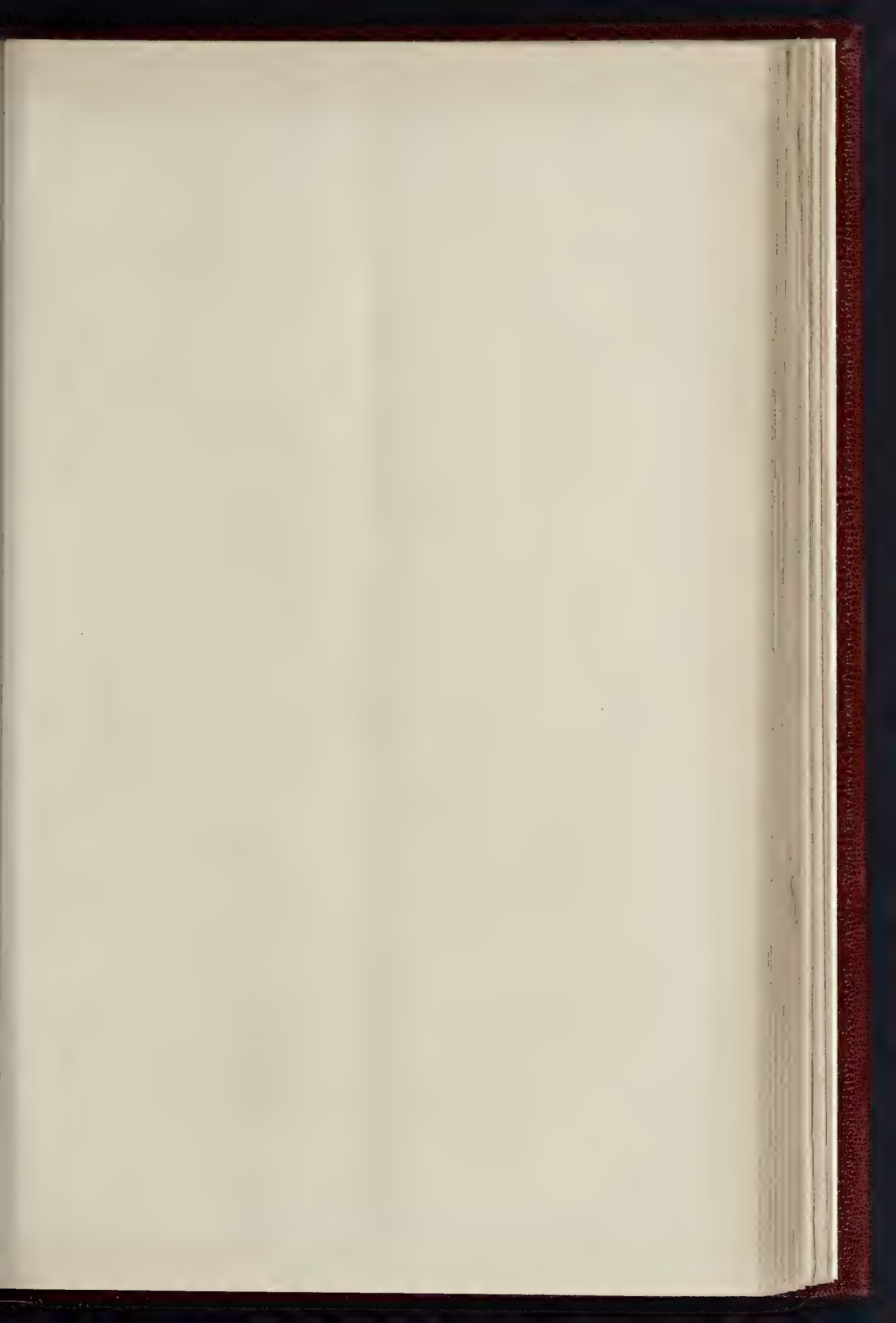




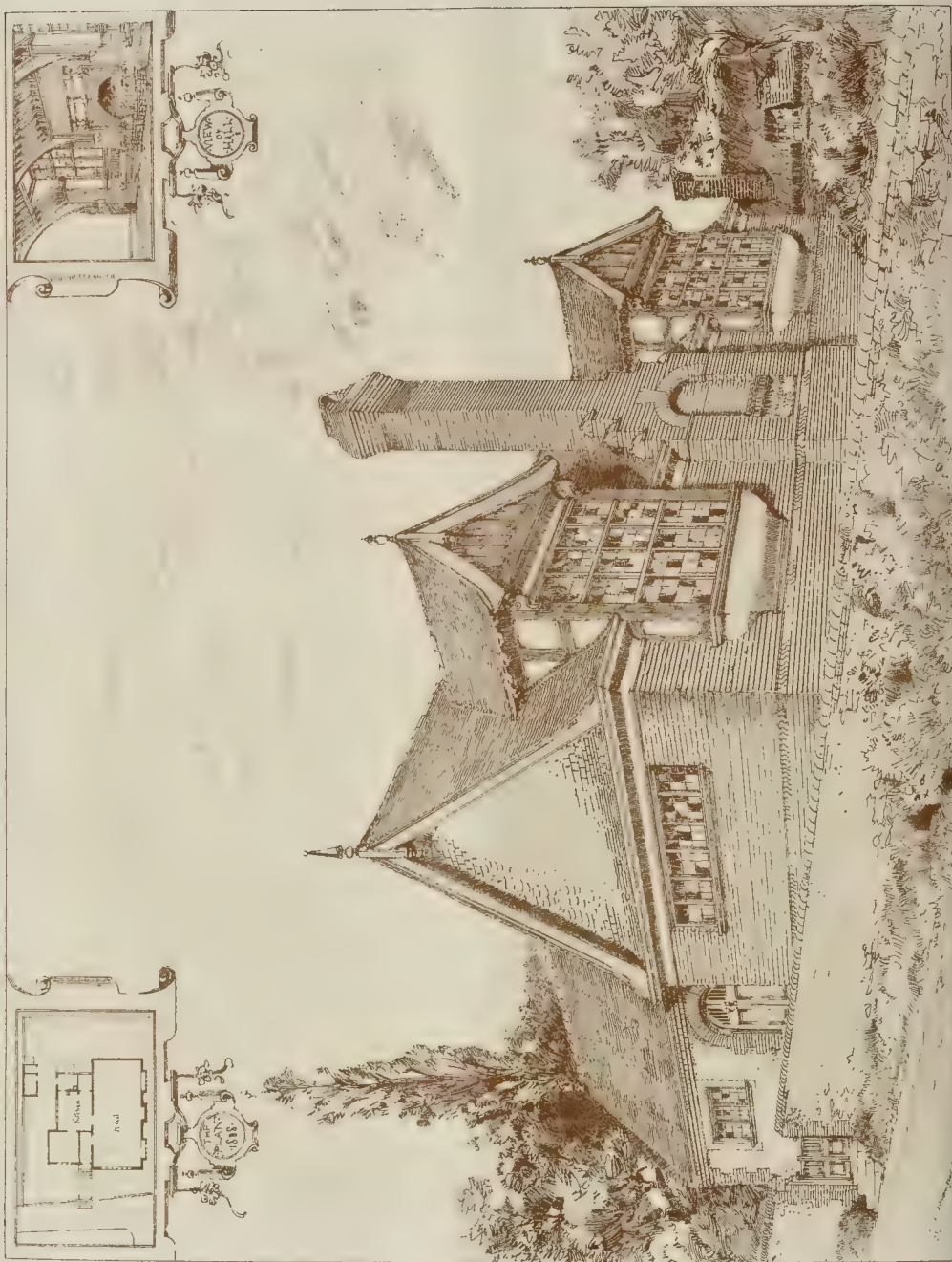
THE BUILDER, MAY 11, 1889



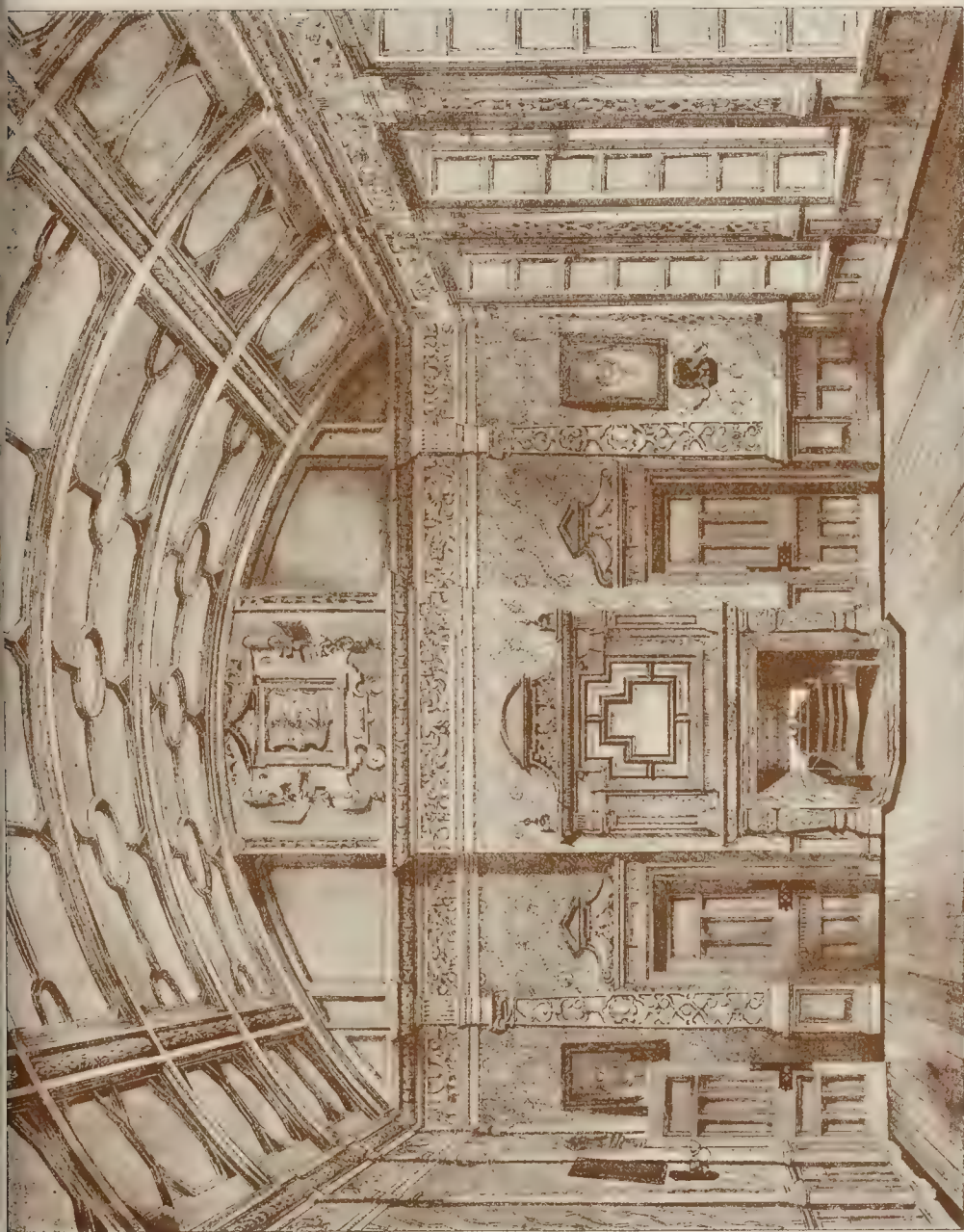




THE BUILDER, MAY 11, 1899.



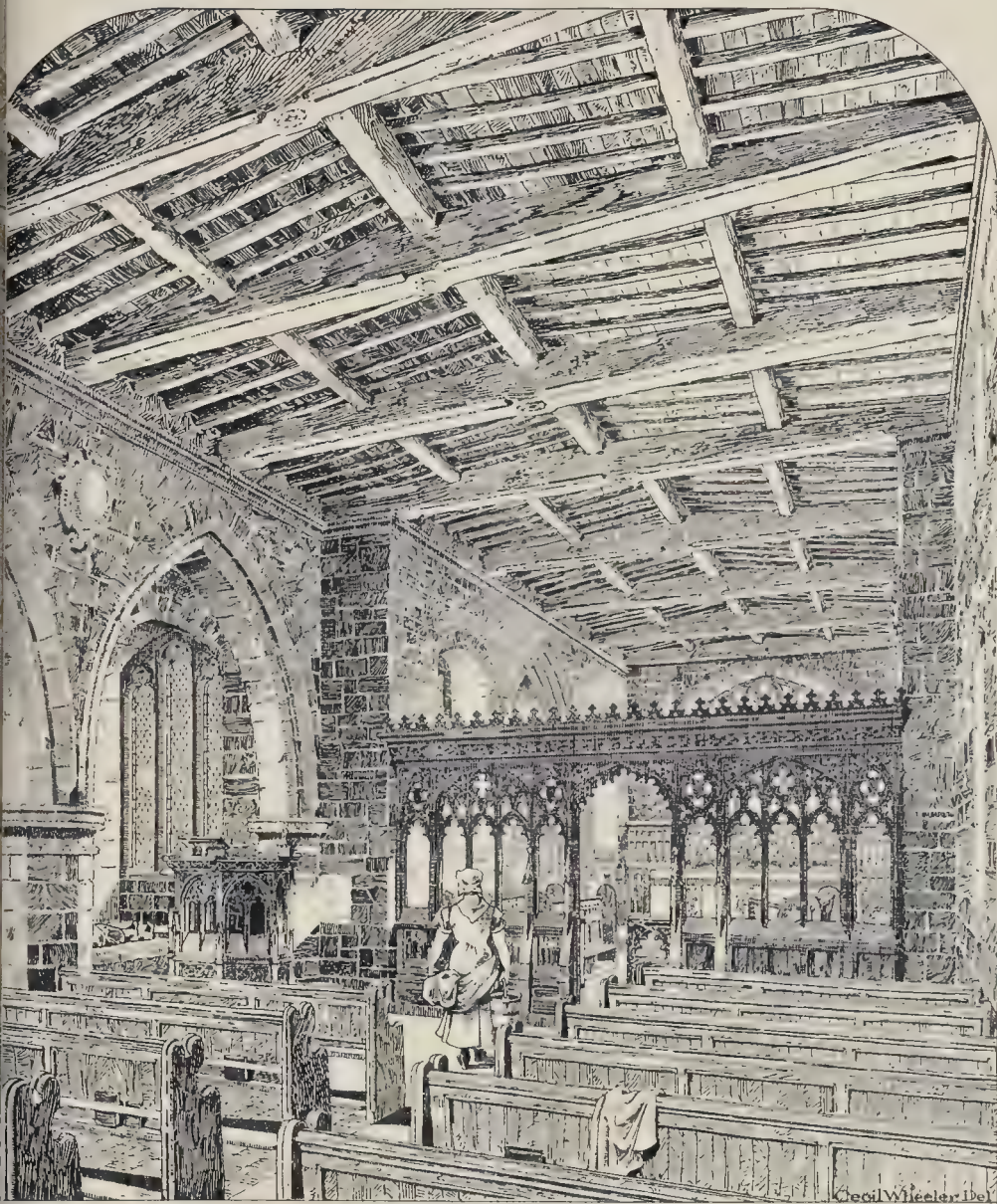




THE COUNCIL CHAMBER, MUNICIPAL BUILDINGS, WEST HARTLEPOOL.—MR. R. KNILL FREEMAN, F.R.I.B.A., ARCHITECT.





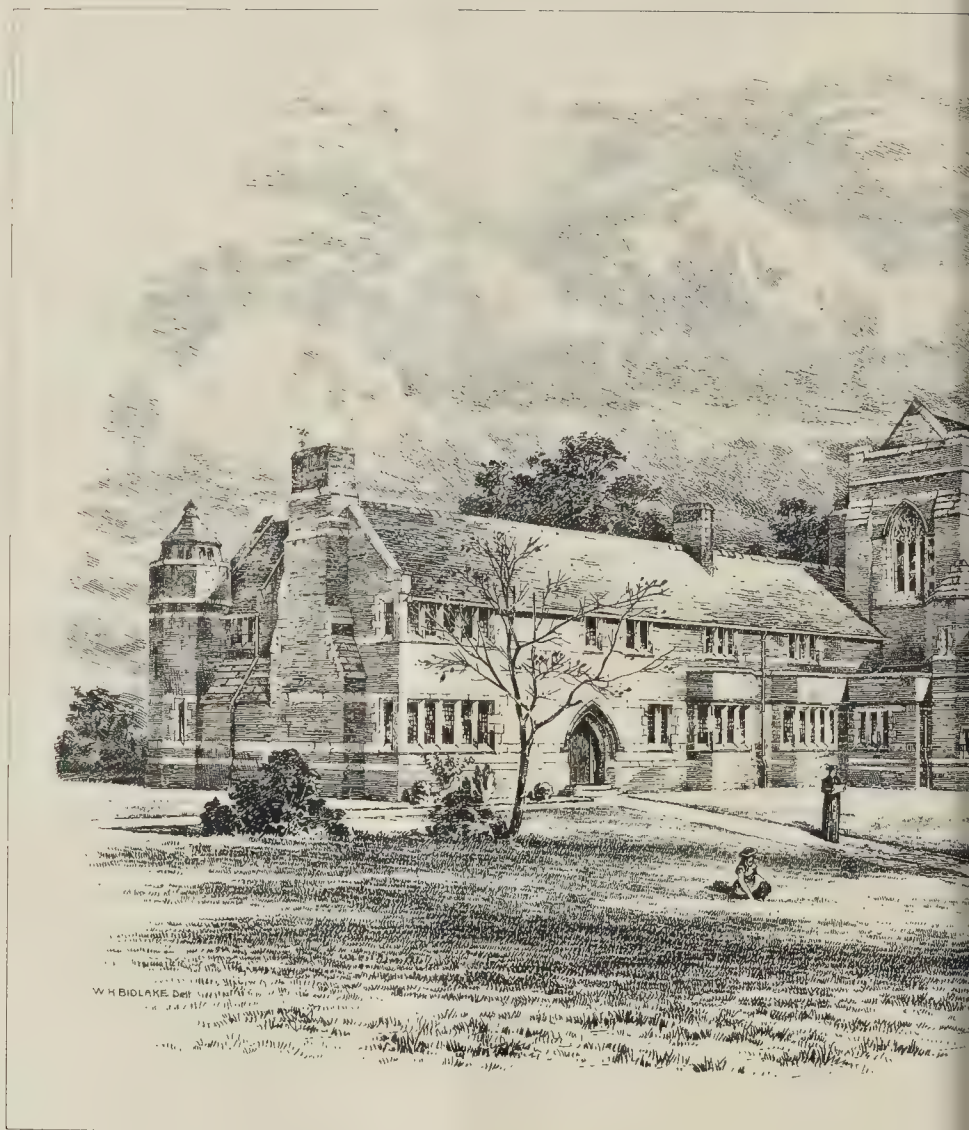


RESTORATION, RADBORNE CHURCH, DERBY.—MESSRS CHORLEY & CONNOR, ARCHITECTS.









ST. CLARE'S (R.C.) CHURCH, SEFTON P.



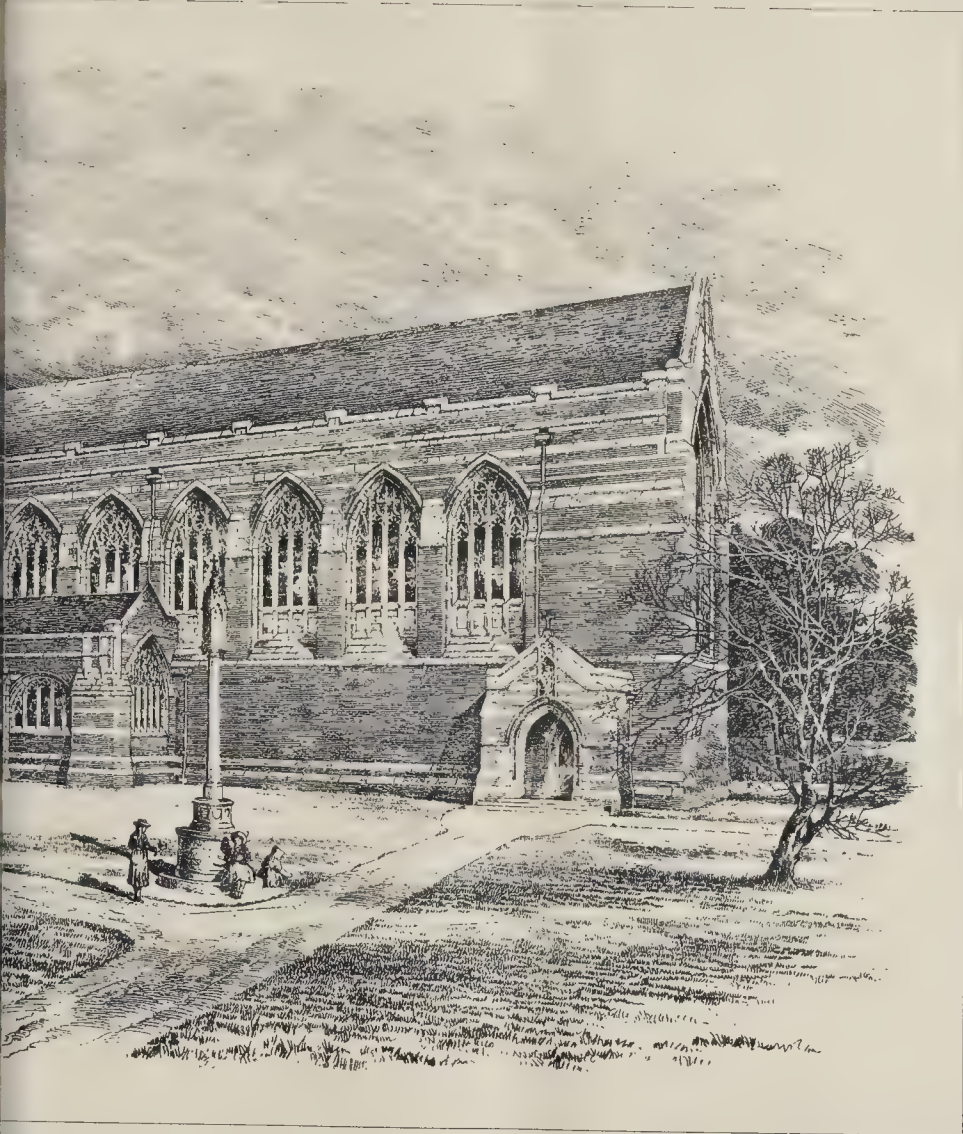
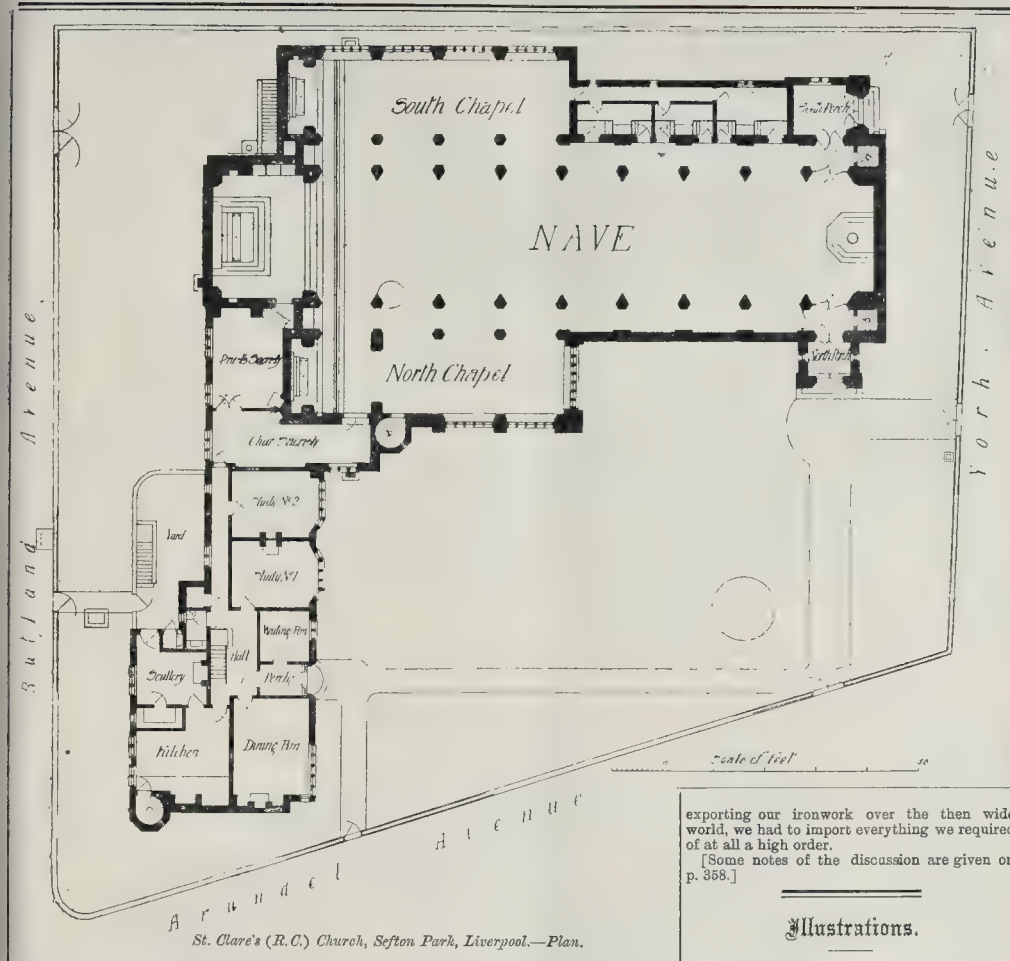


PHOTO LITH. SPRAGUE & CO. 22, MARK LANE, LONDON. E.C. 4.

—MR. LEONARD STOKES, A.R.I.B.A., ARCHITECT.







St. Clare's (R.C.) Church, Sefton Park, Liverpool.—Plan.

shows that English smithing was already of a high order half a century before the Conquest. When the Conquest came, Norman craftsmen supplanted the English, and the English names of mason, carpenter, joiner, tailor, have been lost, but not so with the smith. The French smith held his own, and it was the French smith, the mere farrier, who played the completely subordinate rôle of shoeing horses. What could show more completely the superiority of the English artist-smith than this delegation of the mechanical branch only to the smiths of the conquerors?

The French never were smiths in Medieval times; they have lost their own term, "*ferrier*," which we have preserved, while their present word, "*forgeman*," is modern.

Now we can approach our last picture, the grand hinges of Notre Dame,—the most colossal in the world, each of the hinges being large enough to cover an ordinary church door.

They represent the terrestrial paradise, and whether for richness or execution, represent the *ne plus ultra* of such work. They are the most surprising pieces of metal work of antiquity. They adorn the principal portals of the central church of the capital of France, and yet not the faintest tradition exists concerning them. The French, who began to treasure the names of their artists since the days of St. Eloi, can do nothing more than ascribe them to the devil,—and why? Because they were made in England,—because they were dropped down suddenly complete. They do not fit, and are not likely to have been made on the spot. Those who bought them cared not to insist and impress on the public mind that they were made in a foreign country,—especially England, which had already developed

hostile rivalry. This oblivion always follows the import and export of any great work, the nine days' wonder is forgotten where it is born,—out of sight out of mind,—and the mere episode of its arrival is not long remembered in its new home. The same thing is seen everywhere. Look at the magnificent iron screen of St. George's Chapel. What do we know about it? Nothing. Because it came ready-made from Flanders.

Time is now up. No doubt I have left off just where you would have expected me to have begun. I hope I have proved, however, that English art, built up as Greek art was, from the accident that it was the meeting-place of many styles,—was in metal-work a real and living one. It came to perfection in those manly days when our ancestors were winning our parliamentary freedom. It was an art untrammelled, in which the smith was as free to devise his subject as the artist is to devise his picture. The forms evolved are, therefore, essentially forms characteristic of iron beaten while soft and yielding,—utterly unlike those of the contemporary wood and stone. No file nor drill nor saw nor lathe was used, but only the hammer, the anvil, and the punch.

When the smith's wings were clipped, his art failed. Some wave of fashion,—the Crusades, or opening trade with the East,—brought a taste for Oriental design. The choir gates at Canterbury are Saracenic. The Henry V. Chantry grille is Saracenic, with Italian modifications. Very many of our church door-handles are absolutely Moorish. This chopped and stilted treatment of iron which he had no part in inventing, the smith could take no interest in. This imposition of foreign design, unfit for the material, caused smithing to wane and gradually die out so completely, that two centuries later, instead of

exporting our ironwork over the then wide world, we had to import everything we required of at all a high order.

[Some notes of the discussion are given on p. 358.]

### Illustrations.

#### ST. CLARE'S (R.C.) CHURCH, SEFTON PARK, LIVERPOOL: EXTERIOR.

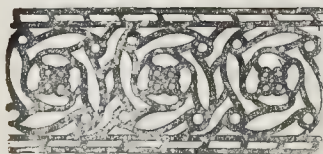
**T**HIS church is being erected at the corner of Arundel and York Avenues, Sefton Park. The presbytery, however, is not being built at present. The materials used are local bricks, with Storeton stone dressings. The church will hold about 600 people, and is the gift of two Liverpool gentlemen, Messrs. Frank and James Reynolds. An interior view was published in this paper on May 3rd, and the drawing of which our illustration is a reproduction now hangs in the Architectural Room at the Royal Academy. Mr. Leonard Stokes, of London, is the architect, and the builders are Messrs. Morrison & Sons, of Wavertree, Liverpool.

#### DESIGNS FOR STAINED GLASS WINDOWS.

**T**HESE window designs are reproduced from cartoons by Mr. C. W. Whall which were at the Arts and Crafts Exhibition last autumn, when we remarked upon their merits, especially that entitled "Water," both in regard to the original inventive fancy shown in them, and their suitability for execution in stained glass. The figures are from an uncompleted series of pencil designs illustrating the "Te Deum," being two figures from a design of the "Four Elements," illustrating the verse "All the Earth doth worship Thee."

The treatment of the heads of the windows illustrates a fancy of the designer for producing decorative effect and expression in the leading; in the original cartoons the glass was shown entirely white here, but Mr. Whall has introduced a slight difference in tone for this illustration, in preference to the plain white glass.

A similar decorative treatment is shown in the annexed bit of border design in white glass.



Mr. Whall's exhibits at the Arts and Crafts Exhibition, and subsequently at the Liverpool Art Club during the Art Congress last year, showed a great variety of work, partially experimental, but all marked by ability and inventive power. He has now determined on devoting himself specially to stained-glass design, and if he can produce work like this which we illustrate (unfortunately and necessarily without the colour element), he ought to meet with opportunity and success.

#### VILLAGE CLUB HOUSE, HARTEST.

The club house illustrated herewith has been built for the use of the villagers of Hartest, in Suffolk. It consists of one large hall, about 45 ft. by 22 ft., with a kitchen and offices and caretaker's room attached. A swing-hatch from the kitchen communicates with the hall. The materials are red brick, tile-roofs, weather-tiles, and rough-cast coloured with ochre lime wash. The framing to the dormers is of oak, with oak panels in the gables. The total cost has been about 800*l*. The works have been executed by Mr. Cadge, builder, of Hartest, from the designs of Mr. Reginald T. Blomfield, M.A., architect.

#### COUNCIL CHAMBER, MUNICIPAL BUILDINGS, WEST HARTLEPOOL.

The New Municipal Buildings, West Hartlepool, which were formally opened on the May 1 by Prince Albert Victor, are centrally situated, and provide the usual municipal offices, also offices for the Guardians and the School Board. The Council Chamber is placed on the second story, and extends along the principal front. The Mayor's parlour is arranged *en suite*, and corresponds in general treatment with the Council Chamber. The building has been designed with regard to future extension. The materials used for the exterior are small, dark red bricks, with bases, cornices, and other dressings of terra-cotta. The roofs are covered with strawberry-coloured tiles. The cost has been about 7,000*l*. Mr. Joseph Howe, of West Hartlepool, was the contractor, and Mr. R. Knill Freeman, of Bolton and Manchester, the architect.

#### STABLES, HAWKSHILL, LEEDS.

THESE buildings, now in course of erection, are of brickwork, with half-timbered and cemented work to the upper portions, and with red-tiled roofs. The accommodation comprises coachman's house, stable with two loose boxes and two stalls, harness-room, piggeries, and cow-house. The architects are Messrs. Chorley and Connon, Leeds; the builders being for brickwork, &c., Mr. George Burnel; for joiner's work, Messrs. Tomlinson & Son; for tiling, Messrs. Watson & Worsnop; for plumbing, &c., Mr. I. E. Bedford, all of Leeds.

#### RADBORNE CHURCH, NEAR DERBY.

THE drawing of this church, now hung in the Architectural Room at the Royal Academy, shows the appearance it presents since its restoration at the cost of the squire, Mr. Reginald Chandos-Pole. The work comprised a new chancel-roof, east window, screen, reredos, choir stalls, &c.; a new organ chamber; new flooring to the nave, and re-seating the same; stripping walls of plaster and pointing, &c. The whole of the restoration has been a thoroughly conservative one, not a single stone of the original fabric having been disturbed unnecessarily. The east window has been filled with glass by Messrs. Heaton, Butler, & Bayne. A new organ, by Messrs. Conacher & Co., of Huddersfield, has been placed in the church at the cost of the rector, the Rev. William Chandos-Pole. The whole of the work has been carried out by Messrs. Tomlinson & Sons, of Leeds, under the direction of the architects, Messrs. Chorley & Connon, Leeds.

#### THE ARCHITECTURAL ASSOCIATION.

THE thirteenth meeting of this Association for the present session was held on the 3rd inst., in the meeting room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

Mr. W. H. Barker was elected a member.

Mr. T. E. Pryce (Hon. Sec.) read the list of nominations for the new Committee, Mr. Leonard Stokes being nominated as President, and Messrs. W. Burrell and T. E. Pryce as Vice-Presidents. He also stated that Mr. Henry Lovegrove had been nominated as President, his paper being signed by Messrs. C. G. Baker, J. H. Richardson, and Frank Massey.

Votes of thanks were passed to Mr. J. Starkie Gardner and Mr. Clement Heaton for allowing the members to visit their works, and to Messrs. Goldie, Child, & Goldie, for permitting the members to inspect the new church in Spanish-place.

The annual dinner of the Association was announced to be held at the Holborn Restaurant on June 5. The ladies' concert of the "A.A." Lyric Club, it was also announced, would take place on Thursday, 23rd inst., in the Galleries of the Institute.

The Chairman drew attention to a collection of the late Mr. George Devey's sketches, which had been presented to the Association by his executors.

Mr. J. Starkie Gardner then read a paper on "Wrought Iron Door Furniture (Ecclesiastical)." This paper, which was illustrated by lantern views, we print, with some of the illustrations, on another page.

Mr. Leonard Stokes, at the close of the paper, proposed a vote of thanks to Mr. Gardner. The lecturer was rather more historical than he had anticipated it would be—in fact, he had rather thought Mr. Gardner would have treated more of modern door furniture, as he knew so much about the subject, and would have told them how to design a modern hinge. It had never struck him that the ornamental ironwork to be seen on so many old doors had been intended primarily for strengthening the door, but rather that, people being obliged to have hinges on their doors, they had endeavoured to make them as ornamental as possible. One interesting point which had been raised was the question of having the hinges inside instead of outside the door. Now-a-days the hinges were put on the outside because, he supposed, they showed more; while in the olden times the inside position was perhaps considered to be the more important, as strengthening the door. He differed from Mr. Gardner on that point; the right place to strengthen the door being, to his mind, on the outside.

Mr. R. Langton Cole seconded the vote of thanks, and said that the lecturer had demolished one cherished dream of his early youth, viz., as to the Danish skins. There was a celebrated door at Dartmouth, which had lions or leopards upon it, like those mentioned by Mr. Gardner, and he always understood that the skins upon such doors were those of real Danes. The first Danish door which had been exhibited on the screen showed a distinct arcading, suggesting a Norman, with perhaps a somewhat Saxon balustrade treatment of pillars supporting it, and he would like to know whence it came. As to the beginning of the vine pattern, he understood Mr. Gardner first to say that it occurred in the tenth century, and afterwards that it did not belong to anything earlier than the twelfth century. He would like to know exactly what Mr. Gardner had meant by that?

Mr. F. T. Baggalley considered it was exceedingly useful to the members that gentlemen like Mr. Gardner should come and tell them how to design those things, and what points they had to consider in making their designs, so that they might be carried out by practical men. The strong resemblance between French and English ironwork had never struck him before; but he had observed how very different the treatment of the German ironwork was to anything he had seen elsewhere, most of it being also of a very high character. The most interesting things in German churches were the iron and wood work, and he hoped in any future sequel to the lecture, Mr. Gardner would tell them something about the German ironwork.

The vote of thanks was then put, and carried by acclamation.

Mr. Gardner, in replying, said he would as soon have given a paper on the practical branch of the subject, but the members were welcome to see it at his works whenever they chose. In

the absence of forges, and everything necessary to illustrate it, he was afraid that the members would have found it rather a barren topic. Of course, he could have conveyed a general impression as to what work was expensive and what was inexpensive, but a few minutes at a forge would put them in possession of all that knowledge in a much more complete manner. The practical part of the old hinge work was that it was entirely made with the hammer and anvil, no screw-drivers, drilling-machines, saws, or files being used in its production. It was simply knocked off the anvil with the hammer. The later hinge work, and especially that of Germany, was a mixture of the hammer work, and of file and saw pierced work; in fact it was the work of the locksmith. It was very beautiful, but was altogether different from the old work. It had quite a different spirit and sentiment, the one being simply decorative, while the other, as he had endeavoured to show, was intended for defence. In no other way could they understand the forms of great strength which were so widely spread. With regard to Mr. Cole's remark as to the Dartmouth door, the hinges with lions or leopards were undoubtedly as late as the seventeenth century. They were very curious, because they were of a date when there was hardly any smithing at all in England; it was then the dark age, before the dawn,—the dawn being the reign of Charles II., who at the Restoration introduced French manners and customs, and with them a love for ironwork. The French revival of ironwork preceded the English revival by some thirty or forty years, the latter taking place only in the reign of Charles II. The Dartmouth hinge, like many others, was the result of a sort of spasmodic effort all over the country, being distinguished by a spirit of exuberant loyalty showing itself in oak-leaves, crowns, lions, or something which denoted the feeling of the time. As to the Danish skins, it was well known that these were skins of animals; they had often been tested, and the whole idea of their being human skins was a mere myth. With respect to the vine-pattern, he had said it appeared in MSS. of the tenth century. In the Caedmon MS. it appeared in the shape of sculpture, and wall decoration, but it was not applied to ironwork until the twelfth century, because ironwork was required to be sturdy, he imagined, and a weak form was not available. He was simply tracing the origin of the ornament in its application to smith's work. In conclusion he hoped to be able to continue the subject on some future occasion (applause).

A cordial vote of thanks was passed to the gentlemen who had so ably contributed to the amusement of the members at the recent *société* of the Association, as reported in our last issue.

#### Birmingham Architectural Association.

A well-attended meeting of this association was held on Tuesday evening last, when a paper entitled "The Cross in Art" was read by Mr. J. W. Tonks, who described the origin and development of the various forms of the cross, and urged that its great use, whether as the jewelled ornament of a lady or to regulate the plan of a cathedral, was due largely to its symbolism of the Christian faith. In speaking of the many forms which the cross has assumed, Mr. Tonks described its evolution from the plain equal-armed cross called the cross of Constantine, and showed the development of the Passion cross and its varied elaborations keeping pace with the growth of realism by which the crucifix supplanted the plain symbolical cross. Mr. Tonks instanced the crosses of SS. George, Andrew, and Patrick in the Union Jack and the many forms of cross used by the Crusaders as representative of the various forms adopted, and showed an impression of the seal of Rochester, in which Christ is shown as suffering crucifixion on a X-shaped cross, as an early example in which the symbolism had not given place to the realism of a later date. At the close of the paper, which was illustrated by a number of interesting drawings, a very hearty vote of thanks was, on the motion of Mr. T. Naden (president), supported by Messrs. Doubleday, Cotton, and others, unanimously accorded to Mr. Tonks for his able paper.

**Design for Friars' School, Bangor.**—In the plans of the design by Messrs. Oliver & Leeson, given on p. 318 *ante*, the scale was figured wrong; the divisions marked as 10 feet should represent 20 feet. The mistake was that of our draughtsman.





House at Cohasset, Massachusetts.

HOUSE AT COHASSET, MASSACHUSETTS.

This is a house built from the designs of Mr. R. W. Emerson, of Boston. It is built of random stone-work, at a cost of 25,000 dollars. Two views of it are given.

**Examinations at the Surveyors' Institution.**—Too late for insertion this week we have received from the Secretary the results of the recent examinations for the Professional Associateship. The list shall appear in our next.

THE ART-UNION OF LONDON:

ANNUAL MEETING AND PRIZE DISTRIBUTION.

The annual meeting of the Art-Union of London was held on Tuesday last, in the Adelphi Theatre (lent for the occasion by Messrs. A. & S. Gatti). Mr. James Hopgood, Member of Council, occupied the chair, in the absence of the President, the Earl of Derby. The annual report, read by Mr. Hallett, said:—

"The promised improvement in the general state of business not having yet reached the circle of our subscribers, the Council have to report that the subscriptions for the present year amount to 5,338*l.*, being less than they had hoped.

The following is a brief summary of the receipts and

expenditure: a detailed account will, as usual, be printed in the report.

|                                                                                   |             |
|-----------------------------------------------------------------------------------|-------------|
| Amount of subscriptions.....                                                      | 25,338 4 0  |
| Allocated for prizes.....                                                         | 21,285 0 0  |
| Set apart towards providing works of art for accumulated payments .....           | 397 7 0     |
| For print of the year, exhibition, report, and reserve ...                        | 1,081 4 2   |
| Agents' commission and charges, advertisements, printing, postage, rent, &c. .... | 2,574 12 10 |
|                                                                                   | 25,338 4 0  |

To the local honorary secretaries and agents in all parts of the world we have, as usual, to express the thanks of the Art-Union.



The amount to be expended on prizes will be thus allotted:—1 work at £100; 1 at £50; 1 at £20; 4 at £20 each; 3 at £25 each; 6 at £20 each; 10 at £15 each; and 12 at £10 each; in addition to 25 "Bellerophon" repoussé bronze vases; making, with the prizes given to unsuccessful members, 256 prizes.

The report then went on to mention the decease of Sir Walter Stirling, Bart., of Faskine, Lanark, who was one of the oldest members of the Council. In January last died Mr. Edward Lear, the author of the "Book of Nonsense." "As a painter," says the report, "Lear had a rare sense of the dignified romance and beauty of classic lands, and was a most able depicor of rocks, trees, lakes, clouds, and the sea. The late Earl of Derby, a warm lover of Italian and Greek landscape, sent the youth into Italy and Greece, where he painted numerous views of Albania, Macedonia, and the Aegæan." The death of Mr. Frank Holl, at the early age of forty-three, was next referred to as leaving a sad gap in the ranks of our foremost portrait-painters. "In the autumn of 1888 died Mr. T. Gambier Parry, of Hingham Court, who, although generally known as an eminent amateur, has rendered a very real, indeed an unique, service to art. This consists not in his contributions to art literature, albeit they are entitled to every respect, but in his invention of the spirit-process of mural painting, whereby the ravages of time, and more especially of damp and atmospheric changes, are, relatively speaking, set at naught. He first published his invention in 1863, and proved its value in his own church, at Hingham, where he acted as his own architect, designer, and stained-glass painter." On the 24th February died Mr. P. H. Delamotte, at the age of 68 years, Professor of Drawing in King's College, London, and a well-known artist, who began to contribute to public exhibitions in the Royal Academy in 1861. He was the author of several books, essays on art, drawing, photography, decorations, and antiquities. Having mentioned the decease of Signor Carlo Pellegrini, the "Ape" of *Vanity Fair*, who died on January 22 last, and also that of Mr. Jas. Swinton, an artist little known by the rising generation, who lately died at the age of 68, the report stated that in September last Mr. Arthur Willmore died, aged 74, "one of the last and best of our line engravers, and who with his elder brother, J. T. Willmore, produced many fine plates for the Art Union." "Last year Mr. R. Redgrave, R.A., was called away after a short illness. He was born in 1804, and in his early youth he was employed under his father, William Redgrave. At the age of twenty-one he entered the Royal Academy as a student, and supported himself by giving instruction in landscape drawing. In 1836 he exhibited at the British Institution his first well-known work, 'Gulliver on the Farmer's Table.' In 1838 an illustration of one of Crabbe's poems from his hand was hung on the line at the Royal Academy, and from that time his success was assured. In 1851 he was elected R.A., and about that time he assisted Mr. Cole (afterwards Sir Henry Cole, K.C.B.) in forming the Museum of Ornamental Art at Marlborough House, the nucleus of the present museum at South Kensington. In 1855 he was associated with Mr. Cole in representing Great Britain at the Paris Universal Exhibition, and for his services in this connexion he was awarded the Cross of the Legion of Honour. In 1858 he was appointed Surveyor of Crown Pictures, and for many years was engaged in preparing a catalogue of all pictures belonging to the Crown. He continued to send pictures to the Academy till the year 1878. His long connexion with the South Kensington Museum and with the Schools of Art throughout the country made him known to a wide circle of friends who will all feel his loss—and it is in reference to his services in this respect that he will be most fully estimated." The report continued:—

"The Report of the Science and Art Departments lately published testifies to a vast amount of activity and labour. In 1835, when the inquiry into the best means of extending a knowledge of the arts and principles of design among the people was first started in Parliament, the warmest friends of the movement could not have anticipated the dimensions which it has now attained. The whole country is covered with an elaborate network of schools and arrangements for lectures and examinations, and through this agency nearly a million persons receive some form of art instruction. Round the ordinary machinery for the preparation of a knowledge of arts and sciences are grouped various local or special institutions confining to the same objects. At the centre of the organisation stands the South Kensington Museum, with its branch at Richmond-green. Beginning with a collection of casts at a cost of £1,300, it has risen to be the owner of a collection valued at a million sterling, but absolutely priceless. For its kind and purposes no state

in the world can boast so exquisite an assortment of artistic treasures.

The public is undoubtedly inquisitive as to the relation between the zeal with which advantage is indisputably taken of the educational advantages provided for the British people, and any improvement in its sense of scientific and artistic truths. In all education the important point is the proportion which the assimilated particles bear to the crude mass. Are the scientific institution and the artistic taste of the nation keeping pace in growth with the expansion of the educational machinery? If there be radical deficiencies, are they of a nature to be corrected by alterations in the working gear? That the appetite of Englishmen for the reception of scientific and artistic ideas has been wonderfully stimulated since the influence of South Kensington made itself felt is allowed. It is not so obvious that the direction of the impulse has been on an equality of merit with the vehemence and extent of the movement. In British art, at all events, the increase of volume is sometimes more conspicuous than the elevation of aim. The awakened instinct of the people still remains greatly incapable of distinguishing between the genuine and the false. At present the public judges boldly, and gives chapter and verse in defence of its views, which as often as not are essentially erroneous as before. The Department is certain to be in possession of abundance of evidences of the success or failure of the educational influences which control or supervise it.

As the practical outcome of our efforts in art-education, we may quote the words of Mr. Swire Smith, one of the Royal Commission on Technical Education. He said that although the Science and Art Department had its defects, yet it was marvellous what it had produced in many towns; for instance, in Birmingham twenty-five years ago there were no English designers and no superior English workmen in any of the great works. Messrs. Elkington employed twenty-five foreigners, and in many other works they had foreign workmen in all the leading positions. At the time, however, when the Commission visited Birmingham, such had been the influence of the School of Art that English talent had almost superseded foreign designers and workmen. In 1878, at the International Exhibition in Paris, English glass and English enamels were admitted to be among the best, if not the best, of existing artistic works of their kind in Europe."

The report then went on to give a review of the first annual Congress of the National Association for the Advancement of Art, held at Liverpool last winter; and it concluded by announcing that for next year's presentation work the Council have provided a set of eight etchings, by Messrs. Burgess, Holloway, Morris, Ridley, Robertson, and Slocumbe.

On the motion of the Chairman, seconded by The Chisholm, the report was adopted, as were also votes of thanks to the hon. sec. (Mr. Zouch Troughton) for his services, and to Messrs. Gatti for the use of the theatre.

The drawing for prizes then took place, the first prize, entitling the holder to select a work of art of the value of 100*l.*, falling to a subscriber (A. Albanesi) at Malta.

[We congratulate the Art Union on having turned their attention towards etchings as presentations, a class of work far more artistic in spirit, and better calculated to cultivate the artistic taste of the recipients, than the large and rather coarse engravings which used to form the staple of the presentations.]

#### THE LONDON COUNTY COUNCIL.

The London County Council met on Tuesday last at Guildhall, Lord Rosebery in the chair.

**The Money Bill.**—The Finance Committee presented a report in which they said that they had considered the Money Bill for 1889. That, as the Council would be aware, was a Bill promoted annually to obtain Parliamentary power to raise the money likely to be required in the ensuing year, for capital purposes in carrying out the various works under their own charge, for contributions towards local improvements, and for loans to other public bodies in the administrative County of London. The total amount of borrowing-power proposed to be taken for works was 1,737,850*l.*, of which 1,043,863*l.* was a re-grant, leaving 693,987*l.* as the amount of new grant. The amount for which borrowing-power was proposed to be taken for loans to public bodies was 1,560,000*l.*, of which 681,500*l.* was a re-grant, leaving 878,500*l.* as the amount of new grant, and the total of the new borrowing-power under the Bill, 1,572,487*l.* The Bill also proposed to remove the limitation of one halfpenny in the pound placed on the amount authorised to be raised for the maintenance of the Fire Brigade, and also to remove doubts as to the power of the Vestries and District Boards to borrow and the Council to lend for the purpose of erecting mortuaries. The Committee having carefully considered and approved of the provisions of the Bill, recommended:—

"That the Money Bill be referred to the Parliamentary Committee."

This was agreed to.

**Salary for the Deputy-Chairman.**—The Standing Committee presented the following report:—

"1.—Your Committee have to report that they have had under consideration the question of the organisation of the staff of the Council, and, in submitting this report, the first observation they have to make is that their recommendations must be to some extent tentative in their nature.

They have had under their careful consideration the question of who should be the responsible chief salaried officer of the Council and the head of its staff. They are not prepared to recommend the appointment of a permanent official for this purpose. They are led to this conclusion mainly by these two considerations: first, that the appointment of a permanent official would largely put it out of the power of the Council to effect any such re-organisation of the staff as further experience may suggest; and, secondly, that a member of the Council would perform with greater ease and efficiency the duties heretofore specified, and especially the very important class of duties falling under head c, than could possibly be the case with an official not being a member of the Council. The duties for which they wish to make provision are the following:—

(a) To take the place and perform the duties (whether at meetings of the Council or its Committees) of the Chairman and Vice-Chairman, whenever either is absent or unable to act.

(b) To be responsible to the Council for the supervision of the permanent staff, for the general control of the heads of departments, and for the general superintendence of business.

(c) To be readily accessible to, and in regular communication with, and members of the Chairmen of the different Committees, and the heads of the various departments, and to afford them information and assistance concerning the course and conduct of business.

(d) To abstain from practising or carrying on any business or profession.

Your Committee consider that these functions should be attached to the office of Deputy-Chairman. They are further of opinion that the legal knowledge and mastery of the various Acts regulating metropolitan administration of the present Deputy-Chairman would make his services of peculiar value in this office. They therefore recommend:—

"That, in consideration of his undertaking them, he should receive a salary at the rate of 3,000*l.* a year."

The adoption of this report was moved by Sir John Lubbock, and seconded by Mr. Boulton.

Colonel Rotton moved the following amendment:—

"That it will be more fitting with the dignity of the Council and the position of the Deputy-Chairman, that the office shall be unpaid, and that the executive duties of the Council shall continue to be discharged by a head clerk to be appointed for the purpose."

This was seconded by Mr. Foster, and, after a long discussion, the amendment was negatived by 79 (against) to 29 (for). On the Committee's recommendation being put as a substantive motion, Mr. Burns moved an amendment to the effect that the amount of the salary of the Deputy-Chairman be 1,500*l.* In the course of the discussion which followed, Sir John Lubbock intimated that Mr. Firth had asked him to state that, so far as the amount of the salary was concerned, he was willing to leave himself in the hands of the Council. Mr. Antrobus, however, Mr. Augustus Harris, and other members, said that the salary ought not to be less than 2,000*l.*, and, on being put, Mr. Burns's amendment was lost by 60 against 41. The recommendation of the Committee was then adopted by 63 votes to 33.

Mr. Cohen moved that a rider be added to the effect that Mr. Firth be called upon to resign his seat in Parliament. This was lost, without a division, by a large majority.

Mr. Firth, M.P., the Deputy-Chairman, briefly returned thanks.

So much time having been absorbed by the foregoing business, the Chairman moved that at its rising the Council should adjourn until Friday, May 10, at three o'clock. This was agreed to. The first business to be taken at this supplemental meeting will be the further consideration of the Report of the Council Chamber and Offices Committee, which has stood adjourned since the meeting of the Council on April 9. [The substance of the Committee's report, and the text of the "minority report," were printed in the *Builder* for April 13, p. 285.]

#### THE CATASTROPHE AT SEVILLE CATHEDRAL.

SIR,—I have just returned from Spain, and by the courtesy of Signor Adolfo Casanova, the architectural director of the works, I have had an excellent opportunity of examining the cathedral at Seville.

The cause of the accident has been imperfect construction of the heating of the piers, and in sundry cases the external ashlar work is of a weak stone, ill-suited to carry any weight. A plan of the church is given in Fergusson's "Handbook of Architecture." The scale on which Seville Cathedral is laid out is immense, the nave and transepts being about 50 ft. wide, the side aisles nearly 40 ft. These aisles are both of the same height, not far short of 100 ft. to the crown of

"The Committee, in a footnote, state that they are informed that the salaries of the Town Clerks in our principal provincial towns range from 3,600*l.* in Glasgow to 1,600*l.* in Leeds, Bradford, and Newcastle.



the vault. The vault of the nave springs from immediately above the level of the crown of the aisle vault. The whole roof of the church, consequently, stands on a system of great clustered piers of the same height.

At the crossing the vault is raised some 25 ft. above the adjoining vault. This is called in Spain the *cimborio*, and is, in one form or another, a very general feature.

The church was begun in 1403, and was about 100 years in progress. In 1511 the *cimborio* fell down. The *cimborio* which fell stood very much higher above the roof than that which was almost immediately erected in its place. It must have been more like a central tower. The second *cimborio* is lighted by windows in the vertical walls, opening upon the outside of the vaults of the nave and transept. These vaults are the only roof of the church. There is no external roof above them, as would be required in a northern country.

The Chapter records show that the condition of the building had been a subject for anxiety on many occasions, and from the time of the fall of the *cimborio*, numberless reports were sent in as to repairs, &c. The building had also been shaken by sundry earthquakes.

The state of things had recently become so alarming that the building was placed in charge of the Government architect, and works were taken in hand to strengthen, repair, and, where thought necessary, to rebuild some of the great columns. Cross shores and struts were erected in all directions, and some columns were jacketed in timber.

It is possible that the building may have been somewhat shaken by the removal of the pillar in the south transept, next to that which has now fallen. On Aug. 1 last the south-west pillar, supporting the *cimborio*, fell with a crash. One photograph, which I enclose, taken from the floor of the south transept, and looking north-east, shows the great springer fallen in one huge piece.

The other photograph, taken from the scaffold in the north transept, and looking south-west, shows a part of the arch of the great arcade still standing; the rest of the arch, with the superincumbent wall and clearstory, having crumbled through the southern organ.

The choir stalls, superlunary works of the fifteenth century, have suffered at this point; but it is remarkable that so terrible an accident should have happened in the very centre of the building, with many workmen in it at the time, and no lives lost, or, except the stalls, much damage done to the works of art, of which the church is full.

Eleven pillars, in all, are to be rebuilt, and it is to be hoped that the very difficult and necessary work may be speedily and successfully carried through. In a country subject, from time to time, to earthquakes, more or less severe, no half measures can be adopted. The pillar that has been reconstructed is a splendid piece of work, and until the shabby pillars are as firmly re-established, the church cannot be considered secure.

It seems to be a most genuine work of restoration,—using that much-abused word in its true sense.

SOMERS CLARKE.

15, Dean's-yard, S.W., May 4, 1889.

# WHITE PAINTS.

SIR,—In the *Builder* for April 27 [p. 309], an interesting article by Mr. H. C. Standage appeared, under the heading of "Some Special White Paints."

After referring to the extremely injurious effects on painters of ordinary white lead, the writer mentioned Freeman's Non-Poisonous White Lead.

I have been requested by Messrs. Freeman to correct some inaccuracies which, I passed over, might have a tendency to injure the reputation of this new pigment, and to ask you to oblige them by inserting this letter in your next issue.

In the first place it is worthy of note that the mere addition of oxide of zinc to sulphate of lead does not make a white pigment of any value, but that the density of the non-poisonous white lead is the special treatment set out in the specification of the patent. The following figures show this clearly:

Sulphate of lead: 1 cubic foot weighs 168 lbs.  
Oxide of zinc: 1 cubic foot weighs 58 lbs.  
Mixture of three parts of sulphate of lead and one part of oxide of zinc: 1 cubic foot weighs 129 lbs.  
Mixture of three parts sulphate of lead and one part oxide of zinc, made into Freeman's white lead: 1 cubic foot weighs 200 lbs.

Ordinary white lead averages about 160 lbs., and special quality white lead about 184 lbs. to the cubic foot.

According to the experiments Mr. Standage refers to, Freeman's white lead appears to require more oil to make it sufficiently thin than Griffith's White. Numerous experiments having been made here to test this point with the non-poisonous white lead in comparison with every white paint in the market, I am in a position to say that, so far from this being true, the reverse is the case. It is not necessary to quote results arrived at in these works, as a report is to hand of an examination made quite independently for a large buyer by a man of considerable experience:—

|                             | Freeman's<br>White Lead Paint. | Ordinary<br>White Lead<br>Paint. |
|-----------------------------|--------------------------------|----------------------------------|
| Paint 2 oz. ....            | 2 oz.                          | 2 oz.                            |
| Driers 4 oz. ....           | 4 oz.                          | 4 oz.                            |
| Oil and Turpentine 10½ drs. | 5 drs.                         | 9 drs.                           |

In this test the covering power of Freeman's white lead was found to be equal to best white lead.

As to the effect of various acids on the different white paints, any one reading Mr. Standage's article would suppose that the non-poisonous white lead is very easily acted upon by acids; whereas sulphate of lead, of which it is principally composed, is scarcely affected by them.

Ordinary white lead is readily affected by acids, but, notwithstanding, is a most durable paint.

Further, considering that white paint dries in about twenty-four hours, dropping concentrated acids on to paint in the wet state can give no indication of the slightest practical value as to the effect of minute traces of acid in a most diluted condition on white paint when the oil has had time to dry.

HENRY SEWARD, F.C.S.,

Chemist at Messrs. Freeman's Works.

Battersea, May 1.

## The Student's Column.

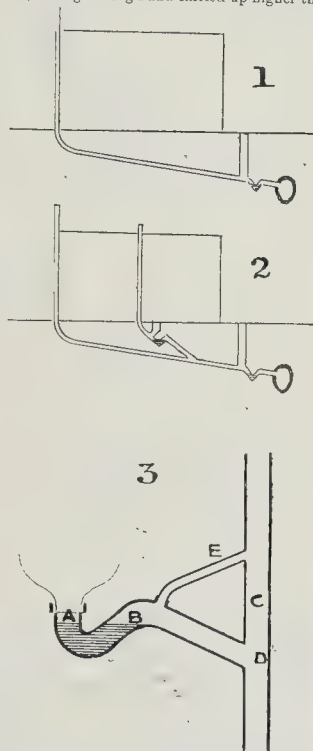
### TOWN DRAINAGE.

#### XIX.—SOIL-PIPES (continued).

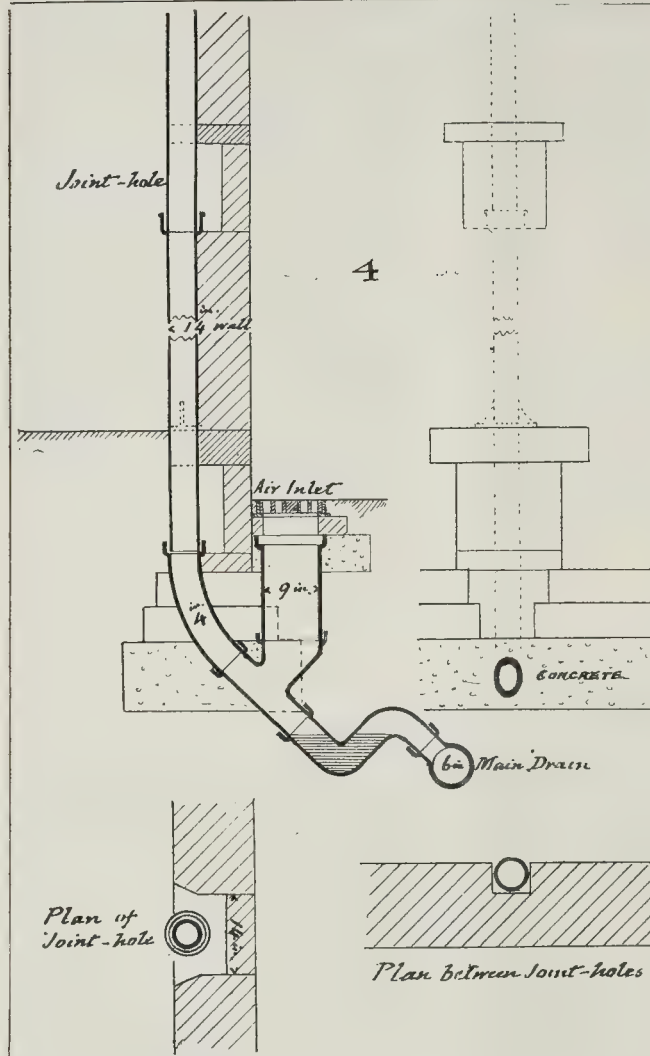
THE air-course for the ventilation of a house-drain proceeds from its inlet at or near the ground level to its outlet by a vertical pipe erected at the far end of the drain, this pipe being in some cases the soil-pipe of a water-closet and in others a special pipe erected for the purpose, where upper water-closets are not situated at the far end of the drain,—as, indeed, they should not be, but sometimes are, in which case the soil-pipe is made use of for the ventilation of the whole drain. In this case the vertical soil-pipe is directly connected with the drain, a bend pipe being turned up to receive the foot of the soil-pipe, as in fig. 1; but when a special pipe is erected at the far end for the ventilation of the drain, and the water-closets are situated lower down, the soil-pipe is trapped at its foot, as in fig. 2. In laying the main portion of the drain a junction-pipe is inserted to receive this branch, which must enter the drain obliquely; care, therefore, must be taken not to over-run the true position of the junction-pipe, so that the branch may be laid from it at the angle required for making the ends of the pipes fit closely all round, one of the straight pipes being cut to the length required after the junction-pipe, the trap, and the air inlet-pipe have been laid, and the exact length of the branch can be ascertained, after which a bend is turned up to receive the foot of the soil-pipe. This does not rest upon the top of the bend, but is independently supported; and where a drain is laid to an already existing soil-pipe there must be height enough between the lowest support and the top of the bend to enable the joint to be made.

If the vertical pipe is of lead it will be supported on wood blocks, built into the wall, every 6 ft. or so in height, or as the plumber may require. A lead soil-pipe 4 in. internal diameter should be ½ in. thick, weighing a little more than 8 lbs. per lineal foot, and in exposed situations this is hardly a sufficient thickness, especially if the pipe be more than 4 in. diameter. Lead is the most convenient material for this purpose, but when a sufficiently large diameter is required it becomes expensive, and this has often caused its diameter to be made too small; and when, partly on this account, siphonage has taken place in water-closet traps, in the manner referred to in the last article, it has been attempted to prevent it by connecting the crown of the trap with the vertical soil-pipe by means of a short branch E in fig. 3. When the trap and soil-pipe are of lead this is easily done, if the connecting-pipe be carried up only a

short distance above the floor, and consequently not very high above the mouth of the discharge pipe D; but the success of the attempt to prevent siphonage by this means depends upon this height. If the attenuated air in the soil-pipe C behind the falling water did not extend above the point where the branch is connected, —say 18 in. or 2 ft. above the mouth of the pipe D,—then the air passing down the pipe from the atmosphere, after each discharge, would act upon the surface of the water in the trap at B and balance the pressure of the atmosphere at A, and siphonage would be prevented. But, although it is easy to make this connexion at a height not much above the level of the trap, it is by no means easy to make it at a sufficient height to be effective, unless it be done in the first instance. When all other things have been fixed it is difficult,—and in some cases impossible,—to carry the connecting-pipe high enough up the soil-pipe, and the result has not always been that which was desired. A much better plan is to make the vertical pipe large enough to bring down the air from above the house with sufficient ease to follow the discharge of the water-flush closely, in which case no such connecting-pipe is necessary for the purpose of preventing siphonage: it has, however, another use, if large enough and carried up higher than



is shown in fig. 3, that, namely, of relieving the water surface B of the excessive pressure produced immediately below or in front of the descending water when the soil-pipe is so small that the water-flush fills it and forms a sort of plug, driving the air before it. This, however, cannot happen when the soil-pipe is large enough to let the air pass upwards while the water is descending. Its first effort is to do so, when compressed, and it only needs room enough to pass upwards and equalise the pressure behind the falling water; but, as this could not be wholly effected, whatever the size of pipe, it is necessary to supplement the deficiency by allowing the air to follow the water downwards easily, and nothing but a sufficiently large pipe can do this. Four inches may be a sufficient diameter if the height be not great, but if more than two storeys the size should be 4½ in. or 5 in. Plumbers do what they can to remedy the defect of a too small main pipe, and one plan is to carry up from the foot, or near the foot, of the soil-pipe a 2-in. or 2½-in. air-pipe, continuing this upwards, beyond the highest



branch, and, if inside the house, turning it through the wall to the open air above the highest window, enlarging the mouth of the pipe. In that case they connect the branch-pipe E with this air-pipe, instead of with the soil-pipe.

If the soil-pipe be of cast-iron it should be 3 in. thick, and the joint space within the socket 3 in. all round. The weight of a 4-in. pipe is 17 lbs. per lineal foot, including the sockets. The lengths of pipe may be 9 ft., but special lengths to which branches are attached should be short. With iron pipes the branches are cast on with the body of the pipe, and these special lengths should be about 3 ft. The bottom length should be a flange-and-socket pipe, the flange near the lower end being bedded on hair-felt upon a stone laid across the lowermost joint-hole, as in the figure 4. The succeeding lengths of pipe are spigot-and-socket pipes to near the top, the last length through the roof being plain at both ends. The sockets should not be less than 3 in. deep, tightly caulked nearly full with tarred spun-yarn, and stopped with mastic. The air-tightness, however, depends upon the caulking, whether in these vertical pipes or in the horizontal pipes of the drain, and not upon the stopping in either case, which is only put in as a protection to the real jointing material. Lead may be run in, after the joint has been caulked to half its depth, if there is room at the back of

the pipe for "setting up" the lead with a 23-lb. hammer, and if the socket is strong enough to withstand the strain of setting up. This will be so if ordinary pipes cast for the use of water or gas works be used, which are purposely made with a strong rim; but the sockets of these ordinary pipes are ugly things when set up for the purpose of soil-pipes or air-pipes, and the sockets should be specially designed, not so thick and clumsy. If the joints be not caulked at all, they may be made with iron borings, or filings if clean, and sal-ammoniac, with flour of sulphur, mixed with water in small quantities, and used immediately. The soil-pipe, and its continuation upwards as an air-pipe, should not have any abrupt bend, whether of iron or lead, but a slight bend, or even two, in the air-pipe is of no great importance; in some situations, indeed, it cannot be avoided. When it is necessary to cut off a piece of the spigot-end of a cast-iron pipe, to suit the height of floors, this is easily done with a steel chisel, the point of which is diamond-shaped.

With iron pipes it is very necessary to protect them from rust *inside*, and no paint or varnish applied when the pipe is cold will last any long time. It can only be done when the pipe is hot, and is best done at the foundry, after the pipes have been cleaned, and before exposure to the air. The coating which has been found to answer best is melted coal-tar pitch, into

which the pipes are dipped while at a temperature of about 300 deg. Fahr., being that of a dull red heat;—the process of the late Dr. Angus Smith, and called by his name.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

5,808, Artificial Stone. A. C. Ponton and others.

The product resulting from this process or method of manufacture, and which is the subject of this patent, is claimed to be of a superior character, combining great strength with durability. The process is based upon a chemical change which takes place when certain silicious substances are mixed and burned in exact proportions. All kinds of tiled or glazed ware may be made by the method, and either fine work with a surface as smooth as glass or coarse concrete blocks suitable for submarine work can be produced.

7915, Portland Cement. A. Fleiner.

According to this invention, a form is given to the bodies of the raw material such as will prevent "sintering" or baking together during the process of burning. The cement may be burned in ordinary pit-shafts or kilns.

8,040, Wash-out Basins. B. Robinson.

The improvement which is the subject of this patent consists chiefly in the construction of a basin with a hollow rim, which rim constitutes or takes the place of an after-service box, and provides a double flush. The fan or spreader has side wings, through which the water escapes so as to flow round the basin as usual, and has also a downward extension, at the bottom of which are small apertures for the flow of the after-supply from the rim.

8,270, Ventilators. C. Ellis.

According to this invention, ventilators formed with vanes or louvres may be opened, closed, and put in or out of operation easily, as desired. The action of the apparatus is managed by a telescopic screw, which, being actuated, forces the sections apart, and when it is desired to close the ventilator, the sections are drawn together, and are then wind- and weather tight.

8,727, Sharpening Plane-Irons. W. E. Plested.

According to this invention, a small roller, of cutting material, or metal supplied with emery, &c., is fixed in a cast-iron stand, in which also is fixed a notch or recess for holding the plane or chisel while being sharpened. It is claimed that the appliance will enable one who has had no experience to do what has hitherto required much skill and practice to perform.

3,893, Sand-faced Bricks. W. Johnson.

By this invention, machinery for producing the bricks is designed to act continuously, and to sand- or roughen the face of the bricks automatically, thereby preventing frequent stoppage of the machinery for this purpose, and greatly increasing the output.

##### NEW APPLICATIONS FOR PATENTS.

April 23.—6,819, J. Jacquemin and E. Segrestan, Closing Orifices in Drain-pipes, &c.—6,822, S. Frederick, Metallic Roofing.

April 24.—6,860, J. Tall, Hinges for Ledge-doors.—6,863, R. Sharp, Lavatory Basin.—6,864, R. Sharp, Combined Waste and After-flush to Lavatory Basins.—6,874, J. Tata and J. Lyons, Mosaics.

April 25.—6,898, W. Barwell, Draught, Rain, and Dust Excluders for Doors.—6,915, G. Ewart and others, Metal Roofing.—6,930, A. Dias, Metal Dowel or Tenon for Door-frances, &c.—6,949, J. Middlehurst, Flushing Apparatus for Water-closets.

April 26.—6,953, J. Martindale, Ventilating and Chimney Cows.—6,964, R. Watson, Window-fastener and Guide.—6,966, J. Bone and W. Wilton, Fastener for Window-sashes and Casements.—6,966, W. Thompson, Combined Sewer-gas Excluder, Trap, and Sink.—7,001, B. Mitchell, juu., Retaining Doors in any position when open.

April 27.—7,020, H. Kimpton, Tip-over Flushing Tank.—7,040, D. Davies, Window-catch.—7,056, J. Preston, Window-lock.—7,051, A. Washington, Paint.

##### PROVISIONAL SPECIFICATIONS ACCEPTED.

3,376, J. Becker and W. Wines, Cleaning, Whitewashing, and Painting Ceilings.—3,376, B. Finch, Stove.—4,016, W. Bakewell, Drip-dry Covering for Roofs.—4,084, L. Fraser and others, Set Squares.—4,393, F. Greenstreet and J. Lens, Sustaining Sashes.—4,436, W. Frideaux, Window fasteners, &c.—4,434, A. Morrison, Fittings for Door Knobs and Spindles.—4,646, W. Dunn, Fire grates.—4,896, J. Gobel, Brick Ovens.—5,120, A. Reid, Wood Screws.—5,255, W. Howlett, Fastening for Doors.—5,342, A. Haghe, Raising Long Ladders.—5,373, H. Lewis, Door Springs and Checks.—5,384, W. Heathman, Band-saw Machines.—5,742, J. Willing, Fixing Letters and Devices to Facias &c.—5,826, R. Robinson, Joint for Sanitary Pipes.—5,835, J. Shanks, Flushing Apparatus of Water-closets.—5,875, A. Clark, Leak-detectors for Pipes.—5,876, J. Carmichael and W. Whitman, Sea-proof Scaffold Staging.—5,929, W. Jennings, Nails.—6,123, W. Ramsbottom, Flushing the Basin of Water-closets.



COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,697, A. Morrison and M. Ingram, Bath and Lavatory Fittings.—9,317, R. Stephens, Fastenings for Basement Windows.—14,073, R. Hyde, Raising and Sliding Windows.—4,855, G. Connell, Flue Ventilators.—5,074, F. Fry, Window-sash Fastener.—5,141, W. Devoll, Syphons for Flushing Water-closets.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 17.—By W. BROWN & CO. (at Tring).  
Living, Park-rd.—Four f. houses, r. 264 p.a.  
Two similar houses; and 3, 4, and 5, Albert-st.,  
f. r. 275 p.a.  
By WYATT & SON (at Chichester).  
Chichester—14 and 15, Westgate, f. r. 225 p.a.  
APRIL 18.—By WYATT & SON (at Chichester).  
Portfield—A detached f. house.  
Florence-lane—Three cottages f.  
APRIL 22.—By W. BROWN & CO. (at Tring).  
Tring—Thirteen f. houses, r. 2103, 12s. 4d. p.a.  
By G. A. WILKINSON.  
Hunbury—F. g. r. of 48 a. p. with reversion in  
21 yrs. to s. of 230  
Kennington—182, Kennington Park-rd., c. r.  
250 p.a.  
22, Stannary-rd., u. 39 yrs., g. r. 26  
Blackfriars—46, Stamford-st., f. r. 270 p.a.  
Banstead—F. g. r. of 47, reversion in 38 yrs.  
By T. WOODS.  
Eleventh—"Heston Lodge," with grounds, f., c. r.  
2120 p.a.  
By T. MAX & CO.  
Anerley, Croydon-rd.—"Brunswick Villa," u. 76  
76 yrs., g. r. 212, 10s.  
By EYES & SON.  
Bromley-by-Bow—F. g. r. of 216, with reversion in  
60 yrs. to 2117 p.a.  
City-rd.—103, East-rd., u. 58 yrs., g. r. 212, 10s.  
r. 235 p.a.  
Canterbury—82, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000.  
By H. HOOPER.  
Canterbury—3, Edith-rd., u. 39 yrs., g. r. 26,  
r. 255 p.a.  
APRIL 30.—By P. D. TUCKER.  
Canterbury—An ag. r. of 288, 13s. 9d., u. 15 yrs.  
By W. HOLCOMBE.  
St. James's—The house of 16, Dury-st., u. 26 yrs.,  
r. 2200 p.a.  
Aylestone—97 and 99, Lion-on-grove, u. 26 yrs.,  
r. 218, r. 212 p.a.  
7, Earl-st., u. 23 yrs., g. r. 228 p.a.  
6 and 8, Eider-st., u. 29 yrs., g. r. 221, 6s. r.  
270 p.a.  
9, North-st., u. 39 yrs., g. r. 27, 17s. r. 245 p.a.  
1, Faversham-rd., Canaburgh-st., 34 yrs., g. r.  
226, and 35, Clarence-gdns., same term, g. r. 216,  
r. together 25 p.a.  
By DEBENHAM, TAYSON, & CO.  
Aylestone—61, Aylestone Lodge, and 2a, St. Sp. f.,  
underbell—70 and 72, Denmark-st., f. r. 232, 10s.  
p.a.  
Aylestone—86, Portadown-rd., u. 61 yrs., g. r. 220,  
r. 270 p.a.  
By W. E. P. DOUGLASS.  
Aylestone—Castle House, and 2a, St. Sp. f.,  
Aylestone—28 to 46, (even), Chapel-st., f. r. 216, 8s.  
p.a.  
By THURGOOD & MARTIN.  
Aylestone—9, Mowbray-rd., u. 30 yrs., g. r. 215,  
r. 250 p.a.  
Aylestone—6, Queen Anne-ter., u. 59 yrs., g. r. 210,  
r. 240 p.a.  
By R. J. COLLIER.  
Aylestone Hill—The f. residence, "Highfield,"  
and 3a, St. Sp. f.,  
Aylestone Hill, Ambrose-rd.—"Gasmere," u. 76  
76 yrs., g. r. 216, c. r. 2120  
By E. G. SIM.  
Aylestone—3a and 4a, Manchester-st., u. 76  
76 yrs., g. r. 212, 12s. c. r. 267, 12s.  
Aylestone—2, Beaumont-rd., u. 92 yrs., g. r.  
26, 10s., c. r. 216, 10s., s. sold after auction  
Aylestone—35, Devonshire-rd., u. 50 yrs., g. r. 212,  
c. r. 216, 10s.  
By W. BROWN & CO. (at Marworth).  
Marworth, Bucks.—A residence with five cottages  
and orchard and meadow land f.  
May 1.—By BAZED & SON.  
Aylestone-grove—No. 69, u. 12 yrs., r. 2250  
p.a.  
Aylestone-grove, u. 12 yrs., r. 2270 p.a.  
Aylestone, Kennington-rd., u. 13 yrs., r. 2170  
p.a.  
By F. J. BIRLEY.  
Aylestone—15, 16, and 17, Westlake-rd.,  
u. 39 yrs., g. r. 212, 10s., r. 272, 10s. p.a.  
Aylestone—156, Green Lane, u. 31 yrs., g. r. 216,  
r. 270 p.a.  
By J. G. & A. PAVERT.  
Aylestone—4, Leslie-ter., u. 40 yrs., g. r. 23, 10s.,  
r. 220 p.a.  
Aylestone—24 to 26, (even), Grove-st., u. 124  
yrs., g. r. 216, 10s.  
Aylestone—22, Malmesbury-rd., u. 68 yrs., g. r. 24, r.  
228 p.a.  
Aylestone—326, Oxford-st., f. r. 240, 8s. p.a.  
Aylestone—19, White Horse-lane, f. r. 244, 4s. p.a.  
Aylestone—The residence, "Hill Brow," u. 30  
yrs., g. r. 212, 10s., r. 248 p.a.  
Aylestone—17, 19, and 21, Ricardo-st., u. 39 yrs., g. r.  
24, r. 248, 8s. p.a.  
Aylestone—21, Albert-rd., u. 71 yrs., g. r. 23, c. r.  
220 p.a.

By BROAD & WILTSKIRE.  
Ore, near Hastings—Twelve plots of f. land ..... 2,170  
May 2.—By WORSWOLD & HAYWARD.  
Dover—3 and 9, Union-rd., f., r. 229 p.a. .... 455  
38, Military-rd., f., r. 216 p.a. .... 280  
10, Belbarn-ter., f., r. 219 p.a. .... 280  
84, Lincolin-st., u. 38 yrs., g. r. 26, 10s. .... 180  
Charlton—41, Tower Hamlets-rd., f., r. 210 p.a. .... 130  
By G. B. BURY.  
Waltham—5, 7, and 9, King and Queen-st., u. 68  
88 yrs., g. r. 210, 10s., r. 258, 10s. p.a. .... 360  
31 to 37 (odd), Aylebury-st., u. 24 yrs., g. r.  
213, r. 212, 8s. p.a. .... 540  
13 to 33 (odd), Webster-st., u. 57 yrs., g. r.  
216, 10s., r. 237, 10s. p.a. .... 3,085  
By FARRINGTON, ELLIS, & CO.  
Gowell-rd.—"The Shakespeare" p.a., r. 259  
p.a. f. .... 2,100  
By E. HOLSWORTH.  
Forest Gate—9, Odessa-rd., f., r. 229 p.a. .... 300  
By NEWSON & HARDING.  
Finsbury Pk.—16 to 22 (even), Victoria-rd., u. 75  
yrs., g. r. 224, r. 2128  
Hackney—70, Well-st., u. 43 yrs., g. r. 25, c. r.  
245 p.a. .... 1,000  
Stoke Newington—31 and 33, Milton-rd., u. 68  
yrs., g. r. 25, 4s., c. r. 251 p.a. .... 465  
Holloway—28, Lorraine-rd., f., r. 248 p.a. .... 605  
1, 2, and 10, Lorraine Cottages, f., r. 258, 10s. p.a.  
City-rd.—20, Westmoreland-st., f., r. 232, 10s. p.a.  
Punney Bridge-rd.—"Park Lodge," u. 69 yrs.,  
g. r. 221, c. r. 2100 p.a. .... 610  
Somers Town—g. r. of 2109, held for 62 yrs. .... 320  
By E. EVANS.  
Wandsworth, Burntwood-lane—Four residences, u. 91  
91 yrs., g. r. 224, r. 2123, 8s. p.a. .... 905  
Battersea—33 and 35, Edin-rd., u. 38 yrs., g. r. 25,  
r. 270, 4s. p.a. .... 540  
May 3.—By TOWERS, WILLIAMSON, & ELLIS.  
Bayswater—144, Inverness-ter., u. 52 yrs., g. r.  
212, r. 235 p.a. .... 1,210  
By DODD & PEARCE.  
Hampstead—95, Adelaide-rd., u. 56 yrs., g. r. 215,  
with possession ..... 750  
By BAKER & SONS.  
Westminster—The letting for a term of 80 yrs. of  
land containing an area of 24,270 ft. in York-  
st. and Palmer-st., at 25, 150 p.a., before the  
auction.  
The 2,751 ft. in Palmer-st., let for same term at  
2100 p.a. also before the auction.  
By HERRING, SOX, & DAV.  
Brixton-hill—6, Gilbert-villas, u. 59 yrs., g. r.  
213, 10s., c. r. 2140 p.a. .... 1,000  
[Contractions used in this list.—F. g. r. for freehold  
ground-rent; l. g. r. for leasehold ground-rent; i. g. r. for  
improved ground-rent; g. r. for ground-rent; r. for rent;  
f. for freehold; c. for copyhold; l. for leasehold; c. r.  
for estimated rental; u. for unexpired term; p. a. for  
per annum; yrs. for years; st. for street; rd. for road;  
sq. for square; pl. for place; ter. for terrace; yd. for  
yard, &c.]

MEETINGS.

SATURDAY, MAY 11.

Architectural Association.—Visit to the Imperial  
Institute. 3 p.m.  
Association of Public Sanitary Inspectors.—Major  
Greenwood, jun., M.D., on "The Great Plague of  
London, with special reference to the Sanitary state of  
the Metropolis in 1665 and 1889." 6 p.m.  
MONDAY, MAY 13.  
Society of Arts (Lecture).—Mr. H. Graham  
Harris, on "Heat Engines other than Steam." 11. 8 p.m.  
Liverpool Architectural Society.—Mr. J. Starkie  
Gardner on "Early English Ironwork." 7 p.m.  
TUESDAY, MAY 14.  
Society of Arts (Applied Art Section).—Dr. Salvati  
on "Venetian Glass." 8 p.m.  
Royal Institution.—Dr. Jean Paul Richter on "The  
Italian Renaissance Painters." 11. 3 p.m.  
Institution of Civil Engineers.—Further discussion on  
Mr. W. H. Greenwood's paper on "The Treatment of  
Steel by Hydraulic Pressure, and the Plant employed  
for the purpose." 8 p.m.  
WEDNESDAY, MAY 15.  
Regal Meteorological Society.—(1) Mr. W. H. Dines,  
B.A., will give "An Account of some Experiments made  
to investigate the connexion between the Pressure and  
Velocity of the Wind." (2) Two other papers will be read.  
7 p.m.  
Builders' Foremen and Clerks of Works' Institution.—  
Ordinary Meeting. 8.30 p.m.  
British Archaeological Association.—(1) Mr. T. Morgan,  
F.R.S., on "Phases of Early Christianity." (2) The  
Rev. Scott Surtees on "Earl Godwin and his Sons." 8 p.m.  
Society of Arts.—Mr. A. F. Yarrow "The Use of Spirit  
as an Agent in Prime Movers." 8 p.m.  
THURSDAY, MAY 16.  
Sanitary Institute.—Mr. H. E. Davis on "Fires and  
Fire Escapes, and the Prevention and Arrest of Fires."  
6 p.m.  
Society of Antiquaries.—8.30 p.m.  
Edinburgh Architectural Association.—Valedictory  
Address by the President (Professor G. Baldwin Brown,  
M.A.). 8 p.m.  
FRIDAY, MAY 17.  
Architectural Association.—(1) Mr. D. J. Blow on "The  
Travelling Students' Notes." (2) Election of Officers for  
ensuing session. 7.30 p.m.  
SATURDAY, MAY 18.  
Edinburgh Architectural Association.—Visit to Ariston  
House and Temple Church.

Miscellaneous.

The New Hospital for Women.—The  
foundation stone of this hospital was laid by  
H.R.H. the Princess of Wales on Tuesday,  
7th inst. The new building is being erected on  
the north side of Euston-road, near Euston-  
square. It comprises three main blocks, viz.—  
the central, for administration and private  
wards; the south or rectangular pavilion, having  
the entrance hall and a medical institute  
room on the ground floor, with two floors of  
wards above; and the north or circular pavilion,  
having the out-patient department on the  
ground-floor, and two floors of circular wards  
above. The pavilions are connected with the  
central block by covered ways, which can be  
thrown open at pleasure, so as to secure the  
most complete isolation possible for the wards.  
The towers containing the baths and closets are  
connected with the wards in a similar manner.  
Besides a large out-patient department, accom-  
modation will be provided for forty-two beds in  
two rectangular wards, 42 feet by 26 feet, for  
ten beds each, giving 109 square feet and  
1,474 cubic feet per bed, and two circular  
wards, 35 feet diameter, for nine beds  
each, giving 107 square feet, and 1,444 cubic  
feet per bed. The remainder are in private  
wards. The kitchens and nurses' rooms will be  
on the third floor. The materials employed for  
the walls are stock bricks, with red brick for  
cornices, quoins, window-dressings, &c. Inter-  
nally the walls of the out-patients' waiting-room,  
the bath-rooms, closets, &c., are lined with  
cream-coloured glazed bricks, and the floors  
will be finished in Parian cement. The wards  
throughout will be fireproof, of iron and con-  
crete, on Messrs. Homan & Rodgers's system, the  
wards being laid with oak-block flooring, and  
the corridors with cement flooring. The building  
is being carried out from the designs of Mr.  
J. M. Brydon, F.R.I.B.A. The general contract  
has been taken by Messrs. Higgs & Hill, of  
South Lambeth; the warming and ventilation  
has been entrusted to Mr. D. O. Boyd, of  
Maddox-street; and Mr. William Lawrence is  
clerk of the works. The Committee have also  
had the advice and co-operation of Miss Florence  
Nightingale and Sir Douglas Galton on sanitary  
and other arrangements.

Art-workmanship Competition, 1889.  
The judges appointed by the Council of the  
Society of Arts have awarded the following  
(among other) prizes for objects submitted in  
the above competition.—Stone Carving: First  
Prize not awarded; Second Prize (15*l.*) to W. H.  
Fry, Cheltenham, for a capital of a column,  
carved in the Early English style of architec-  
ture. Second Prize (15*l.*) to Josiah Farmer,  
Cheltenham, for an octagonal capital of  
a column, carved in fifteenth-century style  
of architecture, with thistle foliage orna-  
ment. Third Prize (10*l.*) to William Vickers,  
Camberwell, for a capital of a column,  
carved with bramble foliage and birds.  
Fourth Prize (5*l.*) to Frederick Nelson, Teign-  
mouth, South Devon, for a Sicilian marble  
capital of a column, carved with a design,  
"Common objects of the sea-shore." Wrought-  
iron work: First Prize (25*l.*) to S. C. Hobbs,  
London, for a wrought-iron grille for inside  
window-screen or glass door-panel. Second  
Prize (15*l.*) to William Hooks, London, for a  
wrought-iron grille for vestibule door. Designed  
by G. F. Henney. Third Prize (5*l.*) to Henry  
Ross, London, for a wrought-iron grille for  
street door. The whole of the work sent in for  
competition in this class is highly commended.

The Industrial and Art Exhibition at  
Bremen.—*Apogee* of the Industrial and Art  
Exhibition to be held next year at Bremen,  
which is open to foreign competitors in respect  
of steam-engines, motors, machinery, and im-  
plements for the manufacture of wood, leather, and  
metals, and to which we recently referred, we  
have to add that all applications for space  
should be addressed to the "Bureau der nord-  
westdeutsche Gewerbe und Industrie Ausstel-  
lung," in Bremen, before March 1, 1890, and the  
exhibits received before May 15, of that year.

Monument to John Ericsson.—The  
Senate of the city of New York has decided  
upon erecting a monument to the late John  
Ericsson, the famous Swedish inventor, in the  
Central Park, at a cost of 10,000 dols.

The New Government Buildings at  
Christiania.—The second competition for the  
designs for the new Government buildings at  
Christiania is now taking place, the architects  
entitled to compete having been reduced to five.

The Association of Municipal and  
Sanitary Engineers held a Home Counties  
District meeting at Southampton on Saturday  
last, but we regret that we have no space to  
devote to it this week.



**Society of Engineers.**—At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on Monday evening, May 6, Mr. Jonathan R. Baillie, President, in the chair, a paper was read by Mr. Perry F. Nursey (Past President) on "Recent Developments in High Explosives." The author first pointed out the importance of high explosives, and instanced the removal of Flood Rock at the entrance to East River, New York, in 1885, when 150 tons of nitro-glycerine compounds were simultaneously exploded. He then described the special features of various explosives, and compared their action, showing how explosion in some was intensely rapid and smashed the rock within a limited area, whilst in others the rate of explosion was more retarded, so that they rent and fissured the ground over a large area, to the manifest advantage of the miner. He then referred to the detrimental fumes evolved by the explosion of dynamite, and pointed out that these fumes were absent from some of the comparatively slower burning compounds which had time for perfect combustion. He briefly referred to some of the earlier explosives which had been described in previous papers read by him on the subject of explosives. He next pointed out that during the existence of the dynamite patent the field was closed against other nitro-glycerine compounds in this country, although on the Continent and in America they flourished. On the expiry of that patent, however, in 1881, there was everywhere renewed activity in the invention of nitro-glycerine compounds. The author then showed that there were practically over three hundred varieties of explosives of all classes, and including gunpowder, but that commercially the list of high explosives was a comparatively short one, and had reference mainly to those of more recent date. This list included Dynamite, Lithotractor, Blasting Gelatine, Gelatine Dynamite, Gelignite, Roburite, Securite, Bellite, Carbo-dynamite, Von Dahmen's Safety Dynamite, Hengst's Powder, Cotton-powder, Tonite, Potentite, and Melinite. The author explained the composition and special attributes of each of these explosives, and detailed the results of experiments and practical trials he had made with many of them, and of the practical work he had done with several of them. This latter included the bringing down of some 400 tons of rock in Jersey harbour at one blast; the demolition of a bridge in Belgium, and the chambering of the hard chalk 400 ft. down a trial boring  $\frac{3}{4}$  in. diameter, and under a 350 ft. head of water. The two former blasts were made with Lithotractor and the latter with Carbo-dynamite. The author described some heavy blasts which had been effected with gunpowder and nitro-glycerine compounds at various times, and gave the results of work done as being from 30 tons to 350 tons of rock brought down per pound of high explosive used, which agreed with the results he had himself obtained. He concluded by pointing out that the same explosive was not suitable for every kind of work, but that the present tendency of manufacturers and inventors was to so modify and regulate the explosive force of blasting compounds that they could be made generally available for any kind of ground.

**The Institute of Builders.**—At a meeting of this Institute, held on the 7th inst. at 31, Bedford-street, W.C., Mr. Frank May, J.P., presiding, Mr. Richard S. Henshaw was presented with an illuminated address, which read as follows:—

"To Richard S. Henshaw, Esq., Secretary of the Institute of Builders.

Sir,—We, the undersigned, desire to record our appreciation of the sincere and earnest manner in which you have carried out your duties in connection with the several Societies of Builders of which we are members.

We further desire to offer you our good wishes for health and happiness on the occasion of your marriage, and beg your acceptance of the accompanying clock and purse of fifty guineas as a token of our regard."

[Signed by upwards of seventy leading builders and building firms.]

**Draycott Sewerage.**—Mr. J. T. Harrison, C.E., held a Local Government Board inquiry at Draycott on the 2nd inst., to consider an application to borrow 2,700l. for sewerage and sewage disposal. Mr. W. H. Radford, C.E., of Nottingham, is the engineer for the scheme, and he explained that it was proposed to deal with the sewage by irrigation on six acres of specially prepared land. The district is very flat, and there has been great difficulty in arranging the levels of the sewers to act efficiently without pumping.

### Discovery in Stratford Parish Church.

In connexion with the removal of the organ from the north transept to the east end of the south aisle, workmen were on Saturday engaged in taking up a portion of the floor at the Church of the Holy Trinity, Stratford-on-Avon, when the Vicar (the Rev. G. Arbuthnot) caught sight of a stone slab, buried about 2 ft. below the floor level. Upon one end of the stone was a carved cross, and the Vicar at once gave orders for the whole of the stone to be uncovered. Substantial rows of brickwork had been built across the stone to support the floor, and upon these and a quantity of debris being removed, the large ancient altar-stone, 9 ft. 6 in. by 3 ft. 6 in., belonging to Thomas à Becket's Chapel, was disclosed. The front edge of the stone is beautifully polished and bevelled, and already three of the five crosses which altar-stones usually bear have been discovered. The stone is covered with incrustations of dirt through being buried in the ground. The existing south aisle, which contains the chapel, was rebuilt early in the fourteenth century,—probably about 1330,—by John de Stratford, Bishop of Winchester, afterwards Archbishop of Canterbury, a native of Stratford, who founded the chapel, which he dedicated to Thomas à Becket, and the Vicar believes the stone just discovered to be the original slab which formed the altar. It will be taken up and very carefully preserved. Near the spot, at the back of some oak-paneling, were also found the remains of the old piscina.—*Birmingham Daily Post.*

**Edinburgh.**—The heating and ventilation of the McEwan Hall, University of Edinburgh, now in course of erection under the superintendence of Dr. Rowand Anderson, has been entrusted to Mr. Wilson W. Phipson, C.E., of London. The scheme accepted is mechanical ventilation by propulsion, with a low-pressure steam principle of heating, the distribution of the heat for ventilating the hall being similarly arranged to that carried out by him at the Royal Albert Hall, Kensington. At the Scottish National Portrait Gallery, now approaching completion, Mr. Phipson has also carried out, under the same architect, his system of heating by distinct circuits on the low-pressure steam principle, all the water of condensation being returned to the boiler by gravity, the advantage claimed for this method being that each floor is distinct in its heating arrangements, and the temperatures are under control near the boiler, where is fixed the sectional heat distributor.

**The Sanitary Institute.**—Mr. G. W. Hastings, M.P., has accepted the Presidency of the Congress of the Sanitary Institute, which is to be held in Worcester, commencing Sept. 24 next.—At an examination held by Inspectors of Nuisances, May 2 and 3, seventy-six candidates presented themselves. Questions were set to be answered in writing on the 2nd, and the candidates were examined *visu voce* on the 3rd. Thirty-eight candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances. The examination for Local Surveyors will be held on Thursday and Friday, July 25 and 26.

**The Swedish Granite Industry.**—The well-known granite quarries at Stermö and Stilleryd, in Sweden, have been sold to a company, which will increase the number of workmen to 300, and double the output, whilst the granite is to be exported direct in the company's own steamers. Hitherto the stone has chiefly been shipped to Russia, Germany, and Denmark, but now attempts are to be made also to introduce it in the English market.

### PRICES CURRENT OF MATERIALS.

| TIMBER.                     |           |          |          |
|-----------------------------|-----------|----------|----------|
|                             |           | £. s. d. | £. s. d. |
| Greenheart, B.G.            | ton       | 6 10 0   | 7 10 0   |
| Teak, E.I.                  | ton       | 11 0 0   | 12 0 0   |
| Sesquial, U.S.              | foot cube | 0 3 0    | 0 3 0    |
| Ash, Canada                 | load      | 3 10 0   | 5 0 0    |
| Birch                       | "         | 3 10 0   | 5 0 0    |
| Elm                         | "         | 4 0 0    | 5 0 0    |
| Fr. Dantisc, &c.            | "         | 2 0 0    | 3 10 0   |
| Oak                         | "         | 2 10 0   | 4 10 0   |
| Pine, Canada red            | "         | 5 10 0   | 7 10 0   |
| " yellow                    | "         | 3 10 0   | 5 10 0   |
| Lath, Dantisc               | fathom    | 4 10 0   | 5 10 0   |
| St. Petersburg              | "         | 5 0 0    | 6 10 0   |
| Waincoat, Hips, &c.         | leg       | 2 15 0   | 4 0 0    |
| Odessa, crown               | "         | 0 0 0    | 0 0 0    |
| Deals, Finland, 2nd and 1st | std. 100  | 0 10 0   | 11 0 0   |
| " 4th and 3rd               | "         | 0 9 0    | 10 0 0   |
| Riga                        | "         | 7 10 0   | 9 0 0    |
| St. Petersburg, 1st yellow  | "         | 11 0 0   | 15 0 0   |
| " 2nd "                     | "         | 10 0 0   | 11 0 0   |
| Swedish white               | "         | 9 0 0    | 10 0 0   |
| Swedish                     | "         | 9 0 0    | 10 0 0   |
| White Sea                   | "         | 9 10 0   | 17 0 0   |

### TIMBER (continued).

|                                             |      | £. s. d. | £. s. d. |
|---------------------------------------------|------|----------|----------|
| Deals—Canada, Pine, 1st                     | ton  | 18 0 0   | 26 10 0  |
| " 2nd                                       | "    | 11 0 0   | 17 10 0  |
| " 3rd, &c.                                  | "    | 8 0 0    | 10 10 0  |
| " Spruce, 1st                               | "    | 9 0 0    | 11 0 0   |
| " 2nd and 3rd                               | "    | 7 10 0   | 9 0 0    |
| New Brunswick, &c.                          | "    | 6 15 0   | 8 15 0   |
| Betons, all kinds                           | "    | 8 10 0   | 20 0 0   |
| Floors—Boards, 2 1/2, 1 in. prepared, First | "    | 0 11 0   | 0 14 0   |
| Second                                      | "    | 0 8 0    | 0 10 0   |
| Other qualities                             | "    | 0 5 0    | 0 7 0    |
| Cedar, Cuba                                 | "    | 0 4 0    | 0 5 0    |
| Honduras, &c.                               | "    | 0 4 0    | 0 5 0    |
| Mahogany, Cuba                              | "    | 0 0 4 0  | 0 0 4 0  |
| St. Domingo, cargo average                  | "    | 0 0 4 0  | 0 0 4 0  |
| Mexican                                     | "    | 0 0 4 0  | 0 0 4 0  |
| Tobacco                                     | "    | 0 0 4 0  | 0 0 4 0  |
| Honduras                                    | "    | 0 0 4 0  | 0 0 4 0  |
| Box, Turkey                                 | ton  | 4 0 0    | 12 0 0   |
| Rose, Rio                                   | "    | 15 0 0   | 20 0 0   |
| Bahia                                       | "    | 14 0 0   | 19 0 0   |
| Satin, St. Domingo                          | foot | 0 0 8 0  | 1 0 0    |
| Porto Rico                                  | "    | 0 0 8 0  | 1 0 0    |
| Walnut, Italian                             | "    | 0 0 4 0  | 0 0 4 0  |

### METALS.

|                                |     | £. s. d. | £. s. d. |
|--------------------------------|-----|----------|----------|
| Iron—Bar, Welsh, in London     | ton | 5 5 0    | 5 10 0   |
| " at works in Wales            | "   | 4 15 0   | 5 0 0    |
| " Staffordshire, in London     | "   | 5 10 0   | 5 10 0   |
| Copper—British, cake and ingot | ton | 43 0 0   | 44 0 0   |
| Best selected                  | "   | 44 0 0   | 45 0 0   |
| Sheets, strong                 | "   | 50 0 0   | 0 0 0    |
| Australian                     | "   | 50 0 0   | 0 0 0    |
| Chilly, bars                   | "   | 38 10 0  | 0 0 0    |
| Yellow Metal                   | lb. | 0 0 5 0  | 0 0 0    |
| Lead—Sheet, English            | ton | 13 10 0  | 14 0 0   |
| Spain                          | "   | 13 10 0  | 14 0 0   |
| Silesian, special              | ton | 17 10 0  | 17 12 0  |
| Ordinary brands                | "   | 17 7 8   | 17 10 0  |
| Tin—Straits                    | ton | 90 0 0   | 0 0 0    |
| Australian                     | "   | 90 0 0   | 0 0 0    |
| English Ingots                 | "   | 93 0 0   | 0 0 0    |
| Zinc—English sheet             | ton | 21 0 0   | 22 0 0   |

### OILS.

|                        |        | £. s. d. | £. s. d. |
|------------------------|--------|----------|----------|
| Linseed                | ton    | 18 12 6  | 18 17 0  |
| Cocoon, Co. Ceylon     | "      | 27 0 0   | 24 0 0   |
| Ceylon                 | "      | 25 0 0   | 25 10 0  |
| Palm, Lagos            | "      | 24 0 0   | 0 0 0    |
| Kapessed, English pale | "      | 28 10 0  | 0 0 0    |
| " brown                | "      | 25 0 0   | 0 0 0    |
| Cottonseed, refined    | "      | 24 10 0  | 25 10 0  |
| Tallow and Oleine      | "      | 18 0 0   | 45 0 0   |
| Lubricating, U.S.      | "      | 7 0 0    | 13 0 0   |
| " refined              | "      | 7 0 0    | 13 0 0   |
| Tar—Stockholm          | barrel | 1 2 9    | 1 3 0    |
| Archangel              | "      | 0 15 8   | 0 16 0   |

### TENDERS.

[Communications for insertion under this heading, reach us not later than 12 Noon on Thursdays.]

**COLCHESTER.**—For alterations and repairs at cemetery, for the Colchester Joint Burial Board. J. V. Start, architect, High-street, Colchester.—  
F. Dupont.....£275 0 0  
G. Farnan.....220 0 0  
H. Cook.....210 0 0  
T. J. Ward.....210 0 0  
R. B. Son.....185 0 0  
W. Shedd.....178 0 0  
R. Besumant.....170 0 0  
Orfeur (accepted).....133 0 0

**DARENTH (Kent).**—For electric fire-signal system the School and Asylum for Imbeciles, Darenth, Kent, the Metropolitan Asylum Board. Messrs. A. & C. Harris architects, 15, Leadenhall-street, E.C.—  
Binks & Co.....£740 10 0  
Lovett, F. J.....625 0 0  
Bailey & Grundy.....558 0 0  
Sturde & Co.....490 0 0  
Bax, J.....478 0 0  
Wadley Bros.....438 0 0  
Cox & Walker.....438 0 0  
Harrison & Co.....398 0 0  
Blenheim & Co.....389 0 0  
Fowler, Lancaster, & Co.....389 0 0  
Spagnoletti & Crooks.....343 0 0  
Gent & Co.....333 0 0  
Dale & Co., Limited, Ludgate-hill, E.C. (accepted).....318 0 0

**DARENTH (Kent).**—For additional fire-extinguishers at the School and Asylum for Imbeciles, Darenth, Kent, for the Metropolitan Asylum Board. Messrs. A. & C. Harris architects, 15, Leadenhall-street, E.C. Quantities not supplied.—

Jennings & Co.....£350 0 0  
Ruddale & Co.....847 0 0  
McKenney & Co.....732 0 0  
Clements, Jackson, & Co.....690 0 0  
Hayward Bros, & Eckstein.....625 0 0  
Shand, Mason, & Co.....627 0 0  
H. Crane.....585 0 0  
J. & F. May, 259, High Holborn, W.C. (accepted).....520 0 0

**FAY GATE (Sussex).**—For repairs and addition to the residence of Mr. H. M. Beaumont. Mr. R. T. Stoneham, architect, 6, Moorgate-street, E.C.—  
D. Harding, Fay Gate.....£240 0 0  
Roulard Bros, Hordham.....385 0 0  
H. Bridel, London (accepted).....300 0 0

**GLASBURY.**—For the erection of villa resid. Glasbury, Brecknockshire. Mr. W. W. Robinson, architect, 10, King-street, Hereford.—  
Bowers & Co., Hereford.....£295 0 0  
Dakin, Kaubas.....278 0 0  
Evans, Erwood.....800 0 0  
Hiles, Hereford.....780 0 0  
Lewis & Co., Hereford.....755 0 0  
J. Price, Hay (accepted).....710 0 0  
Webb, Hay.....690 0 0  
[Stone and bricks supplied.]



## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                | By whom Required.       | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------------|-------------------------|-----------------------------------|--------------------------|-------|
| Cleft Oak Fencing                            | Willesden Burial Board  | O. Claude Robson                  | May 14th                 | ii.   |
| Private Street Works                         | East Ham Local Board    | W. H. Savage                      | do.                      | ii.   |
| Do.                                          | do.                     | do.                               | do.                      | ii.   |
| Roadmaking and Paving Works                  | Willesden Local Board   | O. Claude Robson                  | do.                      | ii.   |
| Broken Granite                               | Chiswick Local Board    | A. Ramsden                        | May 11th                 | x.    |
| Do.                                          | do.                     | do.                               | do.                      | x.    |
| Making-up Grove Park-road                    | Folkstone Corporation   | A. W. Conquest                    | May 18th                 | x.    |
| Supply of Stone                              | Richmond S.S.A.         | F. Westworth-Shields              | May 20th                 | x.    |
| Sewerage Works                               | Brentford Local Board   | J. H. Strachan                    | May 21st                 | x.    |
| Paving Road                                  | Chichester Vestry       | G. R. Strachan                    | do.                      | x.    |
| Portland Cement, Wood Blocks, Ballast, &c.   | Croydon Corporation     | W. Powell                         | do.                      | ii.   |
| Broken Granite                               | Com. of H.M. Works      | Official                          | do.                      | ii.   |
| Dwarf Walls, Iron Railings, and Tree Guards  | St. Mary, Islington     | J. P. Barber                      | do.                      | xi.   |
| Do.                                          | Yestry                  | G. J. C. Brown                    | May 22nd                 | x.    |
| Cast-iron Tank, Columns, &c.                 | St. Helen's Corporation | Official                          | do.                      | ii.   |
| Broken Granite                               | Canterbury Corporation  | Official                          | May 24th                 | ii.   |
| Shedding, Lambeth                            | Commis. of Sewers       | F. H. Barfield                    | do.                      | ii.   |
| Waterworks                                   | Faringdon Union R.S.A.  | Official                          | do.                      | ii.   |
| Sorting Office, Mount Pleasant               | Com. of H.M. Works      | Official                          | May 25th                 | x.    |
| Drill Shed                                   | Newcastle Regent, Yel.  | Official                          | do.                      | xi.   |
| Sewerage Works                               | Hampton Wick Lee, Bd.   | Official                          | May 27th                 | x.    |
| Waterworks                                   | Liverpool Corporation   | G. F. Deacon                      | May 28th                 | x.    |
| Refuge, Bristol Post Office                  | Com. of H.M. Works      | Official                          | do.                      | x.    |
| Completion of Swimming Bath                  | St. Mary Abbots, Ken.   | T. Verity                         | do.                      | x.    |
| Painting Works, Hyde Park Barracks           | War Department          | Official                          | Not stated               | ii.   |
| Building Down, &c., "Lord Nelson," Greenwich | Mr. J. Smalley          | do.                               | do.                      | ii.   |
| Bulley Lads                                  | School Bd. for London   | Official                          | do.                      | x.    |
| Enlargement of Schools                       | do.                     | do.                               | do.                      | x.    |
| Cutting-out Tables, Rack Cupboards, & Chairs | do.                     | do.                               | do.                      | x.    |

## PUBLIC APPOINTMENT.

| Nature of Appointment.       | By whom Advertised. | Salary.     | Applications to be in. | Page. |
|------------------------------|---------------------|-------------|------------------------|-------|
| Draughtsman in Patent Office | Civil Service Com.  | Not stated  | June 5th               | xvi.  |
| D. E. Draughtsman            | Portsmouth Dockyard | 8s. per day | Not stated             | xvi.  |

**HANDSWORTH (Birmingham).—**For constructing No. 7 section of the arterial drainage works for the Local Board. Mr. E. Kenworthy, A.M.Inst.C.E., Engineer.—G. Tretham, 14, Broad-street-corner, Birmingham (accepted). £730 12 6  
[Pipes provided by the Local Board.]

**HANDSWORTH (Birmingham).—**For the erection of two semi-detached villas, in Hamstead-road, for Mr. Henry Price.—L. Goelling, Birmingham. £1,040 0 0  
J. Archer, Birmingham 1,038 0 0  
J. Kirby, Handsworth 974 0 0  
A. J. Handcock, Handsworth 945 0 0  
J. Drinkwater, Handsworth 878 0 0  
G. Tretham, 14, Broad-street-corner, Birmingham (accepted) 875 10 0

**HEREFORD.—**For the erection of villa residences, Palmer, Hereford. Mr. W. W. Robinson, architect, Davies. £580 0 0  
Williams 551 0 0  
Lewis & Co. 530 0 0  
Boar & Hodges 498 0 0  
Bowers & Co. 488 0 0  
J. Hiles (accepted) 433 0 0  
[All of Hereford. The price is exclusive of bricks and tiles.]

**HIGH BARNET.—**For erecting detached house, High Barnet, for the Rev. J. Matthews. Mr. Geo. Baines, architect, 4, Great Winchester-street, E.C. £1,627 0 0  
R. G. Battley, London 1,398 0 0  
John Currow, High Barnet 1,333 0 0  
J. Ellwood, New Barnet 1,300 0 0  
E. J. Cochard, Leytonstone 1,247 0 0  
J. Baughen, Barnet 1,230 0 0  
John Willmott & Sons, Hitchin 1,194 15 0  
[Architect's estimate, £1,200.]  
\* Accepted.

**HINKLEY.—**For supplying and fixing oak single-nook and panelling, and wood ribbed ceiling, at Higham Grange, Hinkley, for the Hon. E. H. Pierrepont. Mr. R. J. Podgers, architect.—O. Hindley & Sons (accepted). £234 0 0

**KINGSLAND.—**For the erection of carriage-houses and workshops over, for Mr. William Tifford. Mr. Walter Hayes, architect, Winchester House, E.C. £530 0 0  
J. R. Hunt 518 0 0  
J. Mansbridge 518 0 0  
Jarvis & Sons 495 0 0  
Kear 429 0 0  
Ivory 420 0 5

**LINCOLN.—**For the erection of new offices and additions to the Executive Concrete Masonry Works of Messrs. Ramsbottom & Daniels, Lincoln. Mr. W. Mortimer, architect, Lincoln. £215 0 0  
H. S. & W. Close 2270 0 0  
S. Horton 269 10 0  
J. M. Harrison 253 0 0  
E. Crossley 218 0 0  
G. Cowen (accepted) 215 0 0  
[All of Lincoln.]

**LONDON.—**For new shop front and interior fittings to 37, High-street, Hammersmith, N.W., for Mr. Wormald, architect. Mr. Wm. Hunter Turner, architect, 68, Salisbury Pavement, and Halesden, N.W.—S. Yardley & Sons (accepted). £200 0 0

**LONDON.—**For the erection of a school to provide accommodation for 1,200 children on the site in Sandford-road (East Lambeth Division), for the School Board for London. Mr. T. J. Bailey, architect.—S. Belham & Co. £21,180 6 8  
J. Fyerman 16,920 0 0  
G. Parker 20,780 0 0  
J. Shillitoe & Son 20,280 0 0  
D. Charteris 19,658 0 0  
E. Lawrence & Sons 19,209 0 0  
J. Longley & Co. 19,123 0 0  
J. Mansfield 18,948 0 0  
W. Downs 18,423 0 0  
C. Cox 18,151 0 0  
Hart Bros. 18,135 0 0  
\* Amended tender of £17,737 recommended by the Works Committee for acceptance.

**LONDON.—**For the erection of a school, to provide accommodation for 1,200 children, on the site in Poughwood (West Lambeth Division), for the School Board for London. Mr. T. J. Bailey, architect.—S. Belham & Co. £17,298 0 0  
J. Holloway 16,920 0 0  
J. Longley & Co. 16,211 0 0  
J. Shillitoe & Son 15,980 0 0  
D. Charteris 15,863 0 0  
Hugh Knight 15,709 0 0  
J. Mansfield 15,691 0 0  
W. Downs 15,325 0 0  
Kirk & Randall 14,970 0 0  
C. Cox 14,938 0 0  
Hart Bros. 14,890 0 0  
\* Amended tender of £13,575 recommended by the Works Committee for acceptance.

**LONDON.—**For the erection of a school to provide accommodation for 1,200 children on the site in Trinity-street (Finsbury Division), for the School Board for London. Mr. T. J. Bailey, architect.—S. Belham & Co. £18,159 6 8  
Dove Bros. 16,911 0 0  
W. Goodman 16,710 0 0  
J. Longley & Co. 15,053 0 0  
T. Boyce 14,898 0 0  
D. Charteris 14,812 0 0  
E. Lawrence & Sons 14,582 0 0  
C. Cox 14,577 0 0  
\* Amended tender, £13,655 recommended by the Works Committee for acceptance.

**LONDON.—**For erecting new premises for the Billingsgate Christian Mission. Mr. George Baines, architect, 4, Great Winchester-street, London, E.C. Quantities by Mr. J. R. Vining, Rolls-chambers, Chancery-lane.—Higgs & Hill £4,480 0 0  
Higgs & Hill 4,341 0 0  
Higgs & Hill 4,250 0 0  
F. & H. F. Higgs 4,207 0 0  
Colls & Sons 4,189 0 0  
B. C. Nightingale 4,077 0 0  
J. & J. Greenwood 3,977 0 0  
James Morier 3,853 0 0  
Mark Gentry 3,853 0 0  
R. G. Battley, Clifton Works, 21, Old Kent-road, London, S.E.—\* Accepted. 3,895 0 0

**LONDON.—**For forming new millinery room at rear of 220, Upper-street, Islington, N., for Mr. T. R. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.—F. Sage & Co. £379 0 0  
Drew & Cadman 246 0 0  
S. Yardley & Sons (accepted) 243 0 0

**LONDON.—**For alterations to the "Hercules," London-hall-street, E.C., for Messrs. Rolls & Co. Mr. H. I. Newton, architect, 40, Victoria-street, Westminster, S.W.—

T. Osborn, City £1,450 0 0  
C. F. Hewitt, City 1,477 0 0  
S. Godden, Bryanston-square 1,475 0 0  
Philips & Blaker, City 1,339 0 0  
H. Burman & Son, Kensington-park 1,272 0 0  
S. R. Lambie, Kentish Town 1,163 0 0  
J. Beale, Westminster Bridge-road 1,067 0 0  
\* Accepted.

**LONDON.—**For the erection of new shop, refreshment-hall, &c., at rear of 217, Upper-street, Islington, N., for Mr. T. R. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.—J. Grover & Son £2,747 0 0  
Dove Bros. 2,690 0 0  
Williams & Son 2,638 0 0  
G. H. & A. Bywaters 2,307 0 0  
W. Scrivenor & Co. 2,533 0 0  
J. Smith & Son 2,375 0 0  
Wall Bros. (accepted) 2,395 0 0

**LONDON.—**For decorative works to 35, Chepstow-villa, W., for Mr. H. Heaven. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.—Pope & Bray £265 0 0  
B. Colley (accepted) 263 0 0  
Trales & Son (accepted) 223 0 0  
G. H. Carter 221 0 0

**LONDON.—**For building new factory and dwelling-house, William's-court, Summer-street, Southwark, S.E., for Mr. Bibber. Mr. John A. J. Woodward, architect, 10, Crown-villa, Kennington Oval.—Greenwood £284 0 0  
Ford 742 0 0  
Tyerman 726 0 0  
Marland 695 0 0  
Hooper 649 10 0  
J. Beale, Westminster Bridge-road 646 0 0

**LONDON.—**For new counter, cabinet, bar divisions, and lobby, enclosures, &c., for the "Ball and Anchor," Hammersmith, for Mr. H. Brown. Mr. Eugene C. Beaumont, architect, 43, Imperial-buildings, Ludgate-circus, E.C.—G. Coles £1,087 0 0  
G. Fuller 950 0 0  
Collings & Co. 905 0 0  
J. & H. Cook 899 0 0  
Turle & Appleton 820 0 0  
W. H. Lascelles 690 10 0  
Drew & Cadman (accepted) 658 0 0

**LONDON.—**For repairs to be done to six houses, Nos. 48, 49, 50, 51, 52, and 53, Barnbury-road, Islington, for Mr. J. Podgers. Mr. W. F. F. Potter, architect.—H. Duell, Stamford-hill £270 0 0  
R. T. Dary, King's-cross 250 0 0  
J. Kingston, St. Pancras 170 0 0  
W. Wythe, Dalston 168 10 0  
T. Hinton, Pentonville (accepted) 134 15 0

**LONDON.—**For alterations and decorations to No. 54, Portland-place, W., for Madame D'Agostino.—S. Yardley & Sons (accepted). £601 0 0  
[No competition.]

**LONDON.—**For Moulmein teak-wood jewellers' interior fittings throughout, to No. 63, Piccadilly, W., for Mr. George Edward.—S. Yardley & Sons (accepted). £373 0 0

**PLYMOUTH.—**For the erection of chapel, waiting-rooms, lodge, entrance-gates, workmen's rooms, and other buildings, in Wickham-lane, for the Plymouth Burial Board. Mr. H. H. Church, architect, Woodwich.—Marriott £5,423 0 0  
Chapman 5,169 0 0  
Holloway 4,878 0 0  
Stainer & Son 4,825 0 0  
Battley 4,583 0 0  
Longley & Co. 4,560 0 0  
Richardson 4,238 0 0  
Kemp 4,008 0 0  
Procter (accepted) 4,000 0 0  
Martin 3,998 0 0

**PLYMOUTH.—**For the erection of the Plymouth Science, Art, and Technical Schools. Mr. A. D. Shortridge, architect, 14, Old Town-street, Plymouth. Quantities supplied.—J. May £5,786 0 0  
T. Head 5,783 0 0  
Pethick Bros. 5,761 0 0  
Tozer & Son 5,554 0 0  
F. Hovey 5,500 0 0  
G. Shillars 5,476 0 0  
Palk & Partridge 5,472 0 0  
J. Finch 5,440 0 0  
W. Trevena 5,395 0 0  
Laphorne & Gould 5,351 0 0  
R. & C. Rowe 5,165 0 0  
A. R. Lethbridge & Son 5,134 0 0  
T. Kennedy 5,105 0 0  
S. Roberts 5,015 0 0  
A. R. Debnam 4,972 0 0  
[All of Plymouth.]

**SALISBURY.—**For additions to Wick House, Downton, for Mr. Silas J. Taunton. Messrs. Nevison & Newton, architects, 7, Staple-inn, London, W.C.—J. Bailey, Downton (accepted). £2,100 0 0

**SHERE (Surrey).—**For additions to the Surrey Trading Company's Premises, Shere, Surrey. Mr. Geo. Baines, architect, 4, Great Winchester-street, London, E.C.—J. S. Brown, Guildford £880 0 0  
A. Farsons, Shere (accepted) 658 0 0  
A. A. Chumpey, Guildford, near Guildford 850 0 0  
[Architect's estimate, £647.]

**SMETHWICK (Birmingham).**—For the erection of entrance-lodge and out-buildings, at the Uplands Cemetery, for the Smethwick Local Board. Messrs. Harris, Martin, & Harris, architects.  
G. Trenham, 14, Broad-street-corner, Birmingham (accepted). £253 0 0

**STRATFORD.**—For new show-rooms, Broadway, Stratford, E., for Messrs. C. Boardman & Sons. Mr. Geo. Baines, architect, 4, Great Winchester-street, E.C.—  
F. & H. F. Higgs ..... £2,990 0 0  
H. H. Hollingsworth ..... 2,935 0 0  
Mark Gentry ..... 2,850 0 0  
J. Godfrey & Son ..... 2,645 0 0  
B. J. Scott ..... 2,687 0 0  
R. G. Battley ..... 2,697 0 0  
F. J. Coxhead, Leytonstone\* ..... 2,644 12 0  
\* Accepted.

*Show-room Fittings.*  
Drew & Cadman ..... £377 0 0  
Sage & Co. .... 367 0 0  
T. Drake, 72, Great Percy-street ..... 320 2 0  
\* Accepted.

**STRATFORD.**—For erecting new library and kitchen and offices, Magnolia House, the Green, Stratford, E., for Mr. C. Boardman. Mr. Geo. Baines, architect, 4, Great Winchester-street, E.C.—  
R. G. Battley ..... £549 0 0  
B. J. Scott ..... 489 0 0  
F. J. Coxhead (accepted) ..... 400 0 0  
[Architect's estimate, £416.]

**TAUNTON.**—For the erection of new vicarage-house, Holy Trinity. Mr. George C. Strawbridge, architect, Taunton.—  
Templeman ..... £2,900 0 0  
Pollard ..... 2,688 0 0  
A. J. Spiller ..... 2,590 0 0  
H. J. Spiller ..... 2,680 0 0  
Morae ..... 2,494 0 0  
Jones ..... 2,365 0 0

**TAUNTON.**—For the erection of a lawn tennis pavilion, for the Lawn Tennis Club Committee. Mr. George C. Strawbridge, architect.—  
A. J. Spiller ..... £197 0 0  
Morae ..... 189 0 0  
Fox ..... 176 0 0  
Handford ..... 175 0 0  
Jones ..... 165 0 0  
H. J. Spiller ..... 158 0 0  
Rendell & Sons ..... 154 0 0

**TOOTING (Surrey).**—For alterations and additions to "The Prince of Wales," Garrett-lane, Tooting. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W.—  
J. Walker, Poplar ..... £373 0 0  
H. Hurman & Sons, Kennington-park ..... 365 0 0  
S. Godden, Bryanston-square ..... 359 0 0  
S. B. Lamble, Kenish Town ..... 351 0 0  
Isles, Battersea ..... 347 0 0  
Smith, Son, & Fletcher, Belgravia ..... 340 0 0  
\* Accepted.

**WOODFORD.**—For erection of pair of villa residences, Woodford, Essex, for Mr. J. E. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.—  
Wall Bros. (accepted) ..... £2,000 0 0

**WOOLWICH.**—For iron van-ehed on the Dockyard Wharf, for Messrs. C. & C. Tuff. Mr. H. H. Church, architect, Woolwich.—  
Humphreys ..... £198 0 0  
Morton ..... 179 10 0  
Martin ..... 168 0 0  
Main & Co. (accepted) ..... 131 0 0

**WOOLWICH.**—For alterations and additions to the "Royal Oak" public-house, New-road, Woolwich. Mr. H. H. Church, architect, Woolwich.—  
A. J. Fenn (accepted) ..... £184 0 0

**WOOLWICH.**—For alterations and repairs after fire at No. 49, Artillery-place. Mr. H. H. Church, architect, Woolwich.—  
E. G. Covill (accepted) ..... £150 0 0

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# The Builder.

Vol. LVI. No. 2415.

SATURDAY, MAY 15, 1896.

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Halifax Cathedral, Nova Scotia.—Mr. Arthur E. Street, M.A., Architect .... Two Double-Page Photo-Litho's.  
Sculpture from the Royal Academy: "Motherless," and "Bequeathed by Bleeding Sire to Son."—Mr. G. A. Lawson, Sculptor .... Single-Page Typo-Gravure.  
Memorial Statue to Le Verrier, the Astronomer, at Paris.—M. Chapu, Sculptor .... Single-Page Typo-Gravure.

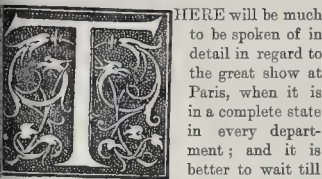
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### The Paris Exhibition.



HERE will be much to be spoken of in detail in regard to the great show at Paris, when it is in a complete state in every department; and it is better to wait till everything is complete before entering into the consideration of separate departments of the exhibits connected with art and construction. But some account of the general impression produced by the Exhibition as it now stands, and viewed as a whole, may be of interest to our readers.

The Eiffel Tower has this practical point in its favour, that visitors to the Exhibition cannot have the slightest doubt, even at night, of the whereabouts of the show; but it is a danger-post only as to direction; as to distance is an illusion; and a visitor not acquainted with the ground would imagine the Tower, especially as seen lighted up at night, to be much nearer than it really is. This deception of scale is only removed on a close approach to the erection, and when within the grounds of the Exhibition; even by daylight, and when seen from the Trocadéro Gardens at the side of the river, the scale is lost, and the Tower seems to be immediately on the opposite bank. From all parts of the grounds except in the immediate vicinity of the Tower this result is the same; the thing is so completely out of scale that the size cannot be apprehended except on a close inspection, and the consequence is that this erection, intended for the glory of the Exhibition, has the opposite result of dwarfing all the buildings forming part of the Exhibition, and reducing the apparent length and width of the lawns and terraces in the centre of the grounds: in fact, the Eiffel Tower, as was said of the monument—

"Like a tall bully, lifts its head and lies" about the whole thing: a lie too big for the eye to believe, and consequently failing in its effect. The principal pavilions of the Exhibition are really constructions on a very large scale; but in regard to these, again, one placed under an entire deception as to scale, and half their effect is thrown away in consequence. In regard to the central pavilion and dome there are faults of scale inherent in the design, as we shall have occasion to

mention; but this is hardly the case with the two principal pavilions flanking the central garden, the architectural style and detail of which, to be described presently, are very good.

Coming close up under the Eiffel Tower, this false impression is changed, as far as the Tower is concerned. Its size, and the grand sweep of its four great arches, then becomes truly imposing, and impresses one the more one examines it. These arches being constructed on the slant, as it were, and all falling inwards towards the centre of the construction, produce a remarkably fine combination of curves seen in perspective in every variety of foreshortening; the drawing of the lower portion of the Eiffel Tower, from any fixed point in its vicinity, would, in fact, be an admirable and crucial subject to set architectural students for a competition in perspective drawing. The lightness of this immense construction in detail, and the gathering up of all the lines from the angle pedestals towards the centre, impart a peculiar spring and elasticity of appearance to this part of the structure. The pedestals themselves are very badly designed, with huge clumsily-profiled mouldings which completely falsify the scale even on near inspection, and one has to discover that it takes twenty long paces from one angle of this lump of masonry to the other, before finding out its size. From this near point of view the height of the Tower of course produces little effect: the upper part, indeed, hardly seems to have any relation to the substructure; and the details which profess to be ornamental, such as the cantilevers and decorations of the first platform balustrade, are all coarse and tawdry in appearance. The element of beauty, as in so many engineering works in iron, is only apparent in the purely constructive lines of the ironwork, and these more especially in this lower portion. At night the large arches are lined out with lights, with fine effect, and the levels of the first and second platform are similarly lined. The electric light at the summit does not appear, at that height, by any means so powerful or brilliant in effect as was promised or threatened. Of the aspect of the Exhibition and the scene generally, as viewed from the top of the Tower, we regret that we cannot here speak, inasmuch as the edifice was closed to the public on Tuesday, the day of our visit, and time did not allow of an excursion to official headquarters for permission to ascend, which would no doubt readily have

been granted. As the only excuse for the thing seems to have been to show experimentally how high modern engineers could build in iron, and as there is a certain excitement in getting up to a great height, there is no doubt the Tower will be ascended by all visitors who have not very giddy heads; as it is there, the only thing is to go up it, there being no other good to be got out of it. But it is a vulgar piece of "brag," of no more sense or merit than the other affair of Babel; and to hint that the Exhibition might have been a failure without it, as we saw suggested in one English paper, is absurd, and argues a very limited appreciation of the real interest of this remarkable display.

Those who have not visited the site will hardly have realised what is the scale and extent of the Exhibition, which is like a small town in itself. It consists of two main portions. On approaching it from the central quarter of Paris, say crossing the Seine from the Place de la Concorde and turning to the right, we come to the smaller main division of the Exhibition, the broad garden grounds stretching from the Invalides to the river-bank, a space about five to six hundred yards in length and two hundred in width. Here there is a complete town of buildings partly representing the architecture and exhibits of the French colonies, partly occupied by Exhibition buildings connected with State departments, the War Department, the Health Department, Education, the Post Office, &c. On the other side of this expanse is a long strip of Exhibition territory running along the Quai d'Orsay, past the Pont d'Alma, and finally connecting the Esplanade des Invalides with the larger expanse of the Champ de Mars. Thus the Exhibition consists of two large sites or parallelograms, radiating from an imaginary centre of a circle, and connected by a narrow strip along the segment of the circumference of the circle formed by the bend of the river. The Champ de Mars territory, however, crosses the river, the Pont d'Jena being bodily included in the Exhibition, and on arriving at the right bank, the Exhibition territory is further continued by a flight of wooden steps and a high-level bridge over the roadway and thus into the Trocadéro gardens.\* Similar staircases and bridges carry on the communication over the public roads at one or two other points; and the visitor who has once passed into the Ex-

\* We gave a large plan of the Champ de Mars and Trocadéro portions of the Exhibition in the Builder for Dec. 4, 1895.



hibition by giving up his ticket at one of the authorised *guichets* must beware of inadvertently walking through any open gate he may come upon, or he will find himself outside the boundary and subject to repayment for entrance before he knows it. On approaching any one of the entrances the visitor will probably be addressed by men offering him a plan of the Exhibition at the cost of 30 centimes.\* Let him not despise this humble assistance, but expend his 30 centimes; the plan is only a block plan, but it is perfectly correct as far as it goes, and affords at once a conspectus of the general arrangement and position of the various departments, and saves all trouble in finding one's way about the place.

Let us try to give the reader an idea of the disposition and appearance of the main section of the Exhibition, on the Champ de Mars.† We have a long parallelogram of ground, at right angles to the river, on the left bank. At the lower end of this district is the great Galerie des Machines, placed across the end of the site from side to side. From the centre of this great hall we advance at right angles up the central avenue of the Exhibition, with long galleries extending right and left on either hand, parallel with the Galerie des Machines. We will describe this portion a little more in detail before proceeding onwards.

The dimensions of the Galerie des Machines have been more than once given in the "Letters from Paris" in these columns.‡ Its appearance justifies all the pride which French engineers evidently feel in it, and it is probably the finest hall ever built for machinery exhibits of this kind. The main construction consists of a series of immense wrought iron girders taking the general form of a Tudor arch section, with solid rivetted plates at the haunches and springing (the springing being from the floor line) and lattice work above. Four purlins on each side, and a central ridge piece, all consisting of light lattice girders, form the longitudinal stiffening elements of the construction. At the sides of the hall are tolerably wide longitudinal aisles in two stories, forming a gallery, the girders of which form a further longitudinal stiffening to the main girders, while the cross girders of the galleries form an abutment at the haunches of the main roof principals. The principals at the springing are, so to speak, shaved down to a narrow bearing having free play on a roller bed-plate. The hall has a splendid light: the central portion of the roof is covered entirely with glass; the lower portion over the haunches is very effectively decorated with the arms and insignia of the principal towns of France. Of the machinery exhibits we say nothing in detail now; they are mostly *in situ*, though not all working yet. The floor-space within the galleries is divided into five aisles by four rows of coupled iron columns carrying a triangular lattice girder affording bearings for the shafting carrying the pulleys for the belting. A remarkable feature in this section of the Exhibition is the splendid display of locomotives (mostly French and German) and railway carriages of all descriptions.

The main avenue, at right angles from the centre of the Galerie des Machines, is connected with it architecturally by a low glazed dome prettily decorated, with painted figures on the spandrels. The gallery crosses the opening, and one of the stairs leading up to it is lighted by the remarkable stained-glass window of "The return of Alsace and Lorraine," designed by M. Wagrez, and which we illustrated on Jan. 2, 1889. The first object we come to in the centre avenue is an enormous bronze sculptural trophy representing a female figure seated on a car, on a platform supported by colossal sea-horses that prance below. Beyond we come to trophies

of metal work and brass founding, and on either side extend galleries, that on the left for "Horlogerie," that on the right devoted to firearms and sporting exhibits. The side galleries, further on, branching out at right angles to the main avenue, are variously devoted to bronzes, furniture, ceramics, textiles, and generally to decorative work of various kinds. None of them are complete, but there is sufficient to promise a remarkable show when they are all filled, this one block of building forming, in fact, a large exhibition of applied art in itself. Among other objects in the central avenue may be especially noticed an organ by Messrs. Cavaillé-Coll, remarkable both for the rich and tasteful design of its case and the weight and power of tone in comparison with its small apparent size. Another prominent object is the high altar intended for St. Ouen at Rouen, exhibited by MM. Poussielgue-Rusand et fils, a sumptuous Gothic piece of tabernacle work, entirely gilt, and relieved here and there by bits of enamel colouring in panels; a frieze of figures crosses the composition, which is further decorated by shrines, statues, and crocketed pinnacles: it is a good piece of work of its kind, but rendered rather gew-gaw in effect by the complete overlay of gilding.

The main avenue is lined in the lower portion of the walls with decorative design of an architectural character, forming a succession of entrance façades, of varying design, to the lateral galleries. Over these are large oblong windows of tinted glass. On coming to the upper end of the avenue we enter the space under the dome which forms the prominent object in the façade towards the gardens.\* The internal treatment of this dome is very rich and effective. It is a Greek cross on plan, with four large arches supporting the dome, which has a main pier of coupled ribs running up into the dome from the four angles of the crossing. In the haunches of the dome are three large windows between each of these ribs, glazed with a warm-coloured stained-glass which contributes well to the colour effect of the whole. Above this the dome is effectively decorated with gold rays and star powdering; below the windows is a large frieze of figure-subjects, with a modillion cornice over. Level with the lower line of the frieze the piers are accentuated by a cornice and pediment with recumbent figures: below these spring brackets designed in very rich open scroll-work acting as supports to the frieze. Half way to the springing a gallery runs round decorated with a wrought-iron railing of very beautiful and original design.

From the doorway under this dome we look up the central garden of the Champ de Mars, seeing in the distance, under the Eiffel arch, the Trocadéro as the close of the vista. The lower part of this open space is bordered by the fronts of the pavilions which contain most of the foreign sections, but all this portion, occupying pretty nearly three sides of a square, is faced by verandahs covering broad asphalted terraces, behind which are collected the principal restaurants. These verandahs, which form the façade of this part of the Exhibition buildings, are prettily designed, with graceful iron columns and brackets, and a large frieze over, very gaily decorated with cartouches with coats of arms or insignia of various countries, over each column, with genii as supporters. Between these are mosaic panels with the names of various countries, combined with wreaths and other ornaments. The decoration hits the mark of giving a kind of gay restaurant character, without vulgarity.

Looking back at the façade under the central dome, which we have just quitted, we find there the most ornate but not the best portion of the external architecture of the Exhibition buildings. Beneath a pediment is an immense arch of what we should call in England late pointed shape—a four-centred Tudor arch, in fact. The broad archivolt is encrusted with ornament in the way of shields

and emblems, all gilded over; the square piers which form abutments to the arch are decorated at the top with enormous gilt masks and in front of them, on the subbase, stand two colossal bronze figures representing Industry and Commerce respectively. At the apex of the arch are two large figures, back to back, supporting the emblematical ship of Paris, which forms the acroterion of the gable. There is what may be called an immense amount of "go" about all this, but a total want of refinement and reticence, and also total disregard to scale. The colossal figure at the base of the piers, as well as the immense figure of Fame on the apex of the dome, poised on one toe and with the other kicking out into the air, entirely dwarf the scale of the whole façade, irrespective of the florid character of the detail.

In the space immediately in front of the façade, and on either side of the central avenue, stand the two comparatively small pavilions of the Municipality of Paris, concerning which it is only necessary to say that one of them is entirely closed to the public, and the other, though accessible, so incomplete in its exhibits that any further notice of it here may well be deferred. Beyond the restaurant façades already referred to, and reaching on either side nearly up to the Eiffel Tower, are the two more important façades of the Palais des Beaux-Arts on the right, and the Palais des Arts Libéraux on the left, in the main precise facsimiles of each other. These are very successful examples of special treatment of a building of this class.

The central feature of each is a dome with console buttresses, roofed with coloured tiles forming vertical ribs on the dome surface with a large horizontal Egyptian "kebab" pattern running round the base and apex of the dome, and the spaces between the ribs marked out into coloured panels with "R.L." in the centre of each. The central feature of the elevation shows in the lower portion three great round arched bays, with windows in the upper portion, the arcade stopping again in square angle-turrets, the crowning portions of which are still in a state of scaffolding. The piers of the arches are huge steles in relief, the two end ones decorated with symbols, the centre ones between the arches having large alto-relief terra-cotta figures of the centre of the stele,—effective in a way, but in too high relief and looking too much as if they were stuck on as an afterthought. The spandrels of the arches are circular medallions; above the arch-heads is a decorative frieze in terra-cotta, interrupted above each of the piers by a square block of masonry rising above the line of the upper cornice, and pierced by a round arched opening in which is seated a statue outlined against the light through the opening, with very pretty effect. At the low end of the façade is a return wing and elevation somewhat in the same style; the upper end is stopped by a simple angle pavilion with a domical roof. The intermediate portions of the façade exhibit an arcade of square piers formed by wrought-iron lattice standards filled up flush with decorative terra-cotta plaques, the piers being further decorated with shields and garlands affixed at the top. Half-way up the piers are cross girders carrying galleries, and further supported by light iron columns standing a little free of each side of the main piers; on these girders is carried a solid or blind balustrade of terra-cotta, forming a sill to the large windows in the upper part of the bay. The windows have iron segmental-headed frames with lattice spandrels, into which are woven realistic looking sprigs of foliage, executed in wrought-iron, and specially painted; a mistake in taste which is to be regretted. Above the window-heads and the string-course is a gold-ground frieze, on which are panels adorned with wreaths, and with Cupid-like supporters on each side; in the panels are the names of eminent men, inscribed in gold on a blue ground. The whole of the front is in iron and terra-cotta, the latter a warm red, the ironwork painted a delicate grey-blue tone. The whole effect is very good.

\* It is marked on the title page "50 centimes," but was selling in the streets at 30.

† We gave a general view of this main portion of the Exhibition, with the Eiffel Tower, in the *Builder* for Feb. 4, 1889.

‡ We gave a view of the interior of this vast hall in the *Builder* for Dec. 17, 1887. The bases of the great girders have, however, been altered in execution from the design shown there.

\* For an exterior view of this dome and the central portion of the façade of the "Palais des Expositions Diverces," see *Builder*, Jan. 21, 1888.



and as an architectural treatment of a building for a large temporary exhibition it is the best and most successful that we have ever seen.

Between these two long wings of building stretching up either side of the Champ de Mars, the space is laid out in broad lawns with walks between, with beautifully-kept grass. A series of white statues, equally spaced, lines the vista on either hand; and not only have these a charming decorative effect as a whole, but they are mostly worth looking at separately, which is more than can generally be said of similar embellishments on such occasions in England. Instead of Venus di Medicis and Apollo Belvideres, and the other worn-out stock-in-trade of "classical" sculpture, these are mostly examples of modern works of French sculpture with a distinct individuality. A portion of the centre of the ground is occupied by a large fountain and a long basin on a lower level, whence minor jets arise. As the centre-piece of the main fountain is seen the immense group of allegorical sculpture formerly described in a Letter from Paris,—the ship of France with a battering-ram at the prow, a seated female figure in the vessel, another steering, and various attendant figures: this great group comes into the view up the axis of the Champ de Mars from the top or bottom end, as a kind of centre-piece. Viewed in this light, it is far too ragged in outline and composition for the highest sculptural effect; here again, as in the case of the central facade before described, we may say that there is great energy and vigour of conception and design, marred by want of refinement and self-restraint. As to the colossal subsidiary figures that sprawl about this fountain,—people tumbling off rocks into the water, and playing antics on the backs of dolphins, we fear they can only be described as vulgar.

Of the pavilions in the rear of the verandahs at the lower end of the ground, those on the right looking from the centre dome, including the exhibits of the Low Countries and Great Britain, are almost entirely complete, and were so, we believe, on the opening day, and it is a gratification that our own contingent should have set an example of punctuality where it seems to have been very much needed. The section of the Low Countries appears to contain a good deal of good decorative work in the way of furniture, inlay, ceramics, and textiles. The boundary between this and the British Section is marked only by one or two small decorative arches or portals spanning the main aisles. The British Section seems to be to a great extent what we may call a manufacturers' exhibition, with a certain amount of decorative work. The centre position is occupied by Messrs. Jackson, the plaster and papier-mâché modellers, with a circular domical erection on eight coupled columns, exhibiting the capabilities of their special slab plaster manufacture. This is a conspicuous object which cannot well be overlooked; there are no doubt other exhibits of considerable decorative interest which may be mentioned when we have opportunity to go more into detail; but the impression produced by a rapid general inspection is that there is more of the commercial than the artistic element in this section.

Of the two larger pavilions higher up, the Section of the "Arts Libéraux" (a not very intelligible title) is evidently intended to illustrate various branches of manufacture; but it is in such an exceedingly bare and primitive stage at present that it may be passed over just now without further notice. The Beaux-Arts Section, on the contrary, is complete with the exception of a room here and there still in the hands of picture-hangers, and the central hall of the Retrospective Exhibition (the hall in which the lunch took place on the opening day), and of which the upper galleries, where the paintings are hung, were still closed to the public. The sculpture hall, running transversely across the buildings between the British section and the picture-galleries, is splendidly lighted; it

is a large hall with a gabled roof and side galleries, the roof entirely glazed between the galleries. The sculpture exhibits here are very numerous, and include a good many able works, but not, as far as we observed, representing much of the highest school of contemporary French sculpture. The galleries appear to contain a considerable quantity of architectural drawings, but are still closed to the public. Beyond this Hall is the large range of picture-galleries, containing an immense variety of works fairly representative of contemporary French painting, both in its merits and defects. Very large canvases abound; in some cases far too large for the subject treated, and in not a few cases combining energy and vigour with coarse execution and disagreeable colour. Among recent works that are known to fame are Maignan's immense picture of "The Tocsin," a collection of spirits or demons of discord flying around or out of a monster bell in full swing; M. Bouguereau's large painting of "Silenus," which has been seen in London, and his charming smaller painting of Cupid and Psyche with two children flying through the air; M. Benjamin Constant's powerful and splendidly-coloured but brutal picture of an execution in the Harem; M. Duez' large moonlight landscape with cattle which has been mentioned in our columns as one of the attractions of a recent *Salon*—a fine work but far larger than the nature of the subject can justify; Dettaille's fine painting of the dreaming soldiers in bivouac on the night before a battle; M. Lefebvre's exquisite ideal of Psyche, and a much larger work with many figures, representing Diana surprised while bathing. M. Henner is represented by several fine works in his peculiar manner. In the centre of the range of galleries is the great hall devoted to the retrospective exhibition of the works of deceased French artists. It is a Greek cross on plan, with a dome with pendentives, carried on four iron arches or arch-shaped girders; there is a great window in each recess, under which are painted in panels the names of eminent artists; Houdon—Rude—Barye, under one; David—Ingres—Delacroix under another; the other spaces are not filled up. The galleries from which the pictures are to be seen are reached by two wide staircases on each side of the hall, carried up on elliptical arches on each side, with fine effect; but these galleries were closed at the time of our visit. On the floor of the Hall a small collection of sculpture is arranged, not so numerous as to encumber the floor or take away from the spacious appearance of the apartment; and on the walls under the galleries is hung a collection of architectural drawings, including finely-executed coloured elevations of important buildings, and restorations of ancient buildings. These we will examine in detail on another occasion.

The majority of the picture galleries are occupied by French paintings, but other countries are represented on a smaller scale in separate rooms, and the British School has three rooms,—one still incomplete and closed at the time these notes were taken. English painting is not represented so well, perhaps, as might have been wished; the collection includes some works of rather mediocre standing, and some of our best men are not represented by their best works. Yet, while considering that French sculpture (at its best) is quite at the head of the world of art, in regard to painting we cannot but think that even disinterested spectators would feel that in the English rooms they were in the presence of an art marked by much more refined sentiment and more delicate perception of colour than is the case with the majority of the French work; always excepting, in regard to colour, the works of M. Constant, who as a colourist may be said to be absolutely unequalled at present. Among the best representative works in the English rooms are Mr. Watts' "Hope" and "Judgment of Paris"; Sir John Millais' portrait of a little girl, called "Strawberry Blossoms," if we remember right; Mr. Herkomer's noble portrait of a

"Darke Ladye" in a dark dress, which fascinated every one at a recent Academy exhibition; Sir F. Leighton's "Andromache"; two splendid seas by Mr. Moore; two fine examples of Mr. Hook's sea-painting, with his own portrait by Sir John Millais hanging between them; Mr. Burne Jones's "Cophetua"; Mr. Orchardson's "After"; Mr. Croft's "Marlborough"; Mr. Tadema's large picture of the sleeping priestesses ministered to by the townspeople; Mr. Fulleylove's "Oxford from Magdalen Bridge"; Miss Montalba's "St. Mark's, Venice"; one or two good specimens of Mr. Boyce's paintings of old buildings, &c. A small collection of English sculpture placed in these rooms includes Sir F. Leighton's "Sluggard," Mr. Maclean's "Spring," translated from a picture of Mr. Tadema's; Mr. Thornycroft's "Mower" and "Teucer," and Mr. Gilbert's "Icarus."

The space on either side of the Eiffel Tower is laid out in winding walks, and occupied by various minor pavilions, most of which, though finished externally, bear the legend "defense à passer" on their doors. Conspicuous among these erections is a great reproduction of an ancient Mexican temple, as a home for the Mexican exhibits; the very gay and gaudy pavilion of the Argentine Republic; the Brazilian tabernacle, equally florid but less polychromatic, opposite to it; a smaller erection with an Egyptian facade with coved cornice and winged globe, which we believe has some relation to Suez. Across the top of the site, along the bank of the river, runs the interesting collection of model dwellings illustrating the "Histoire de l'Habitation"; these are tolerably complete, but merit more detailed notice than we can give to them in the present general summary.

Returning along the long narrow strip bordering the river, towards the Esplanade des Invalides, we pass between galleries devoted to agricultural implements (on the right) and food products (on the left), and crossing the Place d'Alma by a high bridge with a very steep stair, we come on another long strip of land running up to the Invalides, continuing the same class of exhibits, partly French and partly foreign. Within this line of buildings a railway of diminutive gauge runs with *chars-à-banc*, starting from the Invalides and, after skirting the river front of the Exhibition, running down the side of the Champ de Mars outside the line of buildings. Coming on to the Esplanade des Invalides, we look down a long vista between a number of buildings of various types of architecture, the dome of the Invalides, somewhat too gaudy in its evidently recent gilding (which brings it too near and destroys its scale very much), filling up the vista. Walking down the central avenue, and turning our back to the Invalides Dome, advancing gradually towards the river frontage (as we supposed the visitor to do on the Champ de Mars), the following is a general memorandum of the structures which constitute this separate small town of the Exhibition. On the right is a collection of buildings for the French colonies, many of these being elaborate imitations of the architecture of the colonies represented. On the left are French exhibits connected with various State services. The right hand forms a kind of Oriental street, the left hand represents modern French architectural taste mostly; the contrast is curious and piquant. Immediately on our right, when standing at the lower end and looking towards the Seine, is the circular building for the panorama of "tout Paris," which need not detain us here. In front of this is a model building showing a compartment of a French primary school, with its desks, maps, and gymnasium complete: the architectural treatment simple and suitable, but striking an English eye oddly as being "stone with brick dressings" instead of the reverse. Opposite this is "Train Sanitaire" and "Am-bulance," and "Maisons ouvrières" in the rear. On the right we come next to the pavilion of the Indian Archipelago, and above that the extraordinary and monstrous-looking pagoda representing the nightmare architecture of Cambodia, with its successive cornices with growths of nondescript gilded ornament

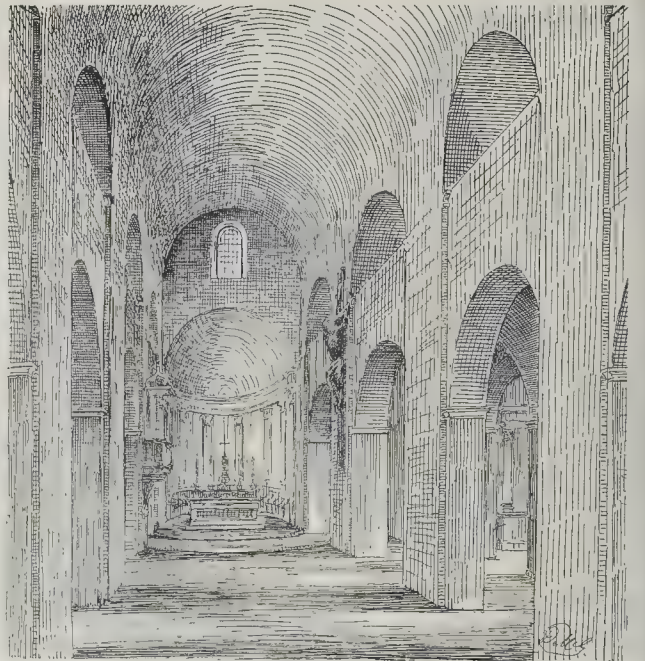


on all the upper lines: the main walls are painted a subdued red, which appears intended to indicate a sandstone—not very successfully. Next comes the Cochin China pavilion, with the Cochin China village in the rear: the pavilion is a tiled one surrounding a courtyard, of a wooden construction painted in very strong colours, blue yellow and red, and with panels containing landscapes or decorative designs sketched in black lines on a white ground, in a quasi-Japanese taste. Opposite this, in curious contrast, is one of the most characteristic of the French pavilions, that of "Hygiène de l'Habitation." This is a white cement façade with three large arched bays, with wrought iron grille doors in the lower portion: there is a plinth formed by inlaid marbles in slabs and flat strings, and in the upper portion the front is decorated with large scrolls of foliage in the Italian Renaissance manner, painted in colour on the white walls: the ironwork of the grilles is painted a pale grey. The whole effect is very bright, and has an appearance quite in keeping with a palace of Health. In front is Cordonnier's fine seated terra-cotta statue of "Hygiène."

Above the Cochin China pavilion on the right is the large "Palais Central" of the Colonial Exhibition, at present closed (as indeed are most of the pavilions of this quarter, and those that are open are nearly empty), which seems intended to sum up a kind of general Oriental character, but it is not happy in design or colour; it is a post and pan construction, with bright red stiles and panels which seem intended to be filled in with painting; a basement of masonry to the whole. Next comes Annam and Tonkin, a brilliantly-painted pavilion with turned-up eaves at the angles, painted decorative panels with blue borders, and windows filled with pierced carved work and a small oblong open light in the centre. We are here opposite the centre of the great pavilion of the War Department, a long Classical Roman façade set a good way back from the main avenue, a courtyard in front of it occupied by specimens of artillery, and with a model of an ancient mediæval gateway with circular flanking towers, looking oddly out of place, in front of the courtyard. The façade of the main building is a grandiose kind of thing in its way. The central feature has coupled Corinthian columns on either side of a great archway, with an immense cornice over, and seated statues on the pedestals over the columns. The end pavilions are decorated with great bas-relief steles with sculptured trophies. As in the case of some other parts of the Exhibition buildings, the design shows great vigour, if it is rather deficient in refinement. The intermediate parts of the façade are very simply treated, with a pilaster Ionic order and a large attic above with pilasters decorated with sculptured *fascies*. A trophy of tricolour flags in the centre of each wing shows with brilliant effect against the white background. The interior exhibits in this pavilion are still very incomplete.

The last important pavilions on the right are those of Tunis and Algiers, which are exceedingly bright and picturesque erections. The Tunis pavilion shows an arcade with horseshoe pointed arches with black and white voussoirs, opening on the inner courtyard; the two side wings are curiously varied, the left with white walls and red window fittings; the right with the walls in buff and red courses with pale blue window fittings and woodwork. The Algerian pavilion is a charming example of imitative architecture, with rich tile diapers on the walls, overhanging timber and plaster upper stories, and pierced windows in Saracenic patterns. Adjoining it is an arcade of shops, where native workers are engaged. Opposite this picturesque and highly-coloured erection the classic pavilion of the "Postes et Télégraphes," painted a kind of cream tint with some of the details relieved in pale blue, looks very correct and elegant, but rather tame.

Such is the general impression of one day's visit to this great collection, which when



*Interior of Venice Cathedral.*

complete will take the most industrious spectator a week to even look at in any detail. Even in its present incomplete state it is a remarkable spectacle; and when all the departments are complete and arranged, there can be no question that it will be the most wonderful collection of the products of human art and industry which has ever been got together simultaneously in one exhibition.

#### ARCHITECTURE OF PROVENCE AND THE RIVIERA.

**T**HE work published under this title\* by Mr. David MacGibbon, the joint author with Mr. Thomas Ross of the important work on the "Castellated Architecture of Scotland" which we have previously noticed, gives an interesting review of the architecture of a district which is perhaps rather better known, at all events to architectural students, than the author seems to be aware of. Although among the numerous illustrations with which his book is adorned there are no doubt sketches of a good many buildings which are not familiar, the nature and character of the architectural remains of the district are pretty well known. Of course, however, Mr. MacGibbon is right in estimating it as much less known than the architecture of the north of France, though certain buildings or remains, such as the Roman remains at Arles and Orange, are being painted or drawn continually, and, indeed, tend to become almost hackneyed.

The special interest of the architecture of this portion of France consists firstly in the extent of Roman remains still existing there, and secondly in the strong infusion, in the post-Roman remains, of the Byzantine element which at one time pervaded so great a portion of the church-building world of Europe, and which seemed to have found a specially congenial soil in the south of France. The two elements seem combined in a curious manner in the portion of a sculptured monu-

ment from Arles Museum (engraved as fig. 18), in which the link between Classic and Romanesque, and thence to Gothic, is indicated by the arcade which forms the architectural framework of the figures, and which shows segmental arches springing from the caps of a kind of rude Corinthian column, including on the archivolt a rude but quite recognisable indication of the modillion, with its decorative leaf. It is Spalato carried a step further.

The great interest of the phase of architecture chiefly considered in this book is, in fact, the illustration which it gives of the transition from Roman to Mediæval architecture. The actual Roman remains, such as the theatre at Arles, and the Maison Carrée at Nîmes, are familiar figures; and Tennyson has noted—

"What Roman strength Turbia showed  
In ruin, by the mountain road;  
How like a gem, beneath the city  
Of little Mousas, basking, glowed."

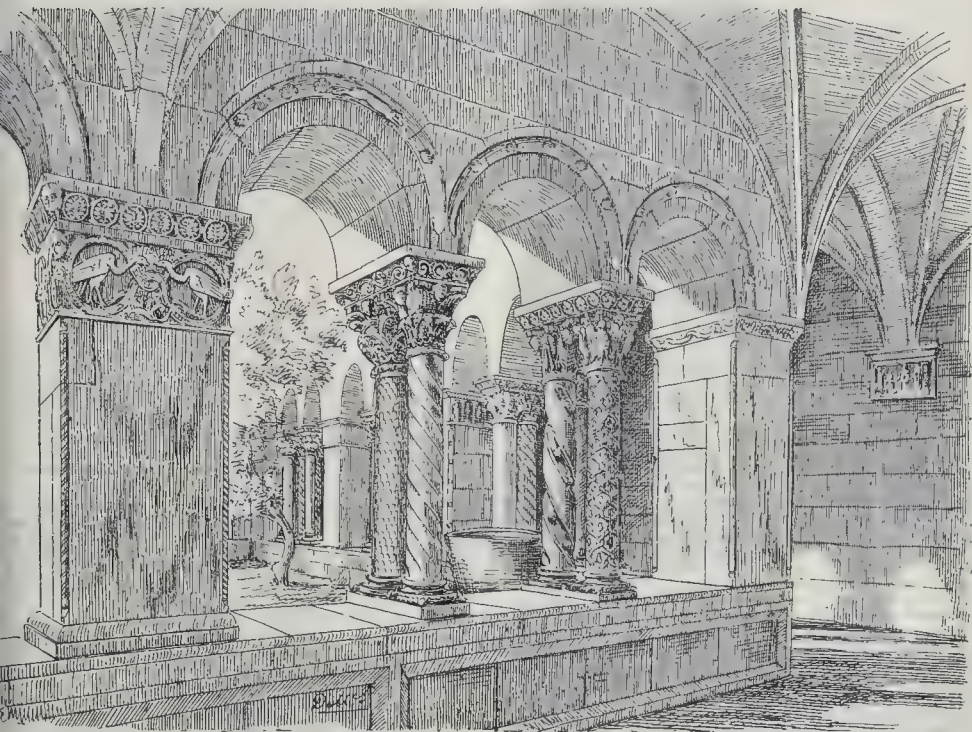
The contrast is picturesque, and obvious to every one; but the blending is even more interesting, and only fully obvious to the student of architectural developments. Mr. MacGibbon has added something to the illustration of this phase of architecture. He has given a well-written chapter to a review of the transitional period and its characteristics, and a great deal of illustrative sketching of the examples of the early Mediæval period, of what Fergusson distinguishes as the "Neo-Byzantine style." Mr. MacGibbon divides Provençal architecture into two styles, that in which debased forms of Roman ornamentation yet remained, and that in which this had been swept away through the ascetic influence of early monkish orders which condemned all ornament and decoration, and which thus was the means of more or less obliterating the tradition of Roman detail, and leaving the field clear for the growth of the new types of Mediæval detail. This may perhaps be the case as far as Provence was concerned; in a general way it may be said that the links between Roman and early French Gothic detail are very complete, and show an almost unbroken descent for the Gothic capital from the Classic. Such an interior as that of the

\* The Architecture of Provence and the Riviera. By David MacGibbon. Edinburgh: David Douglas, 1888.



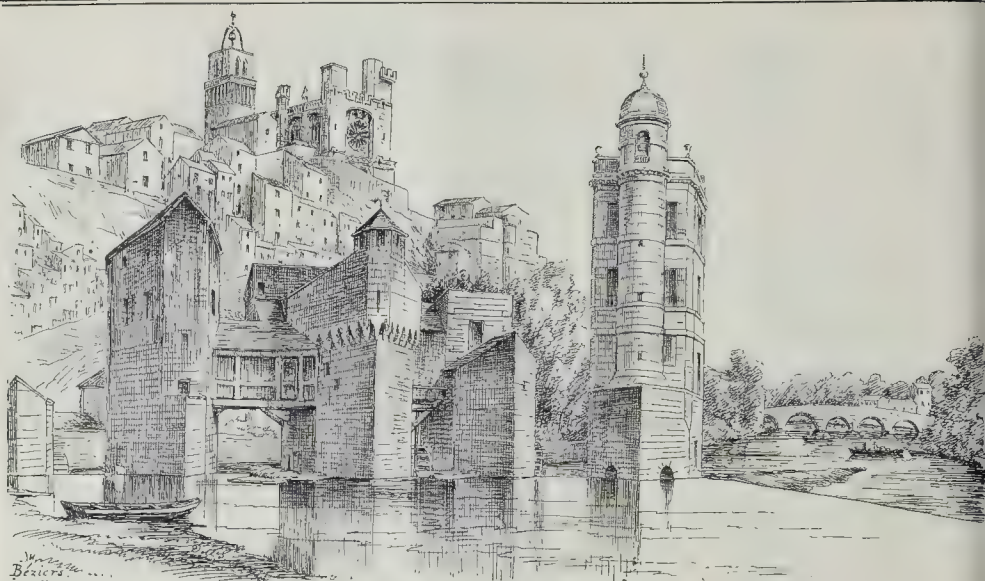


*Interior of Church, St. Paul-du-Var.*



*Cloisters, Elne.*





View of Béziers, from the River.



Tower of Villeneuve.

Cathedral at Venice,\* however, of which an illustration is appended, certainly seems to present an entire obliteration of Classic ornament, leaving merely the bare form of the Romanesque arcaded and barrel-vaulted

\* This and the other illustrations appended are reproduced from Mr. MacGibbon's drawings made for the book (and which he has kindly lent us for the purpose), but not on quite the same scale. The book itself, we may observe, contains nearly 300 such illustrations.

church, not unimpressive in its simplicity. As an indication of the scale, it may be mentioned that the nave is about 18 ft. 6 in. wide within the piers; the aisles are about 10 ft. wide. The choir, which ends in an apse internally, is nevertheless square externally. The exterior, of which a view is given which we have not reproduced, is as plain as the interior, and looks more like a castle

than a church. This building the author attributes to the twelfth century. We should have given it an earlier date. The Church of St. Paul-du-Var, near the same neighbourhood, of which also we give the interior view is of almost equal plainness, but with the pointed arch, with the heavy transverse roof rib belonging to early vaulting, and so prominent a feature in St. Front and other churches of its type and neighbourhood. As far as we can gather, the author would refer this church and Venice, three miles distant, to the same date. A comparison of the two interiors, at all events, hardly conveys the impression.



TOURETTES.



ROQUEBRUNE.

Fonds.

Among the places specially visited and described is the ancient town of Elne, in Roussillon, a town standing on a height in the plain at the base of the Pyrenees, said to have been in ancient times a seaport, but now separated from the sea by a level expanse of country. It is a few miles south of the better known ancient town of Perpignan. The church at Elne, as viewed externally, is another of the extraordinarily castellated-looking churches which are found here. The drawings of its cloister we reproduce: it is an exceedingly fine and picturesque specimen of arcaded work of this type; the variety in the treatment of the shafts is remarkable.

The view of Béziers, an old town of Roman foundation, and which was an important



tified port in Mediaeval times, is a good sample of the picturesque effect of the solid stilted architecture which abounds so much in these Provençal towns. At the top of the hill, overlooking the town, stands the cathedral of St. Nazaire, seen in the distance from the sketch. This cathedral was in itself rated as a fortress. "It was surrounded by fortified *enceinte*, and forming the chief model of the town, it was strongly built and signed for defence. The transept is the best portion, dating from the twelfth century. The southern angle buttresses are crowned with a parapet, pierced with flanking loopholes, angled so as to send missiles in every direction." Throughout the illustrations we see constantly on the same kind of stern stilted architecture; blind masses of wall erected only here and there with a small opening. The streets of the towns are arched and buttressed over, in a manner often picturesque, but which was part of the same practical endeavour at giving the greatest strength and stability to everything. No one sample could be more typical, perhaps, of this type of architecture than the tower of Milleneuve, which forms or formed the bridge of Avignon. It stands on the bare eminence like a sentinel, with its heavy machicolated cornice frowning over. It was built in the commencement of the thirteenth century. The Castle of Tarascon, shown in fig. 64 in the book, is another noteworthy example of massive castellated architecture, with round towers at the angles of the main block of building, while the walls are broken at intervals by square towers, the machicolations identifying out all round at the top of each with a curious effect.

Of the two fonts illustrated, that from Courtes is, as will be seen from the date, merely a little piece of seventeenth-century eccentricity, but the one from Roquebrune is really interesting little bit of out-of-the-way design, with a good deal of character about it. The book gives a most interesting survey of the peculiar architecture of the district, of which we have only alluded to a few examples. The illustrations are rather weakened in effect, to our thinking, by over-lading and lining everywhere; they would have been more effective if the pen had been used with more restraint; their style, too, with a few exceptions, is a little hard and mechanical. They have the appearance, however, of being careful and accurate sketches, and as such afford a valuable summary of the architectural features of the district, to which Mr. MacGibbon's volume will furnish a useful guide for those who wish to visit the places described with the same object, while it gives a great deal of information for those who have not the opportunity of doing so.

## NOTES.

THE London County Council has held two meetings since last week's *Builder* was published. At the first of these (as will be seen by the report which we give in another column) the Council agreed, but by a very narrow majority, to adopt the recommendation of the Special Committee on the question of Council Chamber accommodation, and to expend 10,000*l.* or so in alterations at the Spring Gardens premises. It was admitted by those members who championed the Committee's report that the proposed alterations were, at best, only likely to meet the wants of the Council for the next few years, and that additional premises would have to be hired for the accommodation of the staff displaced by the enlargement of the present Board-room. There is no doubt considerable force in the arguments used by some speakers against the proposal to at once build new and adequate buildings, viz., that the Council is not yet in a position to know its own wants in this respect, and that, after the lapse of a few years, it will have a better knowledge of its requirements. But the report of the Committee having been carried by a majority of only two in a Council

not numbering two-thirds of its entire strength, it seems to us to be scarcely fair to the building trade to invite tenders for the proposed alterations, and then, when the tenders come before the Council, to raise anew the whole question whether the work shall be carried out or not, as seems to be the intention, judging from the conversation which followed the division. The Council should certainly definitely make up its mind whether it wants the work done or not before putting builders to trouble, expense, and waste of time in tendering.

THE origin of the myriads of small grains or spherules which form the bulk of our oolitic limestones of Portland, Bath, Doulting, Ancaster, &c., has always been enshrouded in mystery. Many attempts have been made to solve the problem, the best of which, perhaps, assumes that particles of sand, shell, or other matter, being brought into the presence of water containing a very high percentage of carbonate of lime, are covered by successive concentric layers of this lime as they are gently wafted about on the shallow sea-floor. New particles are continually brought into the field of operation and are in turn enveloped, the accumulation of these spherules eventually becoming of great thickness, forming in time a compact limestone. The structure of the small grains in any ordinary oolitic freestone is exactly in accord with what we should expect to find supposing this hypothesis to be true, whilst the latter is a perfectly rational explanation of the subject, inasmuch as we know of deposits of similar nature in process of formation at the present day. Still, we have always had some doubts as to whether the formation of the spherules in certain very coarse oolites (pisolites) was capable of explanation in the same way, and the current number of the *Geological Magazine* contains an illustrated article by Mr. E. Wethered, F.G.S., in which he shows that these coarse spherules have an entirely different origin. He demonstrates that they are, in reality, the remains of very lowly-organised animals referable, probably, to the foraminifera. Worm-like calcareous tubes with well-defined walls are bent and twisted around the central nucleus. Some of these tubes occur in irregular aggregations, whilst others are simple concentric twists. The spaces between the tubuli are filled up with crystalline calcite. The masses of pisolitic and oolitic spherules are nearly always cemented together with earthy carbonate of lime. On exposure to the atmosphere the cementing material is removed, and the spherules then stand out in relief and after a time become detached, and in this way the stone gradually decays. This is an important contribution to our knowledge concerning the weathering of limestones, in that it assists to explain why certain kinds of oolitic grains weather better than others; on the one hand we have spherules with a nucleus surrounded by earthy carbonate of lime which easily weathers, and on the other the nuclei of the spherules are enveloped by minute tubes usually made of sub-crystalline calcite,—a more durable form of lime. *Ceteris paribus* the latter is the more durable kind of stone, but the character of the material cementing the spherules is variable, and ought always to be taken into consideration in any question of this nature.

THE newly-elected Professor of Archaeology, Mr. R. S. Poole, delivered his inaugural lecture at University College on Wednesday, May 8. Professor Poole began his lecture by a warm and graceful tribute to the work of his predecessor, Sir Charles Newton, a work which was necessarily confined exclusively to the field of *Classical Archaeology*. That a considerable section of the public hoped this tradition would be maintained cannot be denied, but the electors of University College have shown by their choice of Mr. Poole that they desire the work of the chair to extend over a wider field, and they approve the scheme by which he divides his labours

with specialists of high mark in the several departments of the subject. Professor Poole expressly stated that in his inaugural lecture he intended to deny himself all rhetorical expression of his personal enthusiasm for archaeology, and even any definition of the scope and method of his subject, and that he would confine himself to an elucidation of the programme before him for the coming term. The next two lectures are to be given by Prof. Boyd Dawkins on "Prehistoric Archaeology,"—one is to be given at University College, the other is to be a "clinical" demonstration class at the British Museum. "Savage Art" comes next, by Mr. Henry Balfour, of the Pitt-Rivers Museum, Oxford. The Professor himself takes Egyptian and Assyrian Archaeology, and in the Assyrian demonstrations is assisted by Mr. Evetts. It will be seen that, so far, no place is given to Greek Archaeology. This is not because Prof. Poole holds it lightly in esteem, but because he has in this matter the desire to meet a special practical need. He gives an introductory lecture on June 12 on "The Place of Archaeology in School and University Education," and proposes, during the vacation, to begin classes of an educational character, especially for students in archaeology, in the Final schools at Oxford and Cambridge. It will be abundantly evident from this sketch that the new Professor will make his office no insecure; he has, moreover, issued an invitation to all intending students to take counsel with him at his house any day between the hours of nine and ten a.m. As Keeper of Coins his unceasing efforts to make the collections of the Museum accessible to students are well known; as Professor it is his great aim to systematise these efforts. His warm reception last week may, we hope, be an earnest of wide usefulness and popularity.

THE case of the Queen v. The Corporation of Newcastle is one which shows the desire which corporate bodies have to enlarge their sphere of action. To paraphrase a legal maxim, "it is the duty of a Corporation to increase its jurisdiction" in the eyes of the Corporation officials. The Corporation of Newcastle, by certain Acts of Parliament and by-laws, has powers to approve or disapprove of new buildings. It disapproved of one because they were of opinion that being a dwelling-house in tenements its erection would depreciate the character of the neighbourhood. The Court, of course, held that the Corporation could only disapprove of such buildings as violated some regulation or by-law. The idea of disapproving of a building because it depreciated the respectability of a neighbourhood is highly comical. There would be no end to the disapprovals if the contention if the Corporation had been upheld, and they might have even got so far as forbidding the erection of any building which was not in some particular style of architecture.

AT its usual weekly meeting on Tuesday last, the London County Council had before it the long-pending question of the appointment of an Engineer, in succession to Sir Joseph Bazalgette. As will be seen by the report of the proceedings which appears in another column, the Council has decided to appoint two officers,—a Chief Engineer, at a salary of 1,500*l.* per annum, and a Mechanical Engineer at a salary of 500*l.* per annum. It cannot be said that the salaries thus offered are excessive, if even they are adequate, considering that pensions have been abolished by the Council; but there was the usual nonsense talked by the so-called "economists." Councillor William Saunders moved that the salary to be paid to the Chief Engineer be 1,000*l.* per annum. Councillor John Burns seconded this,—somewhat inconsistently in view of his dictum, at a recent meeting of the Council, that no man's services were worth more than 500*l.* a year. This amendment was lost by a large majority. In connexion with this proposed appointment, a further amendment was moved by Councillor Lloyd, to the



effect that the Chief Engineer to the Council be not allowed to take private pupils, as was stated to have been the practice of Sir Joseph Bazalgette. This amendment was strongly supported by a few members of the Council, on the ground that the Chief Engineer would be required to devote his whole time to the duties of his office. From the tone of their speeches, some of these Councillors were evidently under the impression that such pupils (if any) would not be trained in the office of the Engineer to the Council, but at some private office or *atelier*. Councillor Brudenell Carter expressed the opinion that the Council were likely to get a higher class of applicants for the post if they did not impose any restriction as to pupils. Councillor Hunter spoke to the same effect, and said that the salary of £1,500 a year offered to the Chief Engineer compared very unfavourably with the £3,500 a year paid to Mr. Lyster by the Mersey Dock and Harbour Board, though the work which had to be done in London was quite as onerous. Councillor Horsley also spoke in favour of allowing the Chief Engineer to take pupils, arguing that the Council would "get excellent work out of them." Councillor Jackson "did not see why the office of the Engineer to the Council should be a nursery for instructing the future engineers of this country,"—which is certainly a narrow-minded Vestryman-like view of the question. Without pronouncing for or against the continuation of the pupilage system in the offices of municipal engineers, it may be pointed out that, if it has some disadvantages, it has in the past resulted in training for the public service some of the foremost municipal engineers of the day. Councillor Lloyd's amendment was rejected.

**MR. SHIRLEY F. MURPHY**, who was on Tuesday last elected Medical Officer of Health for the County of London, has already, although comparatively a young man, done good service to the public in connexion with sanitary matters. Some years ago he was, if we mistake not, Medical Officer of Health for St. Pancras, but for the last few years he has held an appointment as one of the Medical Inspectors of the Local Government Board.

**THE** Bishop of London is about to issue a Commission to examine, and report upon, the desirability of carrying out a union of benefices which is proposed between the existing united rectory of St. Edmund the King and Martyr, and St. Nicholas Acons, Lombard-street, in Langbourne Ward, and the existing united benefices composed of the rectories of All Hallows' Lombard-street with St. Benet Gracechurch, St. Leonard Eastcheap, and St. Dionis Backchurch. The first-named united rectory dates from after the Great Fire, when St. Nicholas Acons Church,—its precise situation, as well as the derivation of its name, being now unknown,—was not rebuilt. The London and County Banking Company's premises, in Lombard-street, cover the site of the rectory-house, and the old parish engine or "bone" house, which latter, according to custom, stood near, if not next to the Church. The then London and County Bank removed in 1846 from No. 71 to No. 21, Lombard-street, which house, in the year 1746, was known by the sign of the Anchor and Crown, and thirty years later by that of the Three Kings when occupied by Smith, Wright, & Gray, bankers, who afterwards amalgamated with Esdales & Co. The present premises, since enlarged, were built, in 1860, after the designs of the late Mr. C. J. Parnell, architect. We are informed by the Secretary and the Manager that on the demolition of the rectory-house some vaults were found beneath, containing human remains, and also the bed of a stream—possibly that of the Langbourne, which flowed through this quarter. The site is leased from the Ecclesiastical Commissioners. Some interesting particulars about the history of the parish property were rehearsed in course of a recent suit arising out of the contested administration, by the Charity Commissioners, of the City of London

Parochial Charities Act, 1883. That dispute turned, as in two previous instances, upon the vexed question as to whether certain property had been lawfully scheduled by the Commissioners as "charity property" within purview of the Act. In the case of St. Nicholas Acons the property includes a small sum (261l. 15s. 10d.) in Consols, some rents for rights of light over the existing parish churchyard, and two parcels of land, next westwards of Nicholas-lane, formerly, it is alleged, part of the churchyard, and now occupied by part of the banking-house above-mentioned. St. Benet Gracechurch, corrupted into Gracechurch, as rebuilt by Wren, was pulled down a few years ago in pursuance of the Union of Benefices Act, 1860. With this parish had been united that of St. Leonard Eastcheap, otherwise termed St. Leonard Milkchurch, in Bridge Ward Within,—a church which was not rebuilt after the Fire, and whereof a portion of the graveyard was dug up for making Monument railway station. St. Dionis Backchurch, dedicated, it is said, to the memory of Dionysius the Areopagite, stood in Fenchurch-street, at the southern end of Lime-street, and was demolished a few years since. St. Edmund's has also been styled St. Edmund's Gracechurch, from the ancient market in this quarter; and in the parish books of St. Benet, or Benedict, were entered many curious items of the defacements and restitutions that ensued, respectively, upon the accession of Queen Mary and that of her sister Elizabeth. Three labourers, for example, received 2s. 4d. for pulling down the "altars and John," a day's work; in 1642 the "superstitious brasses," stripped from off the gravestones, were sold for 9s. 6d.

**THE** following are a few quotations from a long report to the Local Government Board (February 22), by Mr. Spear, on "Sanitary Administration in the Bridgend Registration District, Glamorganshire, with special reference to the arrangements existing in the district for the discharge of the duties of Medical Officer of Health." The registration district of Bridgend covers an area of 107,957 acres, or about one-fifth of the whole county of Glamorgan:—

**"Bridgend and Cowbridge District.**—Wherever in this district there is a collection of dwellings, sewage nuisances have been allowed to arise. Generally speaking, the liquid refuse flows in dilapidated gutters or over bare surfaces to the nearest water-course or to some stagnant pool; solid excreta accumulate for long periods in privy pits, often mere holes sunk in the vicinity of the dwellings, while ashes and household refuse are scattered indiscriminately over the surface of the ground. In only two places did I find that any serious attempt had been made to provide for the sewerage of a locality. . . . For Aberkenfig, a mining village, and the most populous part of the rural district, the authority has for years had the question of sewerage under consideration; and it is alleged that the difficulty of obtaining land for outfall works has proved an insuperable bar to their action. Meanwhile the nuisances that have arisen here in consequence of inaction are extreme. In this village of Aberkenfig the only attempt in the district towards public scavenging has been made. An arrangement has been entered into with a neighbouring farmer to remove ashes, &c., deposited in certain fixed receptacles provided by the authority, and also to cleanse periodically the bed of a brook running through the village, into which much of the sewage finds its way. The equivalent offered for this service is the value of the manure removed; and the arrangement, owing probably to the smallness of the remuneration, has not answered, and the work is neglected. The emptying of cesspools, privies, &c., is everywhere left to owners or occupiers of houses. Cesspit privies of most objectionable type and construction are still erected under the direction of the authority, and where water-closets are provided, the discharge pipe is often left unventilated. It is only exceptionally (in the case of a few houses at Porthcawl) that flushing apparatus for water-closets is provided. . . . In both the Cowbridge and Llanharan districts, I found the grossest nuisances prevailing in consequence of the defective methods of excrement disposal: in both, I found houses that from structural condition were unfit for human habitation; and in both I found, amongst other ill conditions, that, in the absence of water supply, people resorting to streams polluted by crude sewage. . . . At Porthcawl, in the western district, the medical officers of health are never consulted respecting the administration of

the building bye-laws, nor, except for a few general remarks in one of Dr. James's reports as to the advisability of the ventilation and disconnection of house-drains, do I find that any attempt has been made on their part to fulfil this important function of their office. Accordingly, the most important bye-laws, from a sanitary point of view,—as to construction of drains, cesspools, privies, foundation of houses, the ventilation of bedrooms, &c.,—are habitually ignored. Under the Dairies, Cowsheds, and Milkshops Order, premises are registered upon the advice of the inspector of nuisances alone. . . . The medical officers of health are never consulted of the subject. . . . The effect of this system of sanitary management is to obliterate the most important function,—that of an adviser of the sanitary authority,—of the medical officer of health; and in this its turn disorganises the whole sanitary machinery.

**Bridgend District.**—The great want in this district is a proper system of sewerage and drainage. . . . The most important of the main sewers are constructed of rough masonry, and could only be properly used for the conveyance of storm-water. One at least consists of the natural rough bed of a more or less stagnant stream that has simply been arched over. Into these channels, upon which the sanitary authorities annually spend 30l. in attempting 'disinfection,' most of the pipe-sewers that have been constructed discharge. These latter are very imperfectly ventilated, and one, intended to serve the populous locality of Old Castle, is laid out so shallow that several small branch streets cannot be connected. The private drainage of the town is generally much in need of attention. Drains, I am told, are often found constructed of brick or stone, and leaky. They are generally unventilated, and water-closets are not provided with water for flushing purposes. . . .

**Meastey District.**—There are many houses in this district so damp, dilapidated, ill-ventilated, and otherwise ill-provided (in matters of drainage and sometimes of water supply) as to demand the attention of the authority with a view to their closure. The Llynfi and Tondû Coal and Iron Company, the great employers of labour in the district, are the owners of some such houses; and since the pinch of falling prices was felt, several cases require the removal of their workpeople, as a condition of employment, to occupy the houses in their possession. The requirement is inimical to the health and comfort of the men and their families, and in several instances has led to the vacation of more decent dwellings for others unfit for habitation. . . . Ventilation of sewers is very imperfectly provided for. The main and other channels spoken of receive as a rule sewage in a form the most offensive and most difficult of removal, that is to say, when far advanced in decomposition, from the overflow of cesspits, &c. Closets consisting merely of roughly-bricked holes with an overflow to the nearest sewerage-channel still exist in large numbers. . . . No official representation has been made by the medical officers of health as to the houses in the district unfit for habitation.

**Ognore and Garra District.**—The sewage, or such of it as gets removed from the neighbourhood of dwellings, practically all finds its way into the streams. . . . At Pontycymmer a large number of water-closets are put in connection with the main emptying of pails is left to the tenants, and their only practicable plan is to bury the contents in their tiny plots of garden ground, usually unventilated and often rising steeply from the backs of their houses, or descending steeply to those of their neighbours. I am told that after heavy rains it is not infrequent to find excrement washed down to the very doors of the dwellings. In this place Pontycymmer, typhoid fever is indigenous.

**Cowbridge District.**—Such sewers as exist are a very rude construction, consisting chiefly of the old stone highway drains. . . . The sewers discharge into the little River Thaw at a part spoken of as the Poplar Pool, 200 yards or so from the centre of the village, and somewhat nearer the grammar school and other houses. In summer the water here is almost stagnant, and at Poplar House, close by, used as a private day-school, the inmates complain of its offensiveness. Moreover, within a mile of its course (*sic*), the stream traverses the village of Llanbleithan, in the rural district, where some of the inhabitants complain of, while others drink, the water. The Cowbridge authority have lately, in direct contravention of the provisions of the Rivers Pollution Prevention Act, and of all sanitary proprieties, greatly added to the pollution of this pool by constructing a new pipe-drain from the cattle market to empty into it. A few pan and water-closets are connected with the sewers described, but for the most part excrement is disposed of in cesspits. The pan-closets are made large and deep, and with a view to the soaking away of their contents. They stand often close by and even against the walls of houses, and when full the excavation of supplementary holes appears to be commonly preferred to the removal of the accumulated filth. Privy accommodation of this sort is not only provided by private property owners and builders, but is that chosen by the authority. . . . In a house-yard only 11ft. square a deep cesspool was excavated about two years ago, and the medical officer of health tells me



that since that date there have been amongst the inmates of this house three attacks of "croup," repeated attacks of gastro-enteritis, one of true diphtheria, and a death from "epidemic pneumonia." The authority make no provision for the removal either of excrement or house refuse. . . . Dr. Meller (the medical officer of health) has not yet reported on the sanitary condition of the town, but has notified the recent outbreak of disease. He states that he is never consulted by the authority, and the recent further pollution of the Thaw by the action of the authority, and the recent construction by them of cesspools such as I have described, were without his approval. . . . Much of the wretched house property in the town belongs directly or indirectly to town councillors."

Mr. Spear concludes by recommending the appointment of a medical officer of health who shall comply with the terms of his appointment in "making himself acquainted with all causes affecting, or threatening to affect, the health of his district," and suggests that, under the circumstances, a combined appointment, or the appointment by the sanitary authorities severally of one man, ought, in the interests of the district, to be made.

IN Dr. Ballard's report to the Local Government Board (February 13) on the prevalence of diphtheria in the Camelford Rural Sanitary District, the following were among the conditions noted in the district as favourable to the development and spread of the disease:—

"One unwholesome condition is observable almost universally, namely, dampness of the walls of dwelling-houses, and especially of workmen's and labourers' cottages. This is due to two causes: one of these is absence of spouting at the eaves, and the other is the fact that the dwellings are generally constructed of irregular-shaped, slabby pieces of slate rock, the refuse of the quarries, laid out in such a way that rain beating on the wall outside tends to run downwards towards the inside of the dwelling; further, the mortar used having been made with sea-sand, is consequently absorbent and retentive of water. Hence it is not only the basements of houses which are apt to be damp, but the bedrooms also. Deliable stands high, rain is abundant, and wind often violent in the winter, so that walls thus constructed readily get soaked through, and dry but tardily.

"Setting aside the town of Camelford, which, it appears, has been pipe-drained, there is observable generally in the district an absence of systematic and efficient drainage. . . . 'Nuisances,' as defined by the 91st section of the Public Health Act, require but scant attention as respects removal or abatement, and it may fairly be said none at all with a view to prevention. . . . Many cottages are without any privy accommodation. In these instances the common practice is to empty excrement out of domestic vessels upon a midden heap, sometimes close to the house, raking some ashes over it to obscure its offensiveness. . . . The water supply in many instances, are liable to dangerous pollution. . . . Dr. Jerome, who accompanied me in my inspection of the sub-district, pointed out several wells supplying dwellings, both isolated and situated in the villages and hamlets, which had been sunk in a porous soil within a few feet of undrained stables, cowsheds, or the like." The following memorandum is worth note, as a part of the brighter side of the picture:—

"One redeeming feature of the district is the remarkable cleanliness which I observed in the interior of the dwellings of the labouring class. Persons of this class evidently aim habitually at cleanliness and neatness of themselves and their children, as well as at domestic cleanliness and neatness. Both are exemplary. However damp the slate floor might be, and however damp the walls might be, all was usually clean within, and the women and children clean and neat also. Such people deserve the aid of their sanitary authority in maintaining cleanly surroundings for their houses."

**A MEMORIAL CROSS** to the memory of Madame Jenny-Lind Goldschmidt, from the design of Mr. C. B. Birch, A.R.A., has just been erected in Malvern Cemetery. It is of a very simple character; a cross rising from a base of Swedish granite; in the face of the granite, just beneath the base of the cross, is a circular medallion inlaid with a marble bas-relief of a lyre and laurel-wreath, with a ribbon bearing the word "Excelsior."

**WE** print in another column a letter of remonstrance which has been laid before the Improvements Committee of the London County Council in regard to the church of St. Mary-le-Strand. We commend

to the attention of the persons who are clamouring to pull down this church not only the terms of the letter, but also the list of names by which it is signed. Possibly the London tradesman and his allies may come to the conclusion that a building which not only architects, but men so eminent in literature and art as Mr. Browning, Mr. John Morley, Sir John Millais, and Mr. Tadema, consider worth preserving, may have a little more value as an architectural adjunct to London than they were quite aware of.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—III.

1834. "St. Cecilia; design for stained-glass": Mr. George Parby. A window with late Gothic buttress and canopy work in nearly white glass, enshrining a figure of St. Cecilia in finely-designed drapery, white with yellow diapers; the head of the figure is sweet though too quiescent in expression for St. Cecilia; it is relieved against a background of crimson diaper within the canopy work. The architectural detail is not altogether in the style of treatment for stained-glass: not flat enough.

1835. "St. Michael's, Waterloo-Ville, Hants; Sketch: Design": Mr. Leonard Stokes. A charming little pencil drawing of a building which may be a house, a school, or a nunnery, or several other things of various kinds; a plan would have told us something about it. The centre block has two gables with wide bay windows under them and a door and porch with small columns forming a shadow between them; the windows are very picturesquely varied in design and treatment; the wing projecting on the right, with three rather large traceried windows above and very small lights below, gives the idea of a chapel with a crypt under it; the small plain octagon bell turret at the re-entering angle adjoining this wing is very well placed; the whole design is very picturesque though with the simplest treatment. The drawing appears to be by the same draughtsman as No. 1819, and unfortunately it is marred by the same rough and rather clumsy suggestions of foliage in the foreground. The architectural portion is admirable as a bit of clean effective pencil sketching.

1836. "(1) Tower of the Badia, Florence. (2) Church of Notre Dame de l'Epine. (3) South-west Tower, Senlis": Mr. Arnold B. Mitchell. Beautiful examples of finished pencil drawing of architectural subjects; the centre drawing of Notre Dame de l'Epine especially so. This is almost in pure outline, the richness of detail in the subject itself preventing any appearance of bareness in the drawing, which is only heightened by a few little "dark" touches here and there. The main vertical lines are done with a ruler, a method which does not belong perhaps to the highest school of architectural perspective drawing, but it is in keeping with the whole style and object of the drawing, in which neatness and finish are aimed at.

1838. "Building in course of erection for the Institute of Chartered Accountants": Mr. John Belcher. Of this, or at least of the original competition drawings, we gave illustrations in the *Builder* of January 12 of this year. There are two elevations, and small plans are given in the corner of the drawing. Like all Mr. Belcher's designs, this is marked by a great deal of originality, but it may be rather questioned whether some elements in this originality are quite in "good accent and good discretion." In the ground-floor, where there are square-headed windows with rusticated piers between, there is no distinction made between the treatment of the large library on the left side and the small offices on the right, the two halves of the design being symmetrical. The first-floor windows are square-headed with a kind of entablature over them, and with mullions and transoms; over the entablature is a semi-circular window, looking like a small mezzanine. On the string level with the entablature of these windows stands a plain Roman Doric engaged order occupying the upper portion of the design (with circular-headed windows between), and carrying the main cornice, which seems too light for the building, as the order on the other hand seems too heavy for the cornice and for its position, and we cannot say that the effect is very harmonious. The portion of this upper storey that is beneath the window-sills is occupied by

a continuous sculptured bas-relief, into which the aforesaid quasi-mezzanine windows cut rather awkwardly. The effect of the segmental pediment over the principal entrance, with the two little side scrolls curling out of it, is also rather more odd than happy. The wall space between the ground and first-floor windows is very agreeably broken by terminal figures which rest on the cap of the lower rusticated pilaster, and rise above and break the line of the first-floor string. The way these figures are inserted is one of the best points in the design, which is of considerable interest as an attempt to use the elements of a Classic façade in a novel manner, though we do not regard it as entirely successful.

1839. "New Parochial Schools; St. Bartholomew the Great, E.C.": Mr. Aston Webb. Another bit of original work, but as this does not deal with such rigid material as Classic detail, it is easier to be original without giving a shock to architectural orthodoxy. The building stands at the back of St. Bartholomew's Church, the apse of which is seen rising behind; it is almost impossible to describe it exactly, except to say that it shows a very picturesque effect obtained mainly from the mere grouping and placing of doors and windows, and of a low octagonal bell turret which seems to grow out of an angle of the building. The inscription "Schools: St. Bartholomew," is playfully introduced between small strings, so as to run round the angle of the building, which is shown in a happily touched and effective pen drawing.

1841. "Parsonage, Church of the Good Shepherd, Courthope-road, Hampstead": Mr. James Brooks. This we illustrated a little while since (March 23 of this year). It is a house picturesque in the outline of its plan, and the intention appears to have been to bind together this rambling outline of the plan by running across it two level series of millioned windows all of the same height and treatment: but the effect is a little flat and monotonous.

1843. "Design for a Village Church": Mr. Gerald C. Horsley. An exceedingly simple little church of one aisle only (plan appended); a small perfectly plain square tower with a conical roof with eaves overhanging, and two pieces sliced out of each face just under the eaves for louvers, gives the only bit of marked character to the building. A lean-to porch projecting from the nave wall to the outer face of the tower connects the latter with the composition; a buttress projects at the point where the chancel arch occurs. A buttress is constructionally required here, and none is used anywhere else. The church is such a one as might be built with local labour on local materials in a country place.

1845. "Design for Proposed Residence, Sutton, Surrey": Mr. W. Hilton Nash. A coloured elevation of a red-brick house with red-tiled roofs, and bands of white brick introduced in the lower portion of the walls. In a considerable portion of the elevation the upper portion is half timber work with long parallel vertical posts. The conservatory-looking erection on the roof at the right looks out of keeping with the style of the rest of the house.

1847. "Design for an Academy of Arts": Mr. B. Willock. This looks as if it were meant for the site of the National Gallery; a large columned portico is projected in the centre, and a rather narrower one at each end, the latter being crowned with cupolas, while the centre one has no such finish, but there is a large dome behind over the centre (we presume) of the plan, which is not given. The centre portico is projected too far and would thus interfere with the view of the whole façade, and materially shorten it from many points of view; and this intrusive effect of the centre portico is rather increased than otherwise by the fact that it has no crowning feature over it; as it seems to have stepped out all this way from the line of front for no purpose.

**The Sanitary Institute.**—At a meeting of the Council of the Sanitary Institute, held on the 8th inst., Sir Douglas Galton, K.C.B., F.R.S., in the chair, it was resolved to present a memorial to the President of the Local Government Board with reference to the measures for the consolidation of the statutes relating to sanitation and the housing of the working classes. Fifteen Members and Associates were added to the register, and twenty-four applications were read for election at the next meeting.



### Illustrations.

#### RESTORATION OF TEPIDARIUM, CARACALLA'S THERMÆ.

**T**HIS is a reproduction from Professor Aitchison's fine water-colour drawing, No. 1,864 in the Architectural Room at the Royal Academy, called in the catalogue "A Study in Colour of the Tepidarium of Caracalla's Thermæ." In our plate, of course, the colour element is unavoidably absent, and the lithograph does not convey any just idea of the effect of the drawing in this respect; but it gives Professor Aitchison's idea of the architectural design of the Tepidarium, which it may be interesting to compare with that by the late Professor Cockerell, published in the *Builder* for March 23 last.

For Professor Aitchison's own ideas as to the Roman Thermæ, and this particular department of them, we must refer the reader to the full reports of his Royal Academy lectures which have recently appeared in our columns.

#### NEW CATHEDRAL, HALIFAX, N.S.

THE new cathedral for Halifax, Nova Scotia, will stand on a site (lately purchased) bounded on the west and north by important thoroughfares, while a third street will run directly westward from the west front. The instructions given were that the church should provide accommodation for 1,000, that there should be no central lantern, and that the morning chapel should be at the west end. A simple style has been selected, and one which should show the connexion with the mother country. The plan has been arranged symmetrically, so as to obtain some of the stateliness of a cathedral, without great size. The drawings explain themselves, but it might be added that the morning chapel is to have a flat panelled ceiling, and the library will be over it. The cost is estimated at 60,000. The first stone was laid some few months back, and it is hoped that a regular start may soon be made. The drawings illustrated have been made from the full-size details, which are complete. The architect is Mr. Arthur Edmund Street. The drawings are exhibited in the Architectural Room at the Royal Academy.

#### SCULPTURE AT THE ROYAL ACADEMY.

THE two works illustrated this week, "Motherless" and "Bequeathed by Bleeding Sire to Son," are respectively numbers 2,036 and 2,023 in the Royal Academy, and stand in the Octagon Hall, and are both by the same sculptor, Mr. G. A. Lawson. The group entitled "Motherless" is an admirable example of the treatment in sculpture of a subject from everyday life, and is noteworthy both for its genuine pathos and for the fine composition of the group.

#### MEMORIAL STATUE TO LE VERRIER.

THIS is the memorial statue at Paris to Le Verrier, the great French astronomer who, almost concurrently with the English astronomer Adams, discovered the planet Neptune, having previously predicted its existence and its place in the heavens, by the analysis of the perturbations of Uranus. He is represented as pointing with his finger to the spot on the celestial globe where the new planet should be.

The statue is by M. Chapu, and has been erected in the court of the Observatory at Paris.

**Liverpool Architectural Society.**—A paper was read at a meeting of this society last Monday, by Mr. J. Starkie Gardner, of London, entitled "Early English Ironwork." The meeting was presided over by Mr. E. Kirby, F.R.I.B.A. (President of the Society), and after the paper was concluded a vote of thanks was proposed by Mr. G. E. Grayson, and seconded by Mr. J. M. Hay. The annual meeting of the Society will be held on Monday, May 27.

**The Arts and Crafts Exhibition Society.**—The second exhibition of this Society will open in the New Gallery, Regent-street, on October 7,—the days for sending in will be the 16th, 17th, and 18th of September. We hear that a new departure will be made in the sale of the exhibits, in which, it will be remembered, the Society last year took no part. The Society, however, will make no profit upon the sales. The evening lectures will again be a feature of the exhibition.

#### AN ELECTRIC RAILWAY IN SCOTLAND: LOCOMOTION BY WATERFALL POWER.

ONE of the attractions of the Forestry Exhibition, Edinburgh, a few years ago, was a very small and not very elegantly finished, though sufficiently illustrative example of railway travelling by means of electricity supplied *en route* from a stationary, or more strictly speaking, non-locomotive, depot. This was the first, and, until very recently, the only movement in that direction within the bounds of the Northern Kingdom, although the subject has all along been canvassed with some interest. An electric railway for the actual performance of daily work has at length been attained, and that under rather novel circumstances. This new and still not quite finished railway, although it is to carry, and, indeed, already is carrying, both passengers and goods, is not the production of a joint-stock company heralded by a roscate prospectus, but that of a private gentleman who did not herald his little scheme at all; and the electricity is not generated by steam-power, although coal is abundant and of low value there, but simply by catching up for that purpose a dribble of the squandered force of a neighbouring waterfall, a source of power long talked of all over the world, but hitherto hardly at all drawn upon except for the driving of mill machinery planted in the immediate vicinity of the force exerted.

North-going travellers by the London and North-Western know Carstairs Junction, the first express stoppage after Scotland is entered, and the place where the train divides itself into two parts, one proceeding north-west to Glasgow and the other north-east to Edinburgh. This is in the close neighbourhood of the three great "Falls of Clyde" of the guide-books, situated two or three miles to the south-west; and of numerous lesser falls, also, which would have been well heard of on their own account but for the more commanding presence of these others. Scotland's pioneer electric railway starts from this junction. The grounds of Carstairs House, a property lying to the south and west, come to within a narrow space of the station buildings; but the mansion itself is situated at some distance away, near to the southern or opposite boundary of the policy, and it is between these two points that the enterprising proprietor, Mr. Joseph Monteith, has laid down his modest, yet highly interesting, and perhaps typically promising, strip of railway track. Road-making at this point is of very old date, for close to the mansion, and within the bounds of the property, a few hundred paces to the south, and not far from the remains of a military camp, passes one of the trunk causeways of the ancient Roman province of Valentia, connecting the Hadrian and Antonine barriers, with still discernible traces of the style of work affected by these stern civilisers of eighteen centuries ago. Mr. Monteith's modern contribution to the science represents a tremendous advance in principle; and yet it is humble enough in its proportions, extending as it does to rather less than a mile and a half, on a narrow gauge of 2 ft. 6 in. Leaving the junction (whose metals, of course, it does not join, owing to the broken gauge), the line soon enters the demesne lands, and there it keeps all the way to its terminus at the mansion house, after a somewhat devious course; by this means, however, securing a comparatively level road, while at the same time affording a passing glimpse of the choicest bits of park scenery here available.

The railway, with its equipment of plant, will perform all the service between these two points hitherto done by horse-drawn carriages and carts over the ordinary roadway; at least, that is understood to be the present thought and intention of the builder and proprietor. For passenger accommodation there is a car mounted on four wheels, the rest of the rolling-stock consisting of luggage-vans, and wagons for coal and other rough commodities. The electric motor, which is fixed to the passenger car below the floor and is capable of working up to 14-horse-power, is of the Gramme order, with a tooth-wheel which, by an endless chain, communicates its revolutions to a corresponding wheel on the driving axle, and thus realises the desired locomotion.

By far the most interesting feature, however, is the original source of the power which is hereby electrically exerted, and has already resulted in a speed of over thirty miles an hour, accompanied by the certainty of a considerable

increase when the installation is completed up to the scope of the primary design. It is a region of waterfalls; and the three chief Clyde cascades in the vicinity have for some years been discussed as comprising an exhaustless outflow of demonstrative energy, capable of being partially embraced, reclaimed from uselessness, and applied electrically to various local, and also more distant, functions; but these particular stores of unutilised force are still untouched. The Mouse Water discharges into the Clyde immediately above the lowest of the three great falls, after passing turbulently through some glen and ravine scenery of a most striking kind. The principal leap of this tributary is the Cleghorn Falls, situated three miles up from its junction with the Clyde, about the same distance westward from Carstairs House, and not far from the point where the Roman Causeway above spoken of crosses the Mouse flood on its way to the north. A turbine placed in fitting position at the break of these falls drives the dynamo to which it is immediately geared, the current being then conveyed by wires carried aloft on poles over the three miles of intervening distance, to within two hundred yards of Carstairs House. Here the wires, suitably insulated, are led to an underground conduit, and are thus carried to the acting battery, which has place in convenient proximity to the mansion house terminus of the line. Along the line the current finds passage by insulated conductors, one on each side of the track, and into the motor itself by brushes projecting from the sides of the car, these, when the latter is in motion, maintaining the necessary flow of current by means of the passing contact or friction, which contact may be suspended at will, and the train brought to a standstill. The power of the descending water at Cleghorn Falls is not to be confined to the service of this railway, if the proprietor realises his full design; but will in time drive all the mill machinery on the home farm, light up the mansion house, and discharge other less important departments of work on the estate. A circumstance greatly to be regretted in connexion with this railway locomotion in Scotland is the death of a young electrician, an assistant of Mr. Monteith in these projects, who on one of the trial runs fell from the car to the track and was fatally injured.

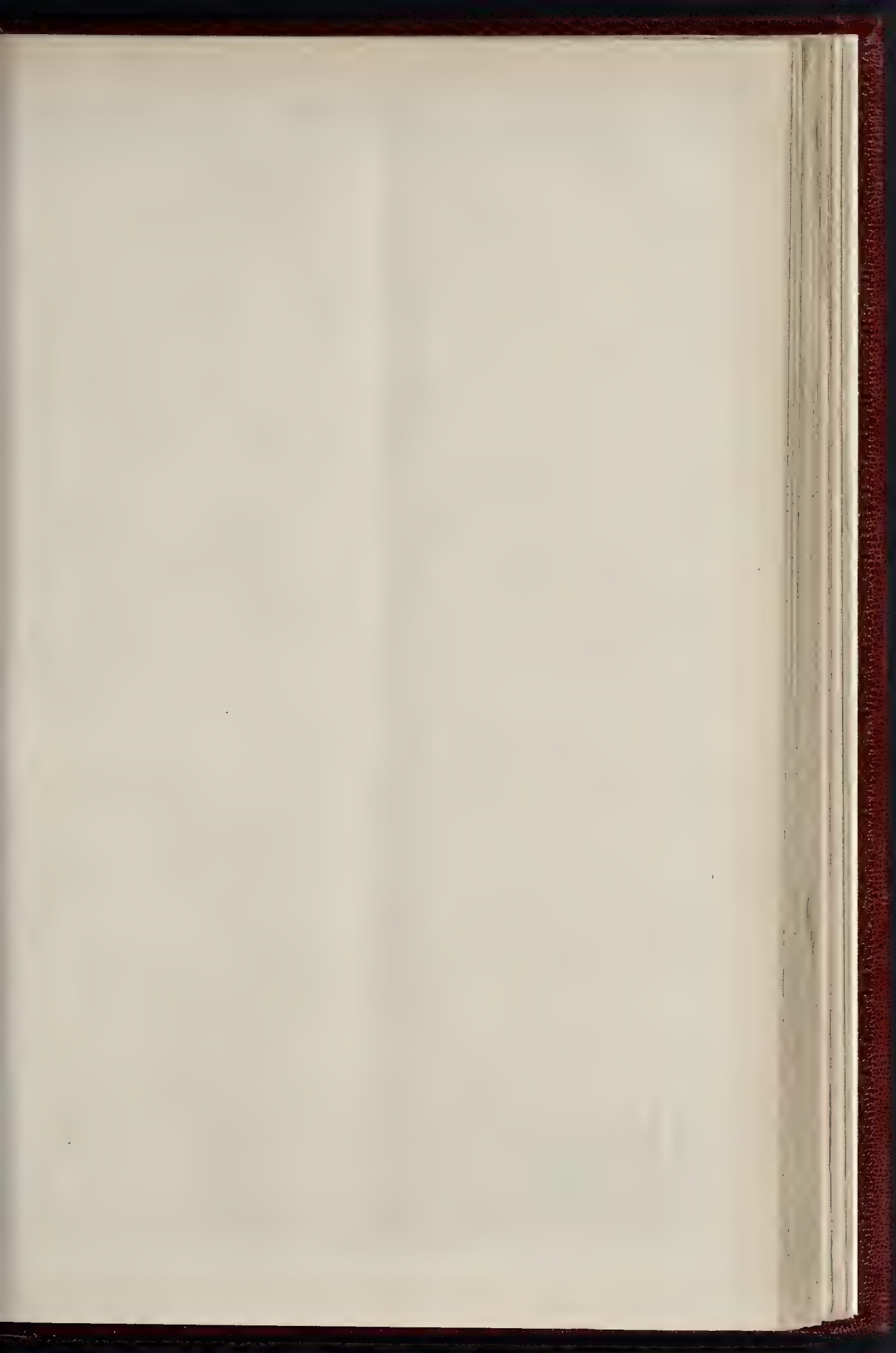
#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS: THE ANNUAL REPORT.

THE Annual Report of the Council of the Institute, as approved and adopted at the annual general meeting held on the 6th inst., contains the following passages:—

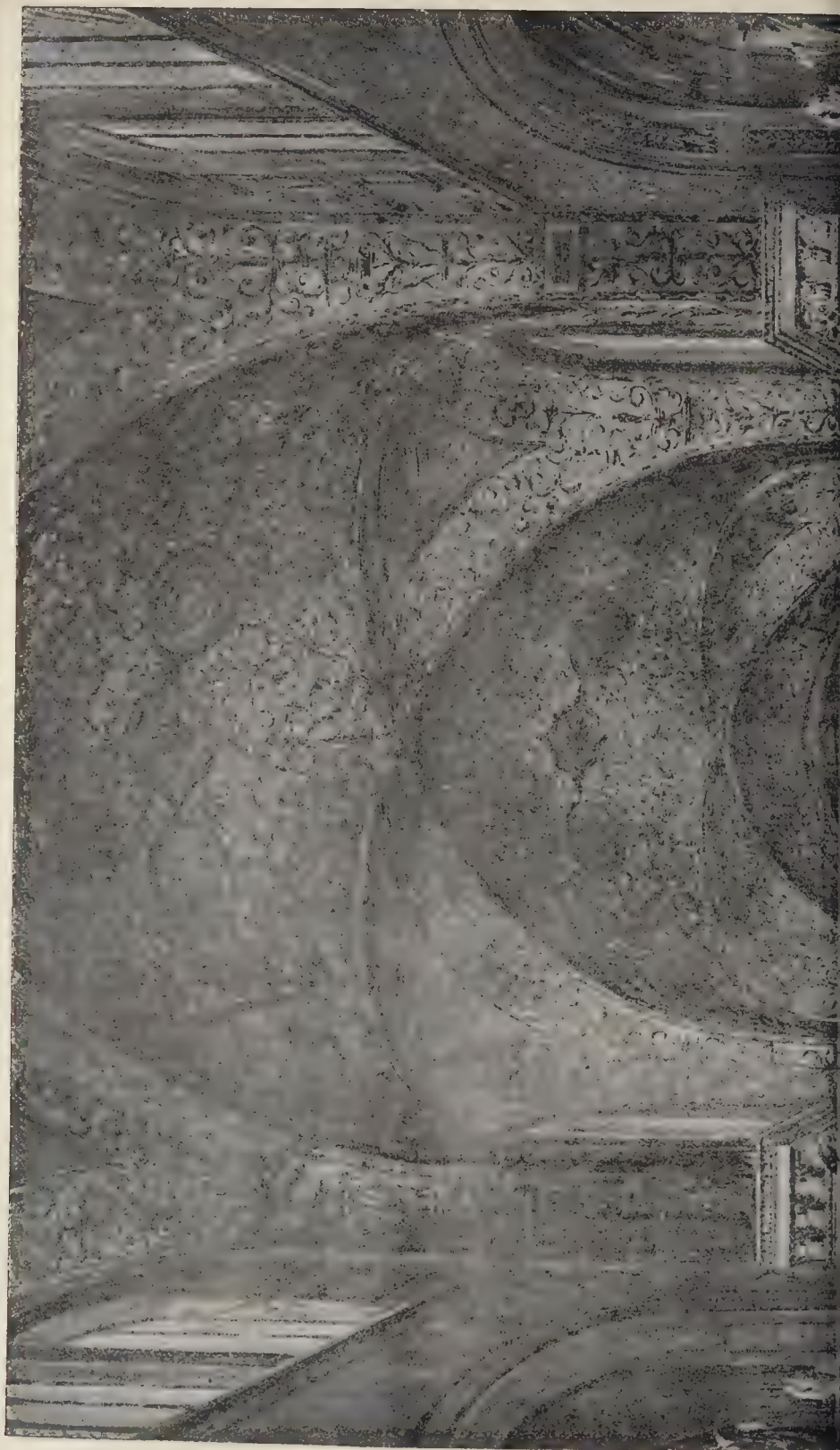
"Almost the first work of your Council, elected at the annual meeting of 1888, was to submit for the consideration of the general body of members the draft Bylaws prepared under the provisions of the Supplemental Charter. This draft was adopted, with some amendments, on the 14th May, 1888, and was confirmed on the 28th of the same month, when it was ordered to be submitted to the Lords of the Privy Council. But the Lord President was advised that the Bylaws could not be approved until some definition of the character of the Examination which Associates have to pass, and the terms and conditions of competition for certain prizes, had been inserted therein. These additions having been made and submitted, an intimation was received that the Bylaws, as altered, might properly be approved, so soon as the corporate seal of the Institute had been affixed thereto. The additions and amendments were consequently submitted to a special general meeting on the 14th January, 1889, when the Bylaws, as added to and amended, were adopted; and your Council having been authorised to sign and seal the same, their lordships' approval was given on the 7th February, 1889, and announced on the 25th by a communication received on the 18th of that month.

The attention of your Council having been called to the evidence taken by the Metropolitan Board of Works Inquiry Commission, affecting members of the Institute, copies of that evidence were officially asked for and obtained from the Royal Commission. An extraordinary meeting of your Council, convened by the President, was held, and action was at once taken in regard to five members of the Institute, with the result that, at the opening





THE BUILDER, MAY 18, 1882.



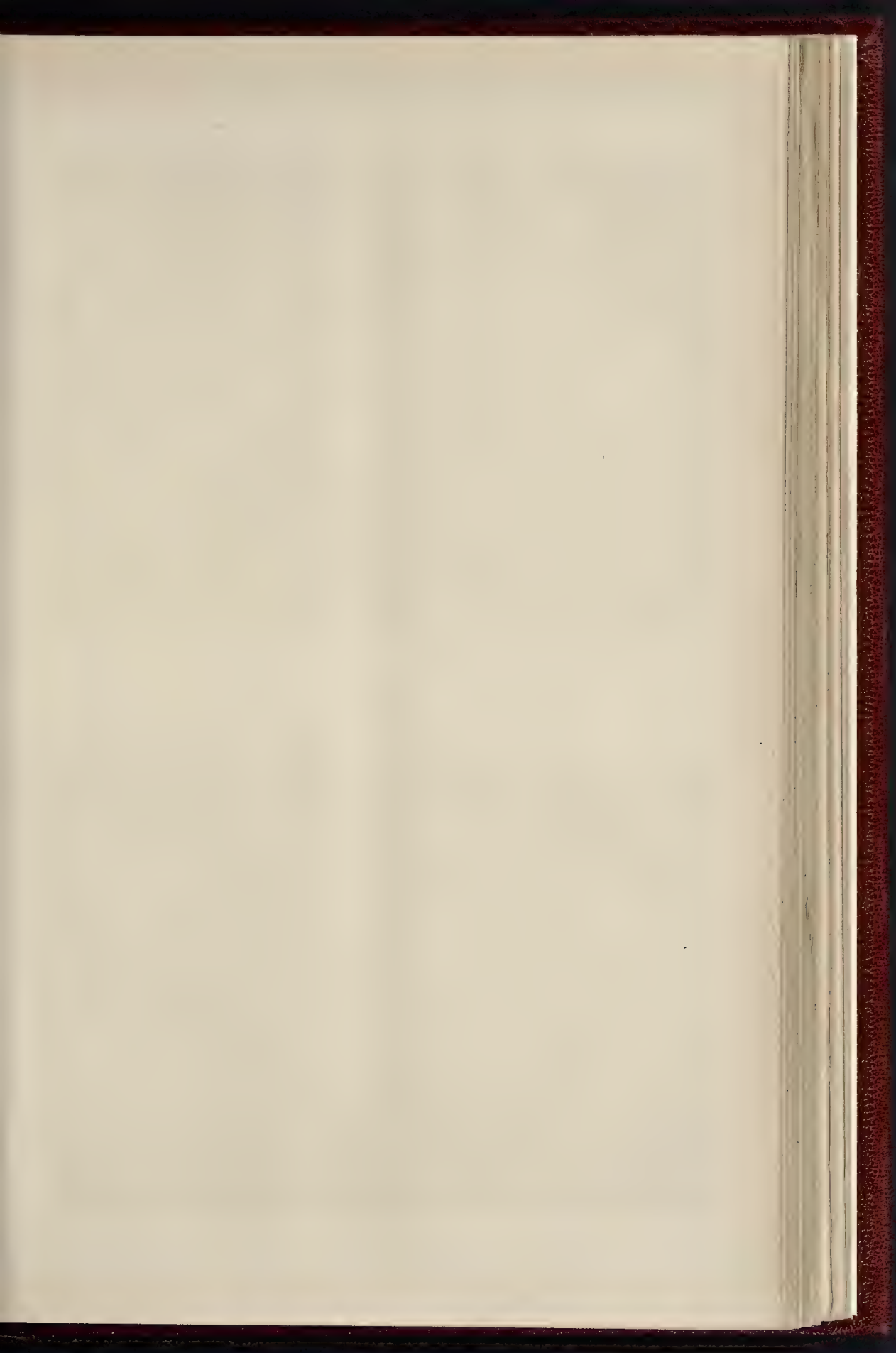


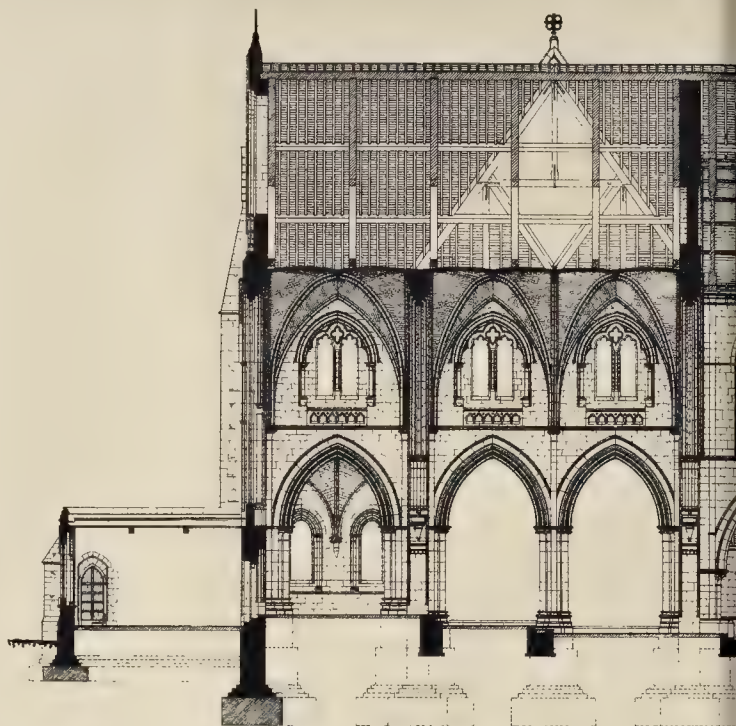


RESTORATION OF THERMARIUM OF CARACALLA'S THERME, ROME.  
*From a Drawing by Professor Atchison, A.R.A.*





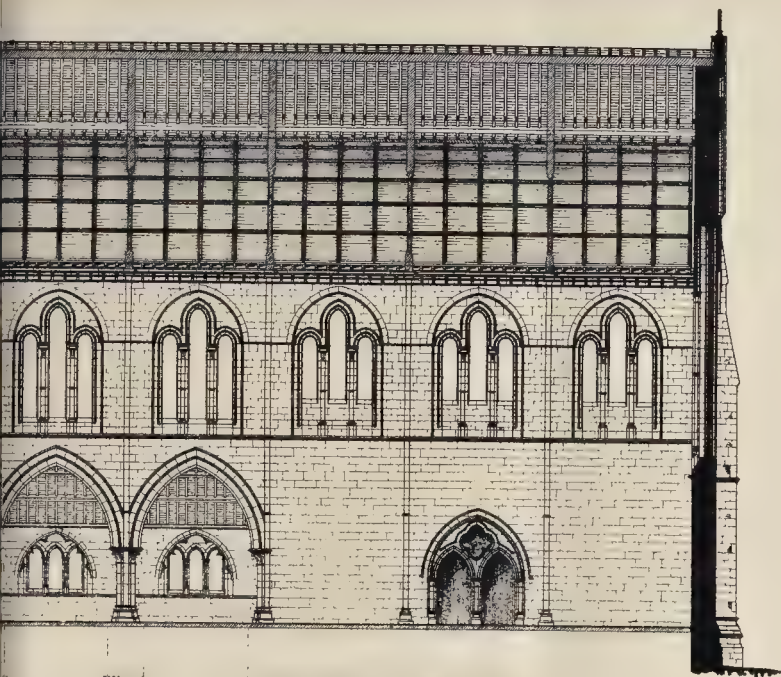




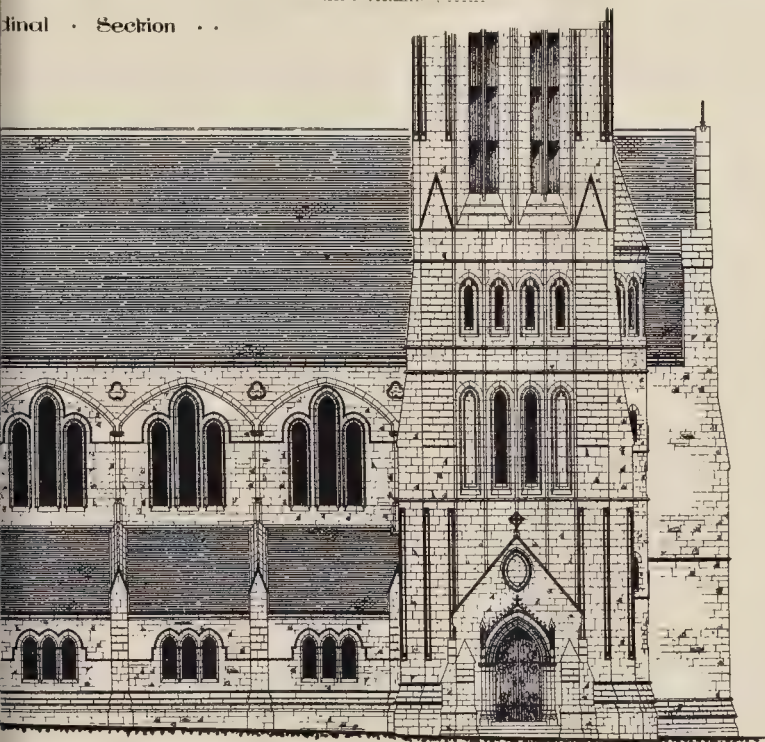
Scale of Feet . . .







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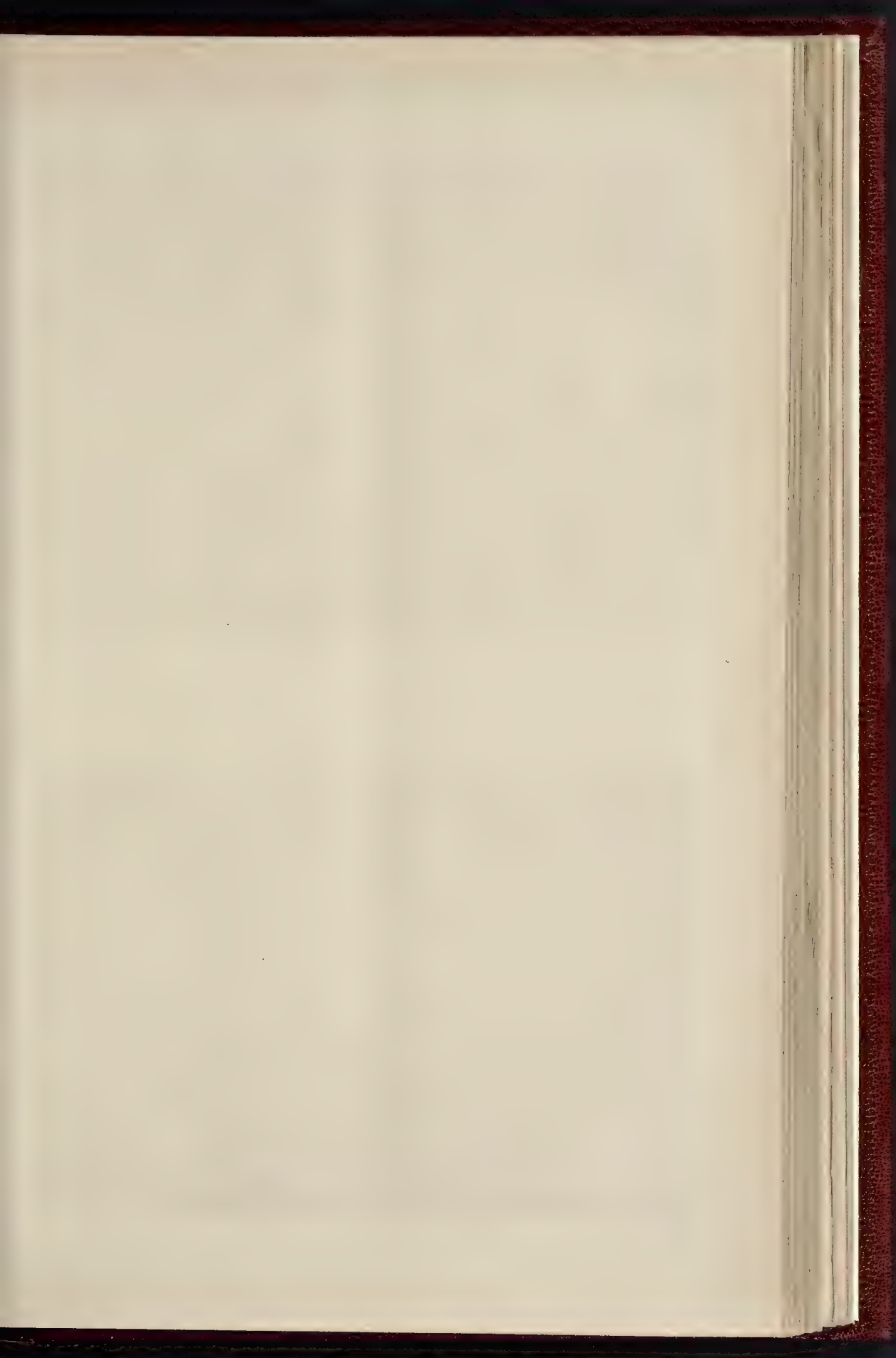


. Elevation . .

PHOTO LITHO. SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON, E.C.







THE BUILDER, MAY 18, 1906



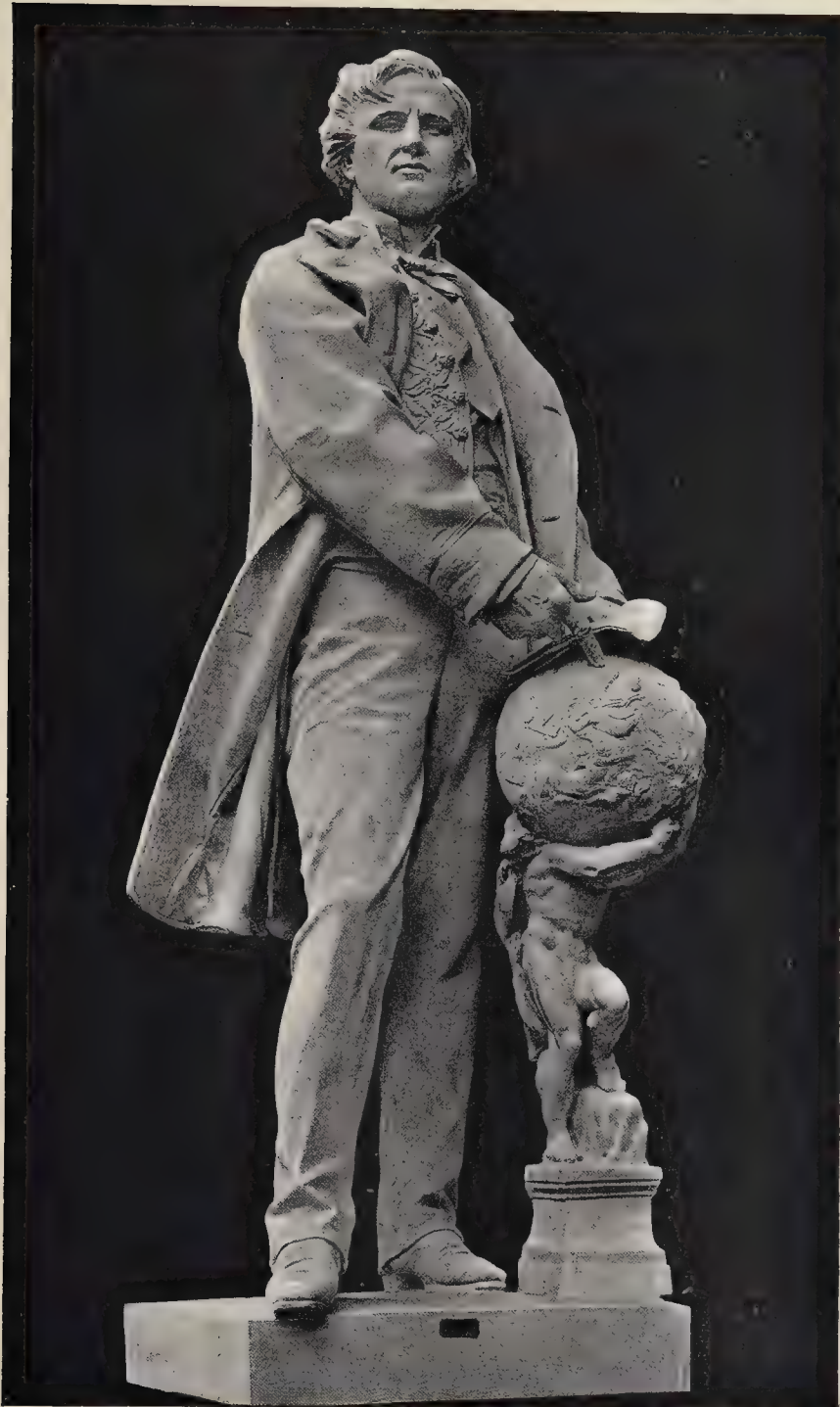
"MOTHERLESS."



"HEQUEATHED BY BLEEDING SIRE TO SON."

The Phototype Co., 393, Strand, London.





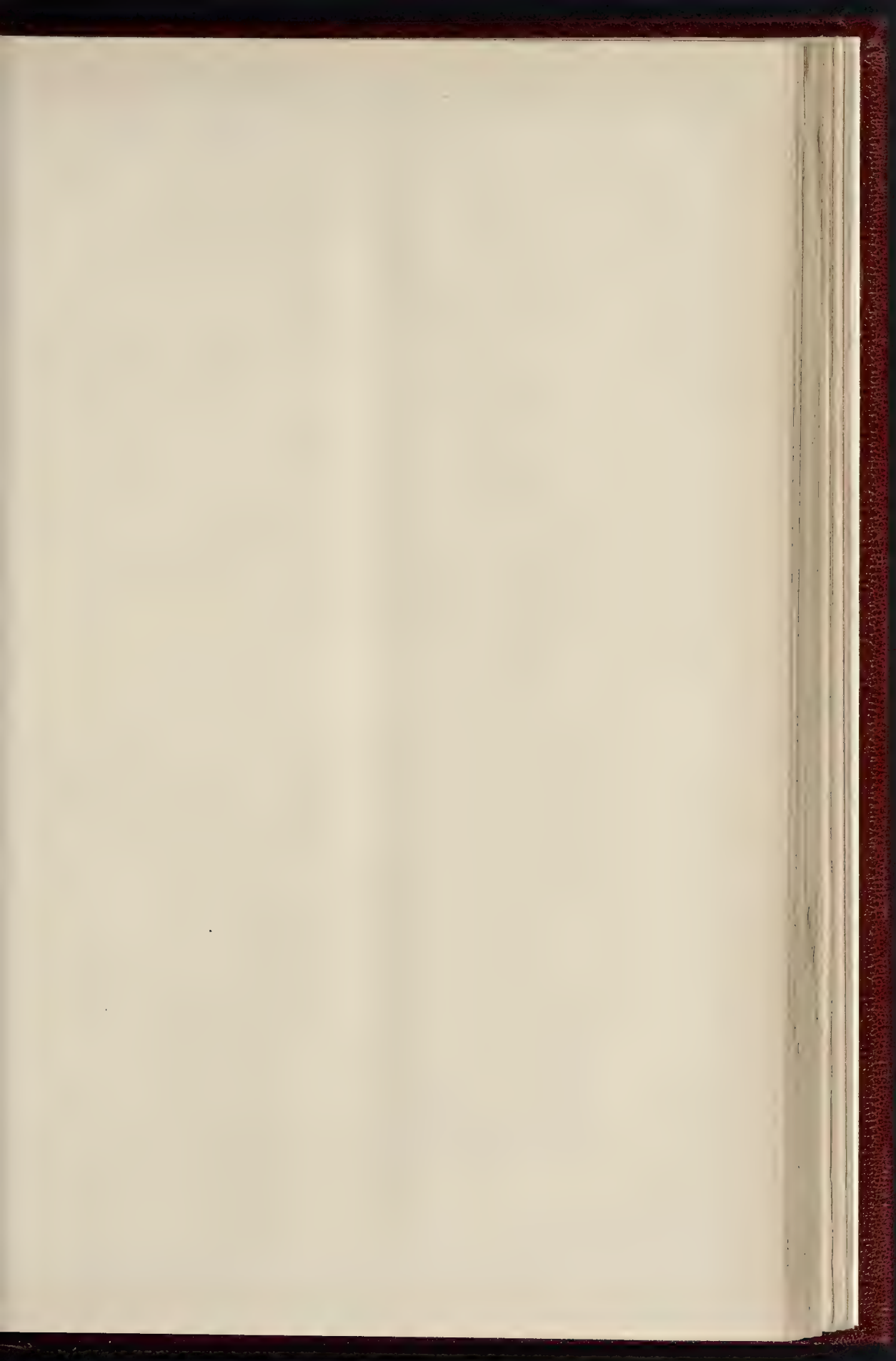
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MEMORIAL STATUE TO LE VERRIER, PARIS.

M. CHAPU, SCULPTOR.





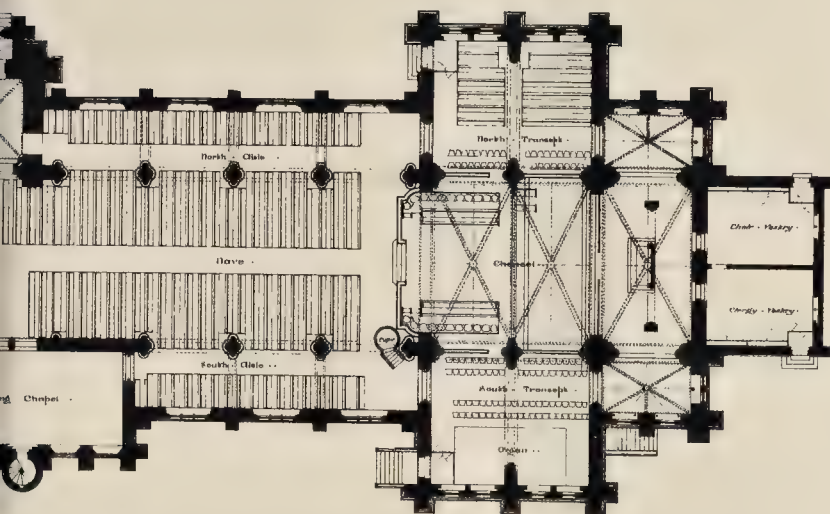




West Elevation .



Scale of Feet to Plan . .



Ground • Plan • •



East · Elevation . .

Arthur · Edmund · Skreek ·  
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HUR E. STREET, M.A., ARCHITECT.





meeting of the present session, an announcement was made from the Chair of the expulsion of one Fellow. In the case of another Fellow resignation had intervened; and with regard to the others (two Fellows and one Associate) your Council addressed to all three respectively a censure upon their conduct as disclosed by the evidence taken by the Royal Commission.

Prior to the close of last session your Council issued to all members of the Institute, to archaeological and other societies, and to persons likely to be interested in the subject, a revised edition of the paper which was first published in 1865, and entitled 'General Advice to Promoters of the Restoration of Ancient Buildings' and 'Hints to Workmen engaged on the Repairs and Restoration of Ancient Buildings.' In the re-issue the original document was divided into two, and made uniform with other similar Institute Papers.

About the same period your Council addressed a letter to the Right Hon. David Plunket, M.P., First Commissioner of Works, on the subject of the retention of the present Admiralty, and the addition to it of new buildings on the lines of the old building, according to a scheme then just submitted to Parliament and known as the 'Admiralty Buildings Extension Scheme,' and against the adoption of which your Council respectfully recorded their protest, on the grounds mainly that it would involve the perpetuating of evils inherent in an old and perishing structure, and that the application of public money for such a purpose would be unwise and unjustifiable. Your Council ventured to hope that any vote that the House of Commons might be asked for in respect of the scheme might be deferred, and they called the attention of the First Commissioner to the memorial which the Institute had submitted in 1886 to his predecessor, the Right Hon. the Earl of Morley, and to the plan accompanying it, whereby the approaches to Whitehall and to the Mall might be widened, and the general effect, from an architectural point of view, considerably improved. The official scheme, however, was virtually adopted by the House of Commons, and the only concession obtained was a statement by Mr. Plunket that the Government intended to extend the Mall to Charing Cross.

A Bill proposing to amend the Metropolitan Management Act, 1855, the Metropolitan Building Act, 1855, and the Acts amending the same respectively, prepared at the instance of the Metropolitan Board of Works, was introduced into the House of Commons last session, and a statement of objections against some of its provisions, forwarded by your Council to all the Metropolitan Members of Parliament, was published in 'The Journal of Proceedings,' but the Bill did not reach a second reading.

The new Local Government Act not having made any provision for the proper examination of technical officers employed by the urban and rural authorities, your Council, while the Bill was under consideration both in the House of Commons and in the House of Lords, called attention to this defect, but without success. In a letter addressed on the 3rd August, 1888, to Lord Balfour of Burleigh, who had charge of the Bill in the Upper House, the President reiterated a part of the arguments used in the letters on this subject previously addressed to the Local Government Board, and suggested the addition to the Bill of a clause to the following effect:—

Except where the Local Government Board for reasons brought to its notice may see fit in particular cases to allow, no person shall hereafter be appointed architect, engineer, surveyor, or building inspector for any district, or the deputy of any such officer, unless he holds a 'certificate of competency' to fill such office granted after examination by the Royal Institute of British Architects, or the Institution of Civil Engineers, or the Surveyors' Institution; or unless he has held a similar office, during three consecutive years for a district or combination of districts, with a population according to the last census of not less than 20,000.

At the Statutory Examination held in October, 1888, when eight candidates presented themselves, two were granted Certificates of Competency to act as District Surveyor in London. At the second half-yearly Examination, held on the 25th and 26th April, 1889, fourteen candidates presented themselves, of whom four were granted Certificates of Competency to act as District Surveyor in London: . . .

Three Examinations in Architecture have been held during the official year, one in Liverpool and two in London. At the first of the London Examinations, held in November, 1888, thirty-one out of thirty-eight who presented them-

selves passed; and the remaining seven were relegated to their studies for one year. At the second of the London Examinations, forty-five out of fifty-nine who presented themselves passed; and of the remaining fourteen, one did not pass, while thirteen were relegated to their studies. At the Liverpool Examination, which was conducted by a Board appointed by the Liverpool Architectural Society, and consisting entirely of Fellows of the Institute, nine applicants presented themselves, of whom six passed, and three were relegated to their studies. The number of applicants for admission to the three Examinations was 106, of whom eighty-two have been declared qualified for candidature as Associates; and your Council would fail in their duty if they did not express their cordial appreciation of the great services rendered by the examiners, involving an enormous devotion of time and labour on the part of those who accept these honorary posts. Your Council are greatly indebted to the Liverpool Board, and especially to Mr. Alfred Culshaw, who acted throughout as honorary secretary to the Board. Nor would this reference be complete without recognising the zeal and ability with which the Chairman of the London Board has from the commencement conducted the oral portion of the Examination, wherever it has been held,—this year at Liverpool, and previously at Manchester, Leeds, and Glasgow.

By the seventeenth section of the Bylaws any non-Metropolitan Architectural Society, consisting in whole or in part of professional members, may under certain conditions be allied with the Royal Institute; and a letter was consequently addressed, as early as last May, to all such Societies within the United Kingdom which were in correspondence with the Institute, asking for information and particulars in respect of which they might claim such alliance. Their replies, and the rules or bylaws and the lists of members of the several Societies forwarded therewith, having been examined and considered, your Council recommended as eligible for alliance the following Societies, viz.—(1) The Sheffield Society of Architects and Surveyors; (2) The Leicester and Leicestershire Society of Architects; (3) The Manchester Society of Architects; (4) The Glasgow Institute of Architects; (5) The Northern Architectural Association; (6) The Bristol Society of Architects; (7) The Nottingham Architectural Society; (8) The Royal Institute of the Architects of Ireland; (9) The Liverpool Architectural Society. This recommendation, having been submitted to a special general meeting on April 8, 1889, was approved and adopted; and the nine Allied Societies were at once communicated with, in order that their Presidents, if Fellows of the Institute, might be nominated for seats on the Council, with the result that seven of the nine will be represented on the Council for the ensuing year of office.

At the same meeting, the Report of the Education Committee, as approved by your Council, was submitted for consideration, and adopted. Furthermore, your Council were requested to prepare the detailed particulars and conditions necessary for developing and carrying out the scheme; and also to communicate with the Allied Societies, in order to secure their effective co-operation in so developing and carrying it out.

This scheme, it should be added, can only be rendered successful by the hearty and loyal co-operation of every member of the Institute; and your Council would urge all members to do their utmost not only to bring forward their pupils for the respective stages of examination, but also to induce the advanced pupils to enter for the final Examination without delay. The Allied Societies, it is hoped, will immediately proceed to constitute themselves 'centres,' and to organise the requisite measures for making the scheme known to architectural students in their respective localities.

The Royal Gold Medal for the promotion of Architecture was presented, in June, 1888, to Baron von Hansen, of Vienna, for his works as an architect. At the meeting, which was attended by the Chevalier von Krapf, the Austro-Hungarian Consul, on behalf of the Baron, the President delivered an address, in which he expressed the admiration felt for the elevated character and refinement of the Royal Gold Medallist's works, and a hope that he might live for many years to add to the beauty and fame of Vienna and of that other and older city of his adoption, Athens. The Medal for the current year has been awarded to Sir O. T. Newton, K.C.B., Antiquary to the Royal

Academy of Arts, for his works as a man of science and letters; and, the royal sanction having been received, the Medal will be presented at the closing meeting of the present session.

The public presentation of prizes, instead of, as in previous years, being deferred until the end of the session, took place on Jan. 28, 1889, at an ordinary meeting, in which the business of the evening was introduced by an address to students delivered by the President,—a happy innovation, and a proceeding which henceforth, it may be hoped, will be of annual occurrence. . . .

During the twelve months elapsed from April 1, 1888, to March 31, 1889, the additions to the Library amounted to 191 volumes and 118 pamphlets, and to the Loan Collection 93 volumes and 21 pamphlets; exclusive of Parliamentary papers, periodicals, reports and Transactions of Societies, parts of works issued in a serial form not yet completed, and trade-lists. The number of volumes presented to the Library was 167, and to the Loan Collection 68. Of pamphlets, 101 were presented to the Library and 20 to the Loan Collection. The foregoing enumeration includes the books of the Botham bequest, omitted from last year's return, in consequence of the arrangements respecting them being then incomplete. . . . The works purchased comprise 34 volumes and 17 pamphlets for the Library, and 25 volumes and one pamphlet for the Loan Collection. The want of self-accommodation, referred to in last year's Report, was partly met by the erection last summer of some new book-cases in the Arbitration-room. These new cases have enabled the Library Management Committee to adopt a suggestion made by some members a short time since,—to appropriate temporarily two or three cases to a certain number of books of reference for easy access by readers.

The attendance of readers in the Library from April 1, 1888, to March 31, 1889, numbered 3,306 (last year 3,288). . . .

The Art Standing Committee report that since the last election their work has been continued under three main heads:—(1) The Conservation of Ancient Monuments; (2) Public Improvements; (3) Exhibitions of Architectural Drawings and Photographs. With regard to the first, the original paper of 'General Advice to Promoters of Restorations' was considered,—a sub-committee having revised the document, making a few additions thereto, with the valuable assistance of Mr. Ewan Christian, Mr. J. L. Pearson, R.A., and Mr. A. W. Blomfield, A.R.A. Certain proposed alterations to Barfreston Church have been also considered in consultation with the architect in charge of the work; and an earnest appeal was made against the threatened destruction of two fine Tudor houses in North-street, Exeter. Last, but not least, the condition of the Church of St. Mary-le-Strand, and the attempt made for its removal, have engaged the zealous attention of the Committee, more particularly under the head of public improvements. They have long had under consideration various suggestions for improving the roadway while retaining the church, and there is ground for hope that the steps taken to ascertain what is actually proposed by the would-be destroyers of the church may result in a modification of their scheme. In view of the agitation for the removal of the Church of St. Mary-le-Strand, which has been promoted by some of the residents in the Strand, on the alleged ground that it constitutes an obstruction to the public traffic, your Council have done all in their power to preserve so unique and beautiful an example of the architecture of the last century; and have addressed a letter to the London County Council on behalf of the Institute, showing from incontrovertible facts that the church does not obstruct, but rather facilitates the traffic, and that to remove it would be an act of vandalism. The threatened encroachments upon the frontage-line of the Marylebone-road, the question of the triangular plot of land behind the National Gallery, the height of new buildings at Albert-gate and Queen Anne's-gate, have also been before the Art Standing Committee, and recommendations respecting them made to your Council. In the matter of exhibitions, the Committee concluded their work for Melbourne at the beginning of the current official year, and the Exhibition about to be opened in Paris has since engaged their attention. On their recommendation your Council appointed a Committee of Selection, on which some architects not members of the Institute



accepted invitations to sit, together with members resident in the provinces as well as London; and they have succeeded in obtaining a large number of drawings and photographs representing the progress of British Architecture during the past ten years, which have been sent to Paris at the cost of the fund raised by the Fine Art Committee of the British Section, of which Sir Frederic Leighton, P.R.A., is the Chairman,—the Institute having been accredited as the channel through which architectural drawings intended for the Paris Exhibition would alone be received by the authorities.

The Practice Standing Committee report that they have devoted a great deal of time to the paper of 'Conditions of Builders' Contracts.' They have also been engaged in the preparation of Forms of Articles of Pupilage, which they have submitted to your Council. In these forms an attempt has been made to induce the master or principal to allow his pupil the necessary time during his articles to prepare for the several Examinations which will ultimately qualify him for candidature as Associate; and now that the Institute has approved and adopted the scheme of progressive examinations, it is hoped that every member will encourage his pupils to become Probationers, then Students, and afterwards Associates of the Institute. A Bill put forward by the Metropolitan Board of Works, and previously referred to, for the Amendment of the Metropolis Building Acts, another Bill to restrict the Height of Buildings in the Metropolis, and several questions in professional practice, have been considered by the Practice Standing Committee, and duly reported on to your Council.

The Science Standing Committee report that, on the resumption of the discussion on theatre construction and arrangement, it was decided to extend the inquiry to public buildings generally, under certain specified headings; for which purpose the Hon. Secretaries of the Committee have already obtained information from many provincial towns and from the chief continental cities. With reference to the subject of 'Light and Air,' the Committee report that their first business, on the transfer of this section of work to them, was to prepare a digest of the many papers and notes which had been acquired by their predecessors, a duty undertaken by the Vice-Chairman, Professor T. Roger Smith.

A full and interesting account of the work done by the Competitions Committee since the presentation of the Memorial of 1880, by the late Mr. Street, was printed in the "Journal" on February 14, 1889, and an analysis of competitions held during the two years 1886 and 1887 was given with it.

The particulars given in last year's Report of the steady increase in the numbers for admission were so full that it would be a matter of supererogation to enter into detail in this Report. During the official year now terminating, sixty-eight Fellows (twenty-six of whom were previously Associates) and seventy-six Associates have been elected. The number of Fellows is 497, and the number of Associates 727, making a total of 1,224 professional members, as against 1,145 last year.

Since the last annual meeting the decease of fourteen professional members has to be recorded. Amongst the Fellows, Messrs. E. N. Clifton, John Griffith, C. F. Hansom (Bristol), Pearson B. Hayward (Exeter), William Hill (Leeds), Henry J. Paul (Manchester and London), O. Richard Pink (Winchester), R. P. Pullan, and James Salmon (Glasgow). Amongst the Associates, Messrs. John Cowell, John Cundall (Leamington), E. F. Dawson (Gibraltar), George Sparrow, and T. Heygate Vernon. Two Hon. Associates have died,—namely, Lord Seaton and Mr. Frank Holl, R.A.; and one distinguished Hon. Member, Mr. T. Gambier Parry.

The Revenue Account and Balance-sheet of Ordinary Funds for the year ended December 31, 1888, signed by the Auditors, are submitted with the report. Authority to sell 1,000,000 stock for the purpose of meeting extraordinary expenditure, during 1887 and last year, has been availed of to the extent only of 776, and the loan of 1,000,000 obtained in 1887 from Messrs. Herries, Farquhar, & Co. has been paid back in full.

Messrs. Strode & Co. have opened new branch West-end show-rooms at 188, Piccadilly.

#### ARCHITECTURAL ASSOCIATION VISITS: THE IMPERIAL INSTITUTE.

IN spite of the unfavourable weather, the most numerously attended visit of this season was made on Saturday last to the buildings of the new Imperial Institute, now in course of erection from the designs of Mr. T. E. Colcott.

The visitors were met by the clerk of the works, who first showed them the drawings, and enabled them to study and appreciate the careful and refined character of the detail.

The workshops and masons' sheds were next inspected, with the stoneworking machinery for sawing, moulding, planing, rubbing, &c. Much interest was shown in this plant, which has been fitted up by the contractors, Messrs. Mowlem & Co., in a very complete manner. The particularly sharp and clean lines of the machine-worked mouldings in straight lengths were especially noticed. Circular work, mitres, and other finishings are, of course, worked by hand. The stone used for the works is Portland externally, and principally Hopton Wood internally.

A tour through the buildings was then made under the guidance of the clerk of the works, in order that the members might obtain some idea of the foundation works and the iron construction.

The walls being as yet only up to the first floor level, the artistic qualities of the work are hardly in evidence, and hopes were expressed by many of the members that further visits will be made when the building is in a more advanced state.

#### THE CHURCH OF ST. MARY-LE-STRAND.

THE following letter and resolution were laid before the Improvement Committee of the London County Council on Wednesday, by a deputation including among their number Mr. Walter Crane, Mr. T. G. Jackson, Mr. Arthur E. Street, Mr. Selwyn Image, Mr. Mathew Anderson, and Mr. Herbert P. Horne:—

"SIR,—The controversy, which has for some time raged around the Church of St. Mary-le-Strand, has now reached a very serious crisis. Efforts have been made to raise the funds necessary to put the building in proper repair, and at the present time one half of the amount required has been subscribed or promised; yet a determined attempt, backed by the support of one of the most influential of the daily papers, has been commenced to sweep it, and after St. Clement Danes, clean away. Those who are vigorously forcing on this action, justify it on two grounds: first, that St. Mary's is an obstacle to traffic; secondly, that it is a bad piece of art. At the same time they are ready to confess that were it a good piece of art, they would be quite prepared to let it stand, in spite of its practical obstructiveness.

Now it is hard to believe that the advocates of this measure have been at the pains to come at a true artistic judgment. We, the signatories to this letter, hold St. Mary's to be a most interesting and beautiful specimen of a particular and fine kind of architecture; and in this opinion we are confident that we should have the concurrence of the vast majority of those who are best able to give a sound artistic opinion on the question. We, therefore, beg to make this public protest against the proposed demolition of the church, considering that the loss of it would be the loss of one of the most beautiful buildings in London; from which we trust that the finer sense of the community will save us.—We remain, sir, faithfully yours,

GEO. AITCHISON, A.R.A. JOHN MORLEY, M.P.  
L. ALMA-TADEMA, R.A. WILLIAM MORRIS.  
JOHN F. BENTLEY. C. KEAN PAUL.  
G. F. BODLEY, A.R.A. JOHN L. PEARSON, R.A.  
JAMES BROOKS. ED. J. POYNTER, R.A.  
FORD MADDOX BROWN. W. E. RICHMOND, A.R.A.  
ROBERT BROWNING. CHRISTINA ROSSETTI.  
E. BURNES-JONES, A.R.A. JOHN D. SEDDING.  
WALTER CRANE. ARTHUR EDM. STREET.  
AUSTIN DOBSON. R. NORMAN SHAW, R.A.  
T. GARNER. FREDERIC SHIELDS.  
ALP. GILBERT, A.R.A. H. THORNTON, R.A.  
HERBERT F. HORNE. HERMANN VESIN.  
S. IMAGE. ALP. WATERHOUSE, R.A.  
T. G. JACKSON. G. F. WATTS, R.A.  
FRED. LEIGHTON, P.R.A. PHILIP WEBB.  
J. E. MILLAIS, R.A."

In addition to this letter we would also ask your attention to a resolution passed at the ordinary meeting of the Art-Workers' Guild, held at Barnard's Inn Hall, on Friday, May 3, 1889.

Proposed by T. G. Jackson, M.A., seconded by J. J. Micklethwaite, F.S.A.

"That the Art-Workers' Guild desire respectfully to present to the London County Council their

\* The memorialists have certainly over-estimated the "influence" of the paper referred to, among educated people at all events.—Ed.

unanimous desire, that any scheme for improving the Strand, with reference to the convenience of locomotion, may provide for the retention of the churches of St. Mary-le-Strand and St. Clement Danes; which are in the opinion of the Guild, and they believe in that of the majority of artists, among the greatest architectural ornaments of London."

WALTER CRANE, Master.  
WM. C. MARSHALL, Hon. Treasurer.  
MERVYN MACARTNEY, } Hon. Secretaries.  
GERALD C. HORSLEY, }

#### THE MADEIRA-ROAD IMPROVEMENT, BRIGHTON.

MR. G. R. ANDREWS, C.E., the newly-appointed Borough Surveyor of Brighton, sends us the following description of the works now being carried out on the Madeira-road, Brighton. The Madeira-road, as many of our readers will remember, is the road which runs alongside the beach eastward of the Aquarium, below the cliff on the top of which is Marine Parade:—

"There will be a raised terrace, 1,304 ft. in length and 25 ft. in width, extending from the steps opposite the Royal-crescent to the steps opposite Paston-place, forming a raised promenade between the Esplanade on the Marine Parade and the Madeira-road, and protected on the outer edge by a strong fence and handrail. This terrace will be accessible either from the Marine Parade or the Madeira-road by the Royal-crescent or the Paston-place steps, or by the hydraulic lift, which will be placed opposite the centre of Marine-square, and for the use of which a nominal charge will be made. By means of this lift visitors and others will be able to save the fatigue of climbing the steps, or the more prolonged ascent of the Duke's mound, and invalids in hand-chairs may be lowered from the Marine Parade to the raised terrace or the Madeira-road, or vice-versa. A continuous seat is also provided on this raised terrace, next the wall, extending the whole length.

In the centre, and underneath the raised terrace, near the lift, will be a spacious shelter-hall, with well-appointed lavatories on either hand,—on one side for ladies, and on the other for gentlemen. Adjoining the shelter-hall, and opening therefrom, are two reading-rooms, each 56 ft. by 24 ft., and beyond these will be covered walks 15 ft. in width, extending the remainder of the length. The raised promenade is supported on cast-iron columns and wrought-iron girders, with ornamental spandrels; the roof or ceiling to be of concrete, with asphalt walk on the top. The following materials, &c., will be used in executing these works, viz.:—About 5,600 cubic yards of excavation; about 2,000 cubic yards of concrete; 300,000 bricks; and 600 tons iron.

The scheme was designed by my predecessor, Mr. Philip C. Lockwood, C.E.; the contractors are Messrs. J. Longley & Co., of Crawley,—the contract sum being 18,975*l.*, and the time for completion the 30th of September next.

When these works are completed they will, doubtless, be found a great public accommodation in hot, wet, and cold weather, protected as the sheltered walks will be from the sun and rain, and also from the north, north-east, and north-west winds."

#### THE POSSIBILITIES OF ARCHITECTURAL EXAMINATION.

It has often been urged, in reference to examinations instituted as tests of architectural proficiency, that the real essence of architecture, the power of design and of æsthetic appreciation, is a subject that cannot be tested by examination; and we are inclined to think this is, on the whole, true; at all events, that the difficulty of discriminating fairly and fully as to artistic power, by any form of examination, would prove almost insuperable, partly from the difficulty of getting any common consent as to the standard of appreciation to be adopted, from either examiners or examinees. Knowledge of building as a science can be tested with precision, and those who know that they have only attained the rudiments of such knowledge will readily defer to the superior knowledge acquired by long years of study and experience. But in the case of artistic power there is no such easily established standard of greater or lesser acquirement. Nevertheless the remarks made by Mr. A. B. Pite at the recent discussion at the Institute on the subject of education, are so well



put, and so interesting as the expression of the feeling of one of the younger members of the profession in regard to the influence of examination from the artistic point of view, that we have pleasure in reprinting them here, as they are given in the last issue of the R.I.B.A. Journal:—

"There can be no doubt that the Board of Examiners and the Council are to be congratulated upon the extreme success of the examination for Associateship. It is a success which I venture to say has strengthened the Institute before the country at large, and it has drawn round our ranks a fence of professional qualification which no doubt is very valuable. But as we look back upon a period of work, may we not ask, what has been the effect of examination upon architecture as a fine art? What has been the effect of the perforce study of the antiquarian department of the programme? and what has been the result, from the art point of view, of forcing our students into archaeological rather than into inventive grooves? Has this Institute really considered the result of the examination upon the art of architecture? I venture to say this is one of our first duties. If a national style is to be evolved at all, it ought to be evolved from this body. It ought to play a very important part in this examination; but I venture to suggest that it is very necessary, and should receive our consideration. It is upon the detail that the artistic effect of the architect's building depends, and it should, I think, be made a prominent feature in the art section of the examination; and more than this, I think that the study of full-sized mouldings should be enforced, and an opportunity offered to students in the examination to draw mouldings full-size; but the sheets of paper at present allowed do not give them the opportunity of doing so. I think there are gentlemen here who will bear me out in saying that the study of a moulding otherwise than full size is a fallacious study, and it can have no direct bearing upon an architect's practice. It may be interesting from an archaeological and antiquarian point of view, but from a practical point of view it is useless. I find that in the course of study and preliminary work there will be a door for the introduction of carefully-studied detailed drawings; but in the examination itself will probably be cramped up into the small hours of Wednesday afternoon. Why not start the student in his examination with his plan, follow him up with his elevation, let him then go into details, and work out the problems of the buildings, and then proceed to put him through the practical dissection and analysis of his building, his specification, his estimate, and so forth, to complete the design, and thus make the examination follow in a parallel line with the architect's actual practice? Inasmuch as the architect is of all things a designer, a man who has to exercise his inventive faculty, some means should be taken in this examination to test thoroughly his capacity of design. The tendency of the examination at present is to test his capacity as a copyist. Cannot something be devised, possibly by an extension of the time afforded to the designing, to allow his fancy to play in the direction of invention? I would also ask that a candidate's power of appreciating architectural beauty should be tested. Why not ask the candidate to write down the elements of beauty in a known building? Ask him to describe the impression the building produces upon him. Ask him to give his reasons for considering that building to be a beautiful building—and you will be training him in design; you will be enabling him to grasp the buildings that come under his notice in practice with a view of their being made beautiful. And may we hope, Mr. President, when another generation has passed, to see 'Classic' as against 'Perpendicular' struck out of our programme, which they now fall to the apparent exclusion of the very beautiful style of the early Renaissance?"

**A Floating Theatre.**—The St. Petersburg *Vedomosti* states that a company has been formed in that city for the building of a steamer to contain a theatre, for the purpose of performances at those towns on the Volga and other rivers where there is no theatre. The vessel is to be built on the American principle, with two decks, and will, in addition to a theatre, with sittings for 1,000 persons, contain full accommodation for the company, orchestra, &c. The tour is to be begun in June next.

#### THE SURVEYORS' INSTITUTION: PROFESSIONAL EXAMINATIONS, 1889.

The following Student Candidates have passed the Examination for the Professional Associateship:—

Bridgford, L. A., Manchester.  
Burton, P. C., Ealing.  
\*Dendy, W. C., Brompton.  
Galeworthy, V. S., Queen's Gate, S.W.  
Garrod, J. R., Surbiton Hill.  
Giddy, O. H., Staines.  
Grover, A., Stamford Hill.  
Hadley, F., Moseley, nr. Birmingham.  
Haslam, D., jun., Caversham.  
Kaye, E. P., Wakefield.  
\* Special Prize, 1889. † Institution Prizesman, 1889.

The following non-Student candidates have also passed the examination for the Professional Associateship:—

Assiter, H. G., Brixton.  
Ball, W. A., Forest-hill.  
Barnes, G. F., Chester-square.  
Bellingham, A. T., Swansea.  
\*Brown, A. M., Tring, Herts.  
Colbourne, H. J., Wool-hampton.  
Darch, J., Balham.  
Dudley, E., Chatsworth.  
Forster, W. H., Norwich.  
Grant, J., Croydon.  
Goddard, A., Leicester.  
Hardy, T., Tulse-hill.  
Head, J. G., Upper Baker-street.  
Higgins, G., Finchley.  
Mason, C. W. H., St. John's, S.E.  
Perkins, J., Edgbaston.  
Puckridge, P. M., Marlborough.  
Sampson, W., Beauchief Abbey.  
Satchell, H. A., Putney.  
Selby, F., Canonbury.  
Tyler, J. W., Upper Tooting.  
Wain, G. S., Bedford-park, W.

† Driver Prize, 1889.  
The results as regards the Fellowship Candidates will probably appear in our next issue.

#### THE LONDON COUNTY COUNCIL.

**The Housing of the Council.**—At the supplemental meeting of the London County Council, held at the offices, Spring Gardens, on Friday, the 10th inst., the adjourned discussion of the report of the Council Chamber and Offices Committee (printed in the *Builder* for April 13 last, p. 233, together with the report of the minority of that Committee) was the first business taken.

Sir Walter De Souza, the Chairman of the Committee, admitted that the accommodation to be provided by the alterations proposed by the Architect's plans, and which were estimated to cost £10,000, would only be, comparatively speaking, of a temporary nature, but they would serve for a few years, long enough for the Council to be better able to judge of their actual necessities when they came to consider the question of housing themselves and their officers all under one roof. That would ultimately be a necessity, but the Council would be acting prudently to defer so large an operation for a few years, in order that they might see how far their work would increase, as it would. If the recommendation of the Committee were adopted, it would be necessary to seek for additional premises in the immediate neighbourhood to serve as offices for such portions of their staff as would be displaced by the enlargement of the present Board-room at Spring-gardens. It was proposed to enlarge the Board-room by removing the wooden screens and galleries at each end, so as to afford sitting-room for every member of the Council. The Press Gallery it was proposed to set back and enlarge (so as to seat 45 reporters and other Press representatives) by carrying it through the wall which now exists at that end of the Board-room, the present Public Gallery being removed altogether from its existing position and located along one side of the Board-room (to the right of the Chairman) by carrying it through the wall on that side of the apartment.

In the course of the subsequent discussion, Mr. James Bell moved as an amendment that the report be referred back to the Committee for reconsideration. He contended that the proposed outlay in tinkering the Spring-gardens premises would be wasteful and disappointing. He referred to what had been done, and was being done, both in this country and in America (in Philadelphia and Chicago, for instance) in the way of providing adequate municipal buildings. Was the great city of London, he asked, to be behind any other city in the world in this respect? The London County Council wanted administrative offices on a much larger scale than they at present possessed. It was very essential that their staff and committees should be housed under one roof.

The amendment was seconded by Mr. J. Williams Benn, and after some further discussion, in the

course of which the Deputy-Chairman (Mr. Firth) and Dr. Longstaffe spoke strongly of the overcrowded state of the offices in Spring-gardens, and of the "noisome atmosphere" in which many members of the staff had to work, the amendment was lost by forty votes for to forty-two against it, and the report of the Committee was then agreed to, although the Chairman (Lord Rosebery) expressed his regret that the question had been decided by so narrow a majority. It was, however, intimated, in the course of a brief conversation which followed, that tenders would before long be invited for the work, and that when these came up the whole subject could again be raised.

**Width of New Streets.**—Mr. G. B. Holmes (Chairman of the Building Act Committee) submitted the following recommendation of the Committee:—

"That the Vestry of St. Pancras and Messrs. Clutton be informed, with reference to the application of Messrs. Clutton, for approval of a plan for widening Greenland-place, Camden-town, for carriage traffic, that although Messrs. Clutton have, at the suggestion of the Building Act Committee of the Metropolitan Board of Works, made certain alterations in their plans, the Council is unable to approve of the application, as the width of Greenland-place will still be insufficient to meet the requirements of the statute."

After a long discussion, the recommendation of the Committee was carried.

**Tenders.**—The first business after the confirmation of the minutes at the ordinary weekly meeting, held on Tuesday last, was to receive tenders for the formation of a wood-paved carriage-way and York stone foot-ways, and other works, in connexion with the widening of Coldharbour-lane, Canterbury. The tenders, as opened by the Chairman (Lord Rosebery), will be found under the heading "Tenders" in this week's *Builder*.

**The Engineer's Department.**—The Report of the Standing Committee, brought up by Sir John Lubbock, the Vice-Chairman of the Council, contained the following paragraph:—"On March 12, the attention of the Provisional Council was called by the Main Drainage Committee to the fact that the Chief Engineer of the Metropolitan Board, and one of the Assistant Engineers, had resigned their offices, and that, moreover, several of the principal assistants had sent in their resignations. The Committee expressed the opinion that the Council should take into consideration as early as possible the question of filling these vacancies; and the Provisional Council approved the report. Sub-committees appointed by your Committee are, as has already been stated, inquiring into the staff of the various departments of the Council's service; and the Sub-committee which is inquiring into the engineering staff is of opinion that it is desirable for the Council to proceed as early as possible to appoint a Chief Engineer and also a Mechanical Engineer. Other recommendations were made by the Sub-committee, which it appears to your Committee may stand over for a time to be considered with other matters relating to the department; but it is desirable that the Council should not longer remain without a Chief Engineer and a Mechanical Engineer. The last-mentioned officer, your Committee may mention, would be directly responsible, under the Chief Engineer, for the whole of the machinery belonging to the Council and its economical working. The recommendations of your Committee are as follow:—

"That a Chief Engineer be appointed, at a salary of £1,600 a year, and a Mechanical Engineer, at a salary of £200 a year; that each of them do hold his office during the pleasure of the Council, that he be required to give his whole time to the duties of his office, and be not allowed to take any private practice; and that the appointments be, in other respects, subject to the conditions which have been already laid down by the Council with regard to all appointments made in its service."

"That advertisements be issued inviting applications for the two appointments, and that the applications, when received, do stand referred to the Standing Committee with instructions to select (after conference, if necessary, with other Committees concerned) and report to the Council, the persons whom it considers the most suitable for the appointments."

There was considerable discussion upon these recommendations; firstly, upon a verbal amendment in the last line of the second recommendation, to the effect that the Committee should submit to the Council the names of three candidates for each office; secondly, upon the question of the salary of the Chief Engineer; and, thirdly, upon the question whether that officer should be allowed to take pupils. Eventually the recommendations of the Committee were adopted.

**Appointment of a Medical Officer.**—The Standing Committee also reported that advertisements having been issued inviting applications for the post of Medical Officer under the conditions specified in the resolutions of the Council of March 23 last, nineteen candidates presented themselves. The Sanitary Committee and the Housing of the Working Class Committee, having examined the applications, informed the Committee that they concurred in the opinion that the most suitable candidates were Mr. Shirley F. Murphy, Dr. T. O. Duffield, and Dr. E. S. Seston. The Committee having seen these three gentlemen, and made inquiry into their respective qualifications, recommended:—

"That Mr. Shirley Forster Murphy be appointed Medical Officer of Health of the County of London, at a



salary of 1,000l. a year, the appointment to be held during the pleasure of the Council, and to be subject to the conditions set forth in the resolutions of the Council of March 26 last."

It being intimated that some members of the Council desired to vote upon all three names, the Chairman asked for a show of hands, the names of the candidates being taken alphabetically. As the result of the first show of hands, the Chairman declared Dr. Seaton to have the fewest number of votes. The final vote was then taken, with the following result:—For Dr. Dudfield, twenty-three votes; for Mr. Murphy, seventy-three votes. Mr. Murphy was therefore declared elected. Some time later on in the course of the sitting of the Council Mr. Murphy appeared on the date, and was introduced by the Chairman. He briefly returned thanks for his election, and said he hoped to be able to do good work for London.

**Enlargement of Pauper Lunatic Asylums.**—The Provisional Asylums Committee, of which Mr. P. M. Martineau is the Chairman, reported that, in compliance with the resolution of the Council, they had obtained detailed information as to the accommodation for pauper lunatics in the asylums which had been or might be transferred to the County of London. Those statistics showed that the present number of lunatics for whom asylum provision should be made by the County was rather over 10,000, and there were also about 1,000 Middlesex and Croydon patients that would probably have to be provided for in the asylums that had come, or might come, into the possession of the Council. The accommodation in the Surrey asylums at Wandsworth and Cane-hill, Coudon, which had been taken over by the Council, and in the asylums at Hanwell, Colney Hatch, and Bantstead, which might come to the Council, was only for 5,350 beds, or nearly 3,000 short of actual need. The result was that patients had to be boarded out either in other county asylums or in licensed houses. Additional expense, estimated at nearly 30,000l. per annum, was thus thrown upon the ratepayers, and that loss could only be prevented by providing further county asylums. Having regard to the present insufficient accommodation, and the gradual increase in the number of pauper lunatics, the Committee recommended:—

"(1) That the asylum for pauper lunatics at Cane-hill, Coudon, which at present contains accommodation for 1,124 patients, be enlarged so as to accommodate 2,000 patients, in accordance with the plans approved by the Secretary of State, and that it be referred to the Committee to take the necessary preliminary measures with a view to the enlargement of the asylum in accordance with the Local Government Act, 1885, and the Lunatic Asylums Act, 1853.

"(2) That, in the event of the Commissioners under the Local Government Act, 1885, apportioning the site and foundations of the proposed additional asylum for pauper lunatics at Cleybury, near Woodford, to the County of London, the Committee be authorised to take the necessary preliminary measures in accordance with the Local Government Act, 1885, and Lunatic Asylums Act, 1853, with a view to the completion of such asylum."

These recommendations were agreed to, and after the transaction of a great deal more business, the Council adjourned, after sitting more than four hours.

#### IMPORTANT ARBITRATION CASE.

KIRK & RANDALL v. THE EAST AND WEST INDIA DOCK COMPANY.

In the Court of Appeal last week, Mr. Justice Denman delivered the considered judgment of himself and Mr. Justice Stephen in this important case. The facts of the case have already been stated in the *Builder*. It was a motion on the part of the dock company to set aside the award of Sir Frederick Bramwell in favour of the contractors in this great case, perhaps the largest arbitration case which has yet come before the Courts, the award being for the sum of 165,000l. The contract was for the construction of the new docks at Tilbury. The main part of the work (excavation) was to be at a certain rate per cubic yard. The contractors found that the soil was not firm so that when excavated the sides would stand, but rather in the nature of slush or half-liquid mud, which would not so stand, and therefore required to be kept up by some support, which largely exhausted the amount to be paid by the contractors for the work, who consequently made a large additional claim beyond the contract price of so much per cubic yard, and this claim was the subject of the arbitration. The arbitrator admitted evidence as to the nature of the soil, and the company thereupon applied to the Court to revoke the submission to arbitration on the ground that this was an irrelevant matter. The Court, however, declined, and so did the Court of Appeal. The concluding passage of the judgment was as follows:—On the whole, we are unable to say that the arbitrator has committed any mistake in law, or applied any of the evidence before him for any purpose for which it might not be legitimately applied. We therefore think that the award of December 3, 1888, is a good award for £165,164.5s. 11d., and that the rules which have been argued before us as to the validity of that award under the two submissions of November 26, 1885, must be discharged with costs.

The following counsel appeared in the case:—The

Attorney-General (with him Mr. Moulton, Q.C., Mr. Cripps, and Mr. R. Wallace) for the contractors; Sir Henry James, Q.C. (with him Mr. Pollard, Mr. Kenelm Digby, and Mr. G. Milmay) for the company.

#### WHITE PAINTS.

SIR,—In my article on "Some Special White Paints," published in your issue of April 27, I remarked that Griffith's zinc white was not quite white in tone, but of a creamy hue. Within the last few days I have received a sample of zinc white from Messrs. Griffith Brothers, for which they claim a purity of tint as white as carbonate of lead, either in oil or in powder. I enclose a portion of the sample, from which you see the claim is justified. In the interests of decorators and all persons interested in the use of perfectly innocuous white paint, I think my remarks on the creamy hue of Griffith's zinc white should be amended by the publication of the fact that it is no longer so, but of a true white nature. H. C. STANDAEGE.

May 11, 1889.

#### A CAUTION.

SIR,—Will you permit us to caution your readers against a man of about fifty-five years of age, who is going about and giving bogus orders for machinery and plant in the names of well-known builders? He paid us a visit last week, and gave us an order for a circular-saw bench, &c., in the name of a builder, stating he was his manager on some new works, and would require a considerable amount of fresh plant. Perhaps we need hardly say that "quite by accident he had forgotten his purse," and "could we oblige him," &c., but having been done once before in a similar way we were sorry we could not oblige him. On sending the order to the firm mentioned, it was stated to be a forgery. M. POWIS BALE & CO.

### The Student's Column.

#### TOWN DRAINAGE.

##### XX.—WASTE-PIPES OF HOUSE FITTINGS.

AN apparatus fixed in its place in a house and supplied with water is called a fitting; such is a wash-hand basin, a bath, or sink upon which things are washed up. This sort of sink is commonly under a water-trap, and is large and shallow; another sink is for washing vegetables, deep, and divided into two compartments, one for washing, and the other for rinsing. Another so-called sink is the basin into which the housemaid throws the chamber slops, called the slop-sink. Then there is the scullery sink and the washhouse sink, and there may be a butler's sink, these three being on either the basement or ground-floor, while the others are mostly on upper floors. The basin of a water-closet, with its pipes and appliances, is also a "fitting," and so is a urinal. Such of these fittings as are situated one above another have one vertical pipe in common, called the main waste-pipe, into which the waste water of the several fittings is conducted by branches, each of which has a trap upon it, and these several pipes and branches resemble the similar parts belonging to water-closets when situated one over another; but they differ in this respect, that the main waste-pipe of these fittings is never connected directly with the house-drain, as a soil-pipe is when it acts as the ventilating-pipe of the drain, but is always cut off from any direct communication with the drain by being made to discharge into a gully, outside the house, which has a trap between it and the drain, and is open to the atmosphere on its upper side. And not only does a vertical main waste-pipe differ from a soil-pipe which acts as the ventilating-pipe of the drain, but it differs from a soil-pipe which is not directly connected with the drain, inasmuch as this discharges into the gully under its grating, while the waste-pipe discharges over the grating, or rather into a short surface channel, which conveys the waste water into the gully, 18 in. or 2 ft. away from the wall, so that, in case of it becoming untrapped, by evaporation or otherwise, the foul air may not reach the end of the waste-pipe. The pipe by which the water is discharged from the basin or sink is called the waste-pipe, or, shortly, the waste.

When these fittings are situated one over another the main waste-pipe resembles the soil-pipe of a tier of water-closets in this, that it requires provision against siphonage of the lower traps, in the same way and for the same reason as does the soil-pipe, for the discharges into it from some of these are as great in bulk and as

sudden as those from water-closet basins. A painful of slops thrown into a housemaid's slop-sink displaces as much air in the waste-pipe as the water-flush does in a soil-pipe, and it requires replacing in the same way and for the same reason as that before described for soil-pipes, if one waste-pipe be made to serve for several floors; but a better plan is to have a waste-pipe from each floor; it needs then only to be ventilated from the crown of its trap to the outside air to ensure it against siphonage under every condition to which it is subject.

And, besides this advantage, another is that the waste-pipe need not be so large as when one alone serves for a tier of these fittings. That which is discharged adheres to some extent to the inside of a pipe, and the less the surface exposed the less offensive it will be. The quick descent of these discharges will prevent any stoppage of the pipe, however small, and if the crown of the trap of the one branch, which alone has to be dealt with in this case, be placed in close contiguity to the atmosphere by means of a short and sufficiently large pipe, the waste-pipe below the branch may be much smaller than it otherwise should be. When the waste-pipe of, say, a scullery sink, does not carry off the water fast enough it is generally not because the pipe is too small but because the water cannot enter the pipe freely through the small circular holes in a too small grating at the mouth of the pipe. All pipes of proper size to carry off what is discharged into them require a wider entrance than the size of the pipe itself, in the proportion of more than one-half its section greater, in a length equal to its diameter. Then the aggregate area of the openings in the grating should be much greater than the area of the mouth of the pipe, even when all the openings are free from dirt; but as they never are so the openings provided should be five times the area of the pipe. In that case a small waste-pipe is sufficient for all situations except that of a scullery-sink where a trap of the form of the letter S is placed upon the waste-pipe under the sink, and where much grease is discharged with the hot water. Here, if the pipe be small, grease collects at the top of the bend, at A in fig. 1. The screw cap for

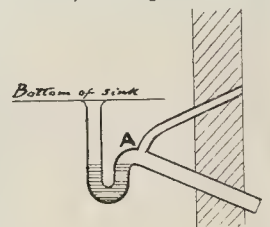


Fig. 1.

inspection placed at the bottom of the trap is of no assistance as a remedy for this stoppage by grease at the top of the bend.

As it has been found that grease does collect here, and that it interferes with the due delivery of the waste water from the sink, it has been attempted to remedy this inconvenience by putting in a large pipe. This certainly takes a longer time for the grease to accumulate to such a degree as to hinder the flow of water through the pipe, but it is no proper remedy. Then, when there results a continued bad smell from this accumulation of grease, the pipe is ventilated by a branch from the crown of the trap to the outside air, as in the figure; but the grease is left in the pipe all the same. One remedy that may be suggested is the use of a smaller pipe, the end of which dips into the water in the gully, and which has no S pipe upon it. In any such case as this, if a pipe, 1½ in. in diameter, be fixed from the sink to the gully without a trap, and the end of the pipe discharge under water in the gully, and the mouth of the pipe be 2 in. diameter, and the openings in the grating amount in the aggregate to 6 square inches, as in fig. 2, none however being longer than ½ in., or wider than ¼ in., the waste water may be discharged from the sink in tubful or otherwise without ruffling the temper of the most exacting kitchenmaid. At the same time it must be added that while the absence of the S trap prevents an accumulation of grease at the one point, a certain amount of it will cling in time to the sides of the vertical pipe, and will produce a smell, disagreeable though



not injurious; so that to a certain extent we are left with a choice of evils.

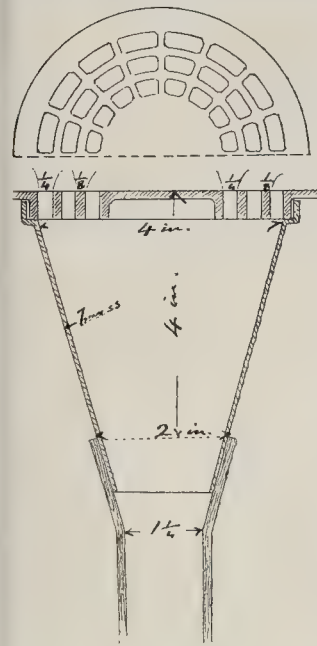


Fig. 2.

The same objection to a large waste-pipe, viz., that it exposes to the air a greater extent of foul surface, applies to urinals, but not to baths and lavatories, the waste-pipes of which may be larger and yet inoffensive. Taking the time of emptying a bath as the gauge for the size of a pipe, the emptying of sixty gallons of water in two or three minutes requires a pipe of considerable diameter, perhaps 2 in. in most situations, or 1½ in. in others; but the indirectness in these cases, and the valves which are necessary to be placed upon the pipe, govern the speed with which a bath is emptied, more than the size of pipe, except when it is of great length.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

8,391, Flush-out Basins. J. Craig.

The fans of the basins which are the subject of this patent are arranged so as to distribute separate currents for flushing out the contents, and for cleansing the sides of the basin. A raised portion extends from the flushing-rim down to the lower edge of the fan. The portion bearing against the interior surface of the basin encloses a space which is shut off from communication with the space between the remainder of the fan and the interior surface of the basin. The water supplied through the inlet horn or branch is divided by the raised rib on the back of the fan, one part of the current being directed to the outlet at the bottom of the fan and the other to the enclosed space, from whence it is led to a series of holes made at the edges of the fan. The effect of these divided currents is to thoroughly cleanse the sides of the basin.

8,533, Sash-cord-fasteners. G. Ridley.

According to this invention, in the face of the sash-frame, as near the glass as practicable, and on the inside, is cut out a slot with a curved bottom. Sloping up the groove in this slot is fixed a roughened pawl or eccentric lever, pivoted to the sash. To introduce a new cord, the cord is pushed down the groove, and the end comes out at the slot. The pawl or eccentric is then turned so as to bite the cord tight, and a wedge is used so as to lock it in place. The more strain there is on the cord the tighter is the fastening.

9,163, Additions to Water-closets. T. W. Twyford.

According to this invention, a wash-chamber is provided as an additional convenience, and this is made as part of the trap and basin. It is chiefly designed for export to the East, but is also a valuable sanitary addition for use in the Western Hemisphere.

1,646, Syphon Traps. E. Smith.

About two-thirds of the lower part of the trap which is the subject of this patent is rounded so as to form a bottom, the other part being somewhat prolonged and left open. An upward projection from this rounded bottom forms a basin in the part of the trap with the bottom, and also forms in conjunction with a downward projection from the said bottom and the prolonged part of the trap the outlet or one leg of a syphon, the end of which is generally worked to a rounded form when the trap is made of cast metal. An over-lapping lip or partition is fixed with its upper part joined to the outlet side of the trap, near the top, and with its lower edge on a lower level than the top of the upward projecting partition, and at such a distance from the said upward projecting partition as to leave space sufficient for the exit of all water which enters the top of the trap, excepting what is retained by the depth of the part which forms a basin, the water thus retained forming a seal, and preventing the escape of gases from the pipes or drain to which the trap is attached.

2,857, Planes. G. W. Meister.

The plane-iron which is the subject of this patent does not pass through the stock, nor is it fastened by the usual method of wedging. The plane-iron is adjusted by two screws, and is fixed in a small hollow in the stock. A plane constructed in this way is very strong, admits of rapid and ready adjustment of the plane-iron, and the plane-iron does not work loose.

3,875, Seasoning or Preserving Wood. S. E. Haskin.

To obviate necessity for the great length of pipes required by the ordinary method of vulcanising wood, this inventor uses a vulcanising chamber which is smaller, but much more economical in practice. Heated air is introduced into this chamber under such pressure as will prevent the evaporation of the sap of the wood under treatment, more or less of the moisture of the compressed air having been precipitated before the air is discharged into the wood cylinder.

4,326, Cowl or Ventilator. J. D. Fryer.

The cowl which is the subject of this patent revolves upon ball bearings, and the shaft has openings so shaped that the wind blowing into them is diverted into upward currents. The cowl is surmounted with vanes, which are bent so as to form leaves of an archimedean screw, and thus in revolving the upward current is assisted.

## NEW APPLICATIONS FOR PATENTS.

April 29.—7,075, F. Harrop and F. Chippis, Window-fastening.—7,109, A. Rammage, Fireproof Partition for Building Construction.—7,154, J. Thom, White Lead.

April 30.—7,156, J. Macfarlane, Yellow Pigment.—7,164, J. Kimin, Chimney Pot or Top, and fixing same.

May 1.—7,223, J. Clayton and C. Tindall, Water-closets.—7,241, J. Wilson, Walls, Buildings, &c.—7,253, W. Hilliard, Dowel or Dowel-pin.—7,263, W. Thomas, Door-stop.

May 2.—7,306, G. Williams, Flush-bolts for Doors, &c.—7,307, G. Williams, Barrel-bolts for Doors, &c.—7,315, W. Vyse, Slow combustion Stoves.

May 3.—7,404, J. and D. Rowell, Iron Walls and Fences.—7,425, D. Prescott, Band-saw Mills.—7,429, O. and J. Haer, Scaffolding for Painters, Decorators, &c.

May 4.—7,463, S. Gully, Locking Doors.—7,478, A. Tanner and A. Godart, Decorating Lead or other Frost Glazing.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

4,495, T. Houghton, Chimney-pot, &c.—4,757, C. Lett, Securing and Steadying Window-sashes.—5,175, T. Wintour, Ventilating Apparatus.—5,595, R. Roberts, Prevention of Down-draught in Chimney-pots.—6,018, R. Hadden, Belt or Binding for Paint-brushes, &c.—6,152, W. Williams, Ventilator for Buildings.—6,389, E. Edwards, Roof Ventilators.—6,382, F. Bartlett, Heating and Ventilating.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

6,222, W. Pryke and W. Palmer, Eaves Gutters.—6,338, H. Lansbury, Weather-bars for Doors and Windows.—5,831, J. Chatham, Crushing and Mixing Mortar.—9,360, J. and W. Cormack, Ventilators.—9,442, M. Lansell, Set Squares, T Squares, &c.—12,324, A. Gibson, Feed Mechanism for Saw-mills.—16,004, P. Mugford, Securing Tiles in Firegrate Jambes.—2,706, E. Edwards, Window-sash Fasteners.—4,306, Sir E. Harland, Elastic Tiles.—5,400, W. Thomas and W. Strong, Window-fasteners.—5,490, T. Taylor, Securing Door-knobs to Spindles.

**Appointment.**—At a meeting held on Monday evening by the Willenhall Local Board, Mr. Robert Wolstencroft, of Birmingham, was appointed clerk of works to superintend the carrying out of their sewerage works under their engineer and surveyor.

## RECENT SALES OF PROPERTY:

## ESTATE EXCHANGE REPORT.

MAY 6.—By W. W. JENKINSON.

Brixton—F. g. r. of £20, with reversion in 80 yrs. to £515  
Kingland—16 and 18 Canterbury-rd., ut. 22 yrs., g. r. £7, 10s., r. £27, 10s. p.a. 530  
137, 139, and 141, Colford-rd., ut. 35 yrs., g. r. £12, s. r. £130 p.a. 900  
Holloway—56A, Durham-rd., ut. 27 yrs., g. r. £8, 10s., r. £40 p.a. 399

By HARMAN BROS.

Lewisham High-road—The f. residence "Tremorah" 1,750  
By C. D. FIELD & SONS.  
Clapham—55 to 63 (odd), Webb's-rd., ut. 22 yrs., g. r. £34, s. r. £188 p.a. 1,050  
West Norwood—29, Lancaster-rd., ut. 74 yrs., g. r. £11, s. r. £35 p.a. 585  
Deptford—8, Arthur-rd., ut. 56 yrs., g. r. £4, r. £30 p.a. 285  
Rotherhithe—F. g. r. £40 p.a., with reversion in 96 yrs. to £208 p.a. 900

MAY 7.—By BEAL, SON, & CHARLES.

Piccadilly, No. 109—The lease, ut. 134 yrs., r. £200 p.a. 1,040

By C. & F. RUTLEY.

Caterham—F. house, shop, and show-room, r. £70 p.a. 1,050

By GIDDY & TURNER.

Chertsey Station, near—"Merrylands" and 3a, 3b, 21p. f. 1,800

By E. J. GAIBDEN.

Whitechapel—F. g. r. of £2, reversion in 1½ yrs. to £21 p.a. 260  
36 and 38, Underwood-st., reversion in 1½ yrs. to £74 p.a. 660  
80, Underwood-st., f. r. £28, 12s. p.a. 340  
62 and 64, Underwood-st., f. r. £38 p.a. 520  
66, Underwood-st., reversion in 1½ yrs. to £24, 14s. p.a. 275  
F. g. r. of £4, reversion in 1½ yrs. to £20, 8s. p.a. 440

By C. & H. WHITE.

Clapham—102, Fentiman-rd., f. with possession ... 820  
100 to 108 (even), Clapham-rd., ut. 74 yrs., g. r. £25, r. £253 p.a. 299  
Brixton—8 to 12 (even), Baker-st., ut. 12 yrs., g. r. £8, 10s. 3d., r. £28, 8s. p.a. 290  
Kennington—8, Princes-rd., ut. on lives, g. r. £1, 10s., r. £30 p.a., and a policy for £20 p.a. 190  
Camberwell—2 to 12, 17, 19, 25, 27, and 29, Caspian-st., f. r. £371 p.a. 3,310  
70, 80, and 82, Brinsford-st., f. r. £85, 16s. p.a. 625  
244, 251, and 253, Albany-rd., f. r. £73, 8s. p.a. 685

By DERRINAM, TAYLOR, & CO.

City—3, Union-st., f. area 330 ft. 4,129  
Kensington—22 to 30 (even), Gordon-pl., ut. 83 yrs., g. r. £75, r. £455 p.a. 4,280  
32 to 36 (even), Gordon-pl., ut. 35 yrs., g. r. £20, r. £350 p.a. 3,460  
19, Ball-st., ut. 61 yrs., g. r. £15, r. £80 p.a. 1,020  
Holloway—2 to 28 (even), Langdon-rd., f. r. £440 p.a. 5,885

Freehold modern stabling and yard, r. £100 p.a. 1,680  
90, Junction-rd., f. r. £40 p.a. 700  
Camden-rd.—16, Parkside-rd., ut. 65 yrs., g. r. £28, 6s., r. £90 p.a. 800

16, 20, and 36, Hillmanton-rd., ut. 67 yrs., g. r. £27, 10s., r. £138 p.a. 1,605  
38, Hillmanton-rd., ut. 67 yrs., g. r. £10, 10s., r. £43 p.a. 350

88, 100, and 126, Hungerford-rd., ut. 73 yrs., g. r. £17, 17s., r. £108 p.a. 970  
43, Camden-park-rd., ut. 74 yrs., g. r. £4, r. £38 p.a. 320

Kentish-town—76, Gaisford-st., ut. 60 yrs., g. r. £3, 9s., r. £45 p.a. 455  
Haverstock-hill—109, Queen's-cres., ut. £63 p.a. g. r. £7, r. £40 p.a. 385

MAY 8.—By BAXTER, PAYNE, & LEPPER.

Shortlands, Kent—"The Vale," f. r. £70 p.a. 1,000

By JOHN BOTT.

Nonhead—3, Nonhead gr., ut. 50 yrs., g. r. £8, r. £35 p.a. 250  
Horne-hill—16, Gubyon-avenue, 59 yrs., g. r. £8, 10s., r. £40 p.a. 410

By IMMAN, SHARP, HARRINGTON, & ROBERTS.

Cavendish-sq.—72, Margaret-st., ut. 25 yrs., g. r. £20, r. £130 p.a. 1,330  
73, Margaret-st., ut. 25 yrs., g. r. £20, r. £130 p.a. 1,400  
Lambeth—L. g. r. of £236, 4s. 3d., ut. 19 yrs., rent value £3,900 p.a. 4,200

MAY 9.—By WATHERBELL & GREER.

Maid Vale—18, Randolph-cr., ut. 78 yrs., g. r. £24, r. £160 p.a. 1,660  
8, Randolph-cr., ut. 78 yrs., g. r. £18, s. r. £120 p.a. 1,003

By JENKINS, BONS, & ELIAS.

Brookley-rd.—Nos. 203 and 210, ut. 83 yrs., g. r. £3, 1s., s. r. £83 p.a. 600  
New Cross—76 and 78, Shardeloes-rd., ut. 76 yrs., g. r. £4, r. £26 p.a. 495

80 and 82, Shardeloes-rd., ut. 75 yrs., g. r. £8, 10s., r. £61 p.a. 500

By GLASIER & SONS.

Barnes, High-st.—F. f. r. £70 p.a. 1,760  
Regent-st.—No. 183, ut. 30 yrs., g. r. £27, r. £400 p.a. 6,175  
Lisson-grove—L. g. r. of £100, term 33 yrs. 1,520  
Regent's Park—L. g. r. of £114, 12s. 8d., ut. 33 yrs., r. £20 p.a. 850

By RUSHWORTH & STEVENS.

Halford Green—"Battlecrease Hall," f. with possession 830  
"The Three Horse Shoes" beerhouse, f. r. £35 p.a. 850  
Brasted Chart, Kent—Two plots of f. land, 1a, Or. 35p. 200

Sunbury—"Holy Cottage," &c., r. £50 p.a. 543

By J. McLEACHAN & SONS.

Streatham—1 and 2, Glenburnie-rd., ut. 99 yrs., g. r. £12, r. £83 p.a. 350

By NEWBORN & HARDING.

Balls Pond—1, Mildmay-park, f. r. £70 p.a. 1,565



|                                                         |       |
|---------------------------------------------------------|-------|
| City-road—No. 302, u.t. 53 yrs., g.r. £2, r. £20        | 450   |
| p.s. ....                                               |       |
| Horsely-lane—The f. residence, "Tudor Lodge,"           | 2,500 |
| with possession .....                                   |       |
| Holloway—27, Carleton-rd., u.t. 86 yrs., g.r.           | 1,305 |
| £20, 6s., r. £100 p.a. ....                             |       |
| By C. C. & T. MOORE.                                    |       |
| Victoria Park-rd.—No. 131, u.t. 54 yrs., g.r. £3. 10s., | 350   |
| r. £45 p.a. ....                                        |       |
| Mill End—86, 87, and 89, Devonshire-st., u.t. 28        | 450   |
| yrs., g.r. £220, 5s., r. £75. 1s. ....                  |       |
| By E. BRUNSON.                                          |       |
| Westminster Bridge-rd.—2 to 5, Duke-st., u.t. 30        | 255   |
| yrs., g.r. 1s., r. £138. 18s. ....                      |       |
| Battersea—46, Stenard-rd., f., e.r. £40 p.a. ....       | 390   |
| Brixton—108 and 110, Holland-rd., u.t. 34 yrs., g.r.    | 485   |
| £10. 10s., r. £67 p.a. ....                             |       |
| Old Kent-rd.—39 and 30, Mawbey, s.t. 28 yrs.,           | 230   |
| g.r. £8. 12s., r. £65 p.a. ....                         |       |
| Peckham—42, 44, and 46, Camden-gr. North, u.t.          | 450   |
| 72 yrs., g.r. £7. 4s., r. £21. 18s. ....                |       |
| Lambeth—5, Eaton-st., u.t. 17 yrs., g.r. £4. 10s.,      | 50    |
| r. £28 p.a. ....                                        |       |
| Islington—176, Liverpool-rd., u.t. 63 yrs., g.r. £20,   | 22    |
| r. £30 p.a. ....                                        |       |
| Wandsworth-rd.—No. 398, u.t. 37 yrs., g.r. £3. 10s.,    | 380   |
| r. £20 p.a. ....                                        |       |
| Battersea—9 and 11, Octavia-st., u.t. 88 yrs., g.r.     | 535   |
| £12, r. £66 p.a. ....                                   |       |
| West Ham—F.g.r. of £18. 10s., with reversion in         | 400   |
| 88 yrs. to e.r. of £100 p.a. ....                       |       |
| May 16.—By R. RIND.                                     |       |
| Hyde-pk.—36, Ennismore-gdns., u.t. 28 yrs., g.r.        | 1,700 |
| £29, r. £100 p.a. ....                                  |       |
| By ELLIS & SON.                                         |       |
| Waltham-rd.—24 to 38 (even), f., area 5,107 ft. ...     | 4,300 |
| St. George's-in-East—F.g.r. of £20, with reversion      | 1,530 |
| in 11 yrs. to e.r. of £11 p.a. ....                     |       |
| F.g.r. of 45, with reversion in 11 yrs. to e.r. of      | 330   |
| £35 p.a. ....                                           |       |
| F.g.r. of £16. 10s., with reversion in 15 yrs. to       | 990   |
| e.r. of £13 p.a. ....                                   |       |
| F.g.r. of £89. 6s., with reversion in 30 yrs. to e.r.   | 1,700 |
| of £250 p.a. ....                                       |       |
| By NEWBORN & HARDING.                                   |       |
| Homerton—150, High-st., f., r. £32. 10s. p.a. ....      | 295   |
| Kingsland—38 to 44 (even), Beaulieu-st., u.t. 31        | 880   |
| yrs., g.r. £14, r. £136. 10s. p.a. ....                 |       |
| Old Ford-road—Nos. 415, 420, and 422, f., r. £79        | 990   |
| p.a. ....                                               |       |
| 91 to 99 (odd), Bond, f., r. £75. 8s. p.a. ....         | 1,040 |
| 5 to 15 (odd), Wright's-rd., f., r. £139 p.a. ....      | 1,820 |
| 3 and 5, Beale-rd., f., r. £50. 14s. p.a. ....          | 105   |
| A plot of f. land in Beale-rd. ....                     | 220   |
| Waltham-rd.—A plot of f. land in Byron-rd. ....         | 8     |
| A plot of f. land in Milton-rd. ....                    | 6     |
| A plot of f. land in Beaulieu-rd. ....                  | 80    |

[Constructions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; e. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; p. for place; rd. for road; sq. for square; pl. for place; ter. for terrace; y.d. for yard, &c.]

## MEETINGS.

|                                                                                                                                                                                                                                                                              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| SATURDAY, MAY 19.                                                                                                                                                                                                                                                            |  |
| Edinburgh Architectural Association.—Visit to Arncliffe House and Temple Church.                                                                                                                                                                                             |  |
| MONDAY, MAY 20.                                                                                                                                                                                                                                                              |  |
| Royal Institute of British Architects.—Professor Atkinson, A.R.A., on "The Roman Thermae." 8 p.m.                                                                                                                                                                            |  |
| Society of Arts (Confer. Lectures).—Mr. H. Graham Harris on "Heat Engines other than Steam." III. 8 p.m.                                                                                                                                                                     |  |
| TUESDAY, MAY 21.                                                                                                                                                                                                                                                             |  |
| Institution of Civil Engineers.—(1) Further discussion on Mr. W. H. Greenwood's paper on "The Treatment of Steel by Hydraulic Pressure, and the Plant employed for the purpose." (2) Mr. E. E. Sawyer, M.A., on "West of India Portuguese Railway and Harbour Works." 8 p.m. |  |
| Royal Statistical Society.—Mr. S. Bourne on "Variations in the Volume and Value of the Exports and Imports of the United Kingdom in Recent Years." 7.45 p.m.                                                                                                                 |  |
| Birmingham Architectural Association.—Paper by Mr. W. H. Bidlake, M.A.                                                                                                                                                                                                       |  |
| WEDNESDAY, MAY 22.                                                                                                                                                                                                                                                           |  |
| Society of Arts.—Mr. A. F. Yarrow on "The Use of Spirit as an Agent in Prime Movers." 8 p.m.                                                                                                                                                                                 |  |
| Inventors' Institute.—8 p.m.                                                                                                                                                                                                                                                 |  |
| THURSDAY, MAY 23.                                                                                                                                                                                                                                                            |  |
| Society of Antiquaries.—8.30 p.m.                                                                                                                                                                                                                                            |  |
| Institution of Electrical Engineers.—Mr. W. M. Mordey, on "Alternate Current Working." 8 p.m.                                                                                                                                                                                |  |
| SATURDAY, MAY 25.                                                                                                                                                                                                                                                            |  |
| Architectural Association.—Visit to House in Kensington-court. 3 p.m.                                                                                                                                                                                                        |  |

## Miscellaneous.

**Artists' General Benevolent Institution.**—The Lord Chancellor took the chair at the seventy-fourth anniversary dinner of this Institution on Saturday last, at the Whitehall Rooms of the Hôtel Métropole. Among the company present, numbering upwards of 250, were Lord Crewe, Sir F. Leighton, P.R.A., Sir J. Millais, R.A., Sir J. D. Linton, P.R.L., Mr. Val Prinsep, A.R.A., Mr. Alfred Hunt, R.W.S., and Sir J. C. Robinson. In proposing the toast of the evening, "Prosperity to the Artists' General Benevolent Institution," the Chairman said that the toast and the cause it indicated required no advocacy from any one. Other speeches followed, and subscriptions to the amount of 3,069s. were announced by the treasurer (Mr. F. C. Hardwick).

**Royal Meteorological Society.**—The usual monthly meeting of this Society was held on Wednesday evening, the 15th inst., at the Institution of Civil Engineers, 25, Great George-street, Westminster. Dr. W. Marrett, F.R.S., President, in the chair. Mr. T. H. Hall was elected a Fellow of the Society. The first paper read was an "Account of some experiments made to investigate the connexion between the Pressure and Velocity of the Wind," by Mr. W. H. Dines, B.A., F.R. Met. Soc. These experiments were made for the purpose of determining the relation between the velocity of the wind and the pressure it exerts upon obstacles of various kinds exposed to it. The pressure-plates were placed at the end of the long arm of a whirling machine, which was rotated by steam power. The author gives the results of experiments with about twenty-five different kinds of pressure-plates. The pressure upon a plane area of fairly compact form is about  $1\frac{1}{2}$  lb. per square foot at a velocity of twenty-one miles per hour, or, in other words, a pressure of 1 lb. per square foot is caused by a wind of a little more than seventeen miles per hour. The pressure upon the same area is increased by increasing the perimeter. The pressure upon a  $\frac{1}{4}$  ft. plate is proportionally less than that upon a plate either half or double its size.\* The pressure upon any surface is but slightly altered by a cone or rim projecting at the back—a cone seeming to cause a slight increase, but a rim having apparently no effect.

**The Great Plague of London.**—At a meeting of the Association of Public Sanitary Inspectors of Great Britain, held on Saturday evening, at the Westminster Town Hall, an address was given by Mayor Greenwood, on "The Great Plague of London," with special reference to the sanitary state of the city in 1665 and in 1889. Mr. H. Alexander presided. Mayor Greenwood, after giving a history of the plague, concluded by comparing the London of 1665 with the London of 1889, and said that while it must be confessed that London of the present was incomparably better, from a sanitary point of view, it was in some points more to blame. If the importance of sanitary reforms were better understood and more considered by the people, he contended that in a few years London might boast of a sanitary excellence far higher than its present one, compared with which its improvement since 1665 would be comparatively insignificant. He declared that the present water-supply was insufficient. After drawing attention to the sewerage and drainage, he pointed out the evils of the present overcrowding, and held that some effort must be made to improve the housing of the working classes. A discussion followed, in the course of which it was urged that the present sanitary conditions were insufficient for the requirements of the ever-growing population, and several of the speakers advocated an alteration to the existing burial laws, and held that the disposal of the dead would be best effected by cremation.

**The English Iron Trade.**—The English iron market has been almost unchanged during the past three weeks. Although trade has been somewhat quieter, quotations have been fairly well maintained, the firm tone being due to the knowledge that, with the rising tendency of raw materials and wages, it is impossible for manufacturers to submit to reductions. During the past week pig-iron has been steady at old prices; makers in Cleveland adhering to their quotation of 40s. for prompt iron, while merchants are only slightly below it. In the other districts where pig-iron is made, a steady tone has prevailed, while Bessemer pig shows an improvement in tone. In the Glasgow warrant market there have not been very great fluctuations, and prices are about the same as those ruling a week ago. Manufactured iron is in slower inquiry, and prices are slightly easier. Steel continues in strong demand, and steel rails have recovered the drop of 2s. 6d. a ton which they experienced a week ago in the north-west. The inquiry for new ships is less active than it was a short time back, but the trade is pretty free from trade disputes, the men working steadily. Engineers are still briskly employed.—Iron.

**A Scandinavian Industrial Exhibition.**—A Scandinavian Industrial Exhibition is to be held in Stockholm during the summer of 1892 the project being supported by leading Scandinavian manufacturers.

\* We give this as communicated to us by the Secretary of the Society. The statement seems only partially reconcilable with that of the preceding sentence.—Ed.

**The Parkes Museum.**—A general meeting of this Society was held on the 10th inst., Dr. G. V. Poore in the chair, for the purpose of completing the arrangements necessary for carrying out the amalgamation of the Parkes Museum with the Sanitary Institute. We are officially informed that "although the Parkes Museum will cease to exist as a separate body, it will still be carried on in the same premises as part of the Sanitary Institute or combined society, and its scope will be enlarged, and its usefulness greatly increased. In order to conform to legal technicalities it was necessary that it should be wound up, but it is satisfactory to note that the Parkes Museum in closing its works was able to transfer to the new Institute its museum and library, which has been a collection of many years, the lease of the premises, and also a cash balance amounting to nearly 900s."

**Sheffield Society of Architects and Surveyors.**—At a special general meeting of this Society on May 7, the following resolutions were passed:—(1) That this Society, whilst reiterating its opinion that a Bill to promote the registration of architects and surveyors is desirable, cannot approve of the Bill now being promoted by the Architects' and Engineers' Registration Committee. (2) That this Society earnestly hopes that the Royal Institute of British Architects and the Surveyors' Institution will endeavour to promote, at an early date, an efficient Bill for the registration of architects and surveyors. (3) That copies of the foregoing resolutions be sent the Royal Institute of British Architects, the Surveyors' Institution, and the promoters of the Bill.

**Boscombe Chine, Bournemouth.**—The Chine Hotel of this favourite watering-place has lately been overhauled, and a new wing added to it. The sanitary arrangements have all been reconstructed by Mr. John Smeaton, of London, to whom also was entrusted the heating of the building. This has been carried out upon what is known as the "low-pressure" system, the boiler being of the "Trentham" Cornish type, situated in a vault outside the main building. The domestic supply is on the "Cylinder" system, and the whole work has been carried out under the superintendence of the architect, Mr. W. H. Fletcher, of London.

**The Peterborough Brick Trade.**—We hear that this trade keeps exceedingly busy, and that the makers have orders for some time ahead. The London and North-Western Railway Co. have sent one of their officials from Euston to Woodstone and Fletton to report as to connecting their system to the various yards, by means of siding accommodation similar to that already provided by the Great Northern Railway.

**Grundy's Heating Apparatus Works.**—Plans for the extension of the well-known Heating Apparatus Works, at Tyldesley, near Manchester, owned by Mr. John Grundy, of Duncan-terrace, City-road, London, have just been approved by the Building Committee of the Local Board.

**Health of Ealing.**—The Medical Officer of Health for the District of Ealing, in his annual report for 1888, just published, gives the death-rate at the low figure of 10.9 per thousand, and the average for three years at only 11.5 per thousand.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                               |           | 2s. | d. | 2s. | d. |
|---------------------------------------|-----------|-----|----|-----|----|
| Greenheart, B.G.                      | ton       | 6   | 10 | 7   | 10 |
| Teak, E.I.                            | ton       | 11  | 0  | 15  | 0  |
| Sequoia, U.S.                         | foot cube | 0   | 2  | 0   | 3  |
| Ash, Canada                           | ton       | 8   | 10 | 5   | 0  |
| Birch "                               | "         | 8   | 10 | 5   | 0  |
| Elm "                                 | "         | 4   | 0  | 5   | 0  |
| Fir, Dantisc, &c.                     | "         | 2   | 0  | 3   | 10 |
| Oak "                                 | "         | 2   | 10 | 4   | 10 |
| " Canada "                            | "         | 5   | 10 | 7   | 10 |
| Pine, Canada red "                    | "         | 3   | 5  | 4   | 0  |
| " yellow "                            | "         | 3   | 10 | 5   | 10 |
| Lath, Dantisc "                       | fathom    | 4   | 10 | 5   | 10 |
| St. Petersburg "                      | "         | 3   | 10 | 5   | 10 |
| Weinscot, Riga, &c.                   | leg       | 2   | 15 | 4   | 5  |
| Odessa, crown "                       | "         | 0   | 0  | 0   | 0  |
| Deals, Finland, 2nd and 1st, std. 100 | "         | 9   | 10 | 11  | 0  |
| " 4th and 3rd "                       | "         | 8   | 10 | 9   | 0  |
| Riga "                                | "         | 7   | 10 | 9   | 0  |
| St. Petersburg, 1st yellow "          | "         | 11  | 0  | 15  | 0  |
| " 2nd "                               | "         | 10  | 0  | 11  | 0  |
| " white "                             | "         | 7   | 10 | 10  | 10 |
| Swedish "                             | "         | 9   | 0  | 16  | 0  |
| White Sea "                           | "         | 9   | 10 | 17  | 0  |
| Deals—Canada, Pine, 1st "             | "         | 15  | 0  | 26  | 10 |
| " 2nd "                               | "         | 11  | 0  | 17  | 10 |
| " 3rd, &c. "                          | "         | 8   | 0  | 10  | 10 |
| " Spruce, 1st "                       | "         | 9   | 10 | 11  | 0  |
| " 3rd and 2nd "                       | "         | 7   | 10 | 9   | 0  |
| New Brunswick, &c. "                  | "         | 6   | 15 | 8   | 15 |



LONDON.—For taking down and rebuilding at 29  
Maddox-street, W., as house and studio for Mr. George  
Alfred Rogers. Mr. G. William Bartlett, architect:—

|                             |        |   |   |
|-----------------------------|--------|---|---|
| Cole and Sons               | £3,098 | 0 | 0 |
| Ashby Bros.                 | 2,976  | 0 | 0 |
| Smith & Co.                 | 2,373  | 0 | 0 |
| Bywaters                    | 2,859  | 0 | 0 |
| Simpson & Son               | 2,777  | 0 | 0 |
| Patman & Fotheringham       | 2,763  | 0 | 0 |
| Wood, Cleveland-street, E.* | 2,683  | 0 | 0 |

LONDON.—For heating by warm air the new Church of St. Thomas, St. Thomas's-road, Finsbury Park, London. Mr. Ewan Christian, architect:—  
John Grundy (accepted) ..... £157 0 0

|                             |       |   |   |
|-----------------------------|-------|---|---|
| C. & E. Harman .....        | 1,900 | 0 | 0 |
| Taylor Bros. ....           | 1,889 | 0 | 0 |
| A. H. White (accepted)..... | 1,870 | 0 | 0 |



**SOUTHAMPTON.**—For the erection of a Memorial Clock Tower and Drinking Fountain, for the executors of the late Mrs. Harriett Bellenden Sayers. Mr. S. K. Pope, architect, 27, Portland-street, Southampton. Quantities by Mr. F. Thomson, 5, Great James-street, Bedford-row, W.C.

|                       |      |    |      |   |   |
|-----------------------|------|----|------|---|---|
| Brinton & Bone .....  | £270 | A. | £270 | 0 | 0 |
| W. Franklin .....     | 640  | 6  | 0    | 0 | 0 |
| J. Nichols .....      | 633  | 6  | 0    | 0 | 0 |
| Garret & Haysom ..... | 665  | 6  | 0    | 0 | 0 |

A.—Estimate based on Competition Report, not including Surveyor's fee.  
B.—Estimate with extras on Whitbed stone, polished red Aberdeen granite columns, &c., including Surveyor's fee.

**STOKE-UPON-TRENT.**—For alterations to the Wheat-sheaf Hotel, Stoke-upon-Trent, contract No. 2. Mr. Edwin Penn, architect, Stoke-upon-Trent. —  
J. Breeze, of Stoke .....

**STROUD (Gloucestershire).**—For drainage at Union Workhouse, for the Board of Guardians. Mr. W. H. O. Fisher, St. Paul, architect. —  
Gardiner & Son (accepted) .....

**SUTTON (Surrey).**—For erecting cemetery chapel, lodge, mortuary, boundary walls, &c., for the Sutton Local Board. Mr. E. W. Crickmay, architect. Quantities by Mr. W. E. Stonor:—

|                         | Chapel. | Lodge. | Mort'y. | Walls. | Total. |
|-------------------------|---------|--------|---------|--------|--------|
| Lobb & Oliver .....     | 2,179   | 1,100  | 450     | 1,350  | 5,079  |
| F. Wyatt .....          | 1,885   | 1,001  | 418     | 1,435  | 4,739  |
| E. J. Burnard .....     | 1,851   | 978    | 380     | 1,320  | 4,529  |
| Martin Taylor .....     |         |        |         |        |        |
| Croydon .....           | 1,978   | 948    | 367     | 1,239  | 4,531  |
| S. Page, Croydon .....  | 2,027   | 983    | 370     | 1,073  | 4,453  |
| A. H. Harris .....      | 1,812   | 817    | 350     | 1,392  | 4,371  |
| Kirk Bros. .....        | 1,800   | 950    | 370     | 1,250  | 4,370  |
| Dickson & Wallis .....  | 1,795   | 940    | 385     | 1,330  | 4,350  |
| Smith & Bullard .....   |         |        |         |        |        |
| Croydon .....           | 1,810   | 950    | 369     | 1,159  | 4,290  |
| W. Holt, Croydon .....  | 1,805   | 900    | 350     | 1,112  | 4,109  |
| W. Gibson, Exeter ..... | 1,845   | 852    | 343     | 1,110  | 4,150  |
| Russell & Ball .....    |         |        |         |        |        |
| Sutton .....            | 1,850   | 815    | 390     | 1,203  | 4,048  |
| J. Hale, Sutton .....   | 1,768   | 840    | 344     | 1,095  | 4,037  |
| Lye, Sutton .....       | 1,879   | 845    | 297     | 917    | 3,938  |
| Nightingall .....       | 1,653   | 841    | 346     | 1,084  | 3,824  |
| R. J. Humphris .....    |         |        |         |        |        |
| Sutton .....            | 1,845   | 842    | 344     | 1,067  | 3,900  |
| J. B. Potter .....      |         |        |         |        |        |
| Sutton .....            | 1,681   | 803    | 331     | 1,132  | 3,878  |
| Longley & Co. .....     | 1,696   | 796    | 338     | 1,050  | 3,871  |
| J. Pillar .....         | 1,680   | 812    | 326     | 949    | 3,797  |
| Yeatman, Peckham .....  |         |        |         |        |        |
| Ham Bye .....           | 1,641   | 821    | 324     | 1,001  | 3,787  |
| J. Holloway .....       | 1,650   | 599    | 329     | 1,029  | 3,598  |
| H. Adams, Sutton .....  | 1,490   | 745    | 280     | 879    | 3,394  |
| Hugh Knight .....       | 1,496   | 726    | 295     | 866    | 3,377  |

For the Drainage of the New Cemetery.  
H. Adams .....

**TUNBRIDGE WELLS.**—For detached private residence on the Belvedere Park estate, for Mr. A. D. Thomson. Mr. Alfred Bower, architect, Epsfield —  
C. M. Strange (accepted) .....

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# The Builder.

VOL. LVI. No. 2426.

SATURDAY, MAY 27, 1899.

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| St. Luke's Church, Richmond: Exterior View, Plan, and Interior View.—Messrs. Goldie, Child, & Goldie, Architects..... | Two Double-Page Photo-Lithos. |

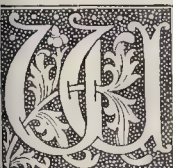
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### Building Materials.



WE are now presented with a second edition of the third volume of the series of "Notes on Building Construction,"\* which have been brought out, with no author's name, as construction books on practical building work in accordance with the requirements of the Science and Art Department. This third volume deals with the section of materials, including information in regard to stones, bricks and brick-making, lime and cement, iron and steel, timber, and various materials of minor importance in connexion with building. Like the other volumes, this section of "Notes on Building Construction" is eminently practical in form, and appears to have been got up with great care and with every desire to render it a reliable guide to the student.

The first chapter, dealing with stone, has been corrected and enlarged from the series of articles on "Stone Quarries" which appeared in our columns during the latter half of the year 1886, a circumstance freely acknowledged by the author. We shall not, of course, attempt to criticise any portions of the work derived from this source. But much of the other matter stands as it did in the first edition in 1879, and as a considerable advance has been made in our knowledge since that date, it would have increased the value of the work if certain portions had been re-written and the whole brought up to date.

After a few general observations showing the scope of this section of the book, the chief characteristics of building stone are pointed out. Under this heading durability, facility for working, hardness, strength, weight, appearance, position in quarry, seasoning, and the agents which destroy stones, are all briefly described; whilst the sub-section treating of durability is sub-divided, and, amongst other things, it deals with the physical structure of stone. The author admits that the physical structure of a stone is of the greatest importance in determining its durability, yet the

matter is dismissed in a very few sentences. If the broad features of the structure of a typical granite, sandstone, and limestone were briefly described, they would serve to more vividly impress on the mind of the student the important rôle played in the preservation of stones by their structure in contradistinction to their chemical composition. The section following, which deals with the examination of stone, contains much excellent material, but it would have been better to have said nothing about Brard's test, as this was shown years ago to be of no practical value. On the other hand, a few observations on the use of the microscope in testing durability would have been very appropriate, in view of recent research.

Considerable space is then devoted to granites, syenitic granites, and other igneous rocks, and a table is drawn up giving the principal granite quarries in Great Britain and Ireland. These latter are not in all cases correctly described. For example, on a recent visit to Cornish quarries we failed to find Mill Hill, Madun, and were told that it should be New Mill, Madron; Penryn is not in Leicestershire, but in Cornwall; Birsmon, we believe, should be Birsemore; and Torres Forest, Kinton, is apparently intended for Tom's Forest, Kintore.

Slates, schists, and serpentine are next dealt with, after which the principal kinds of sandstone are described at some length, including their composition, colour, classification, uses, &c. An exhaustive table, showing the principal sandstone quarries, with remarks on the various stones, is appended. Limestones and marbles are similarly treated. These portions of the work are written in a masterly style, and we question whether such a mass of information of the kind has ever been brought together before, in such a limited space. A few artificial stones next find a place, followed by a concise account of the different methods adopted in preserving stone. The first chapter is concluded with tables giving the resistance to crushing, tensile strength, absorption of water, and weight of many kinds of stone. But these tables are not so useful as they at first sight appear, for they are not sufficiently explicit in stating the exact kind of stone referred to in the results of the experiments. It would not have been very difficult to be more precise on this point. For instance, in the table of the resistance of the stones to crushing, it is of very little use to give the strength of Aberdeen, Cornish, and Irish

granite; York paving and quartz rock sandstones; and compact Portland, Chilmark, &c., limestones, unless the quarry from which each kind has come is also mentioned in the case of the granites, and not only the quarry, but the horizon in it from which the specimens experimented upon were taken in the case of the sandstones and limestones.

The next section of the book treats of bricks, tiles, terra-cotta, and the various other materials of which clay forms the principal constituent. It commences with a concise and clear description of the different kinds of brick-earths, and shows the effect upon them of the presence of foreign substances—other than silica and alumina,—in different proportions. The injurious effect of soluble silica combined with lime is noted, but no information is given as to any practical way of ascertaining its presence; and it is very rightly pointed out that the chemical analyses of brick-earths would be far more useful if the amount of free silica were given, as distinguished from that which is in chemical combination with other substances. The operations of the brick-maker are then referred to, and the method of forming clamps and kilns, but we are rather surprised to find that there is no description of any one typical brick-moulding machine.

It is stated that bricks should always be laid with the frog uppermost, but we do not agree with this in the case of over-sailing courses, as if the bricks are laid with the frog downwards in such positions, the effect of a throat is obtained, and the water will be prevented from running down the work. A good diagram is given of the Hoffman kiln, which is the adaptation to brick-making purposes of the Siemens regenerative furnace. As regards the prices of the various descriptions of bricks, we really think they would have been better omitted, as one season is no criterion for another, and, as a matter of fact, on comparing the prices given in the present edition with those in the former one, we find that in the majority of cases they are less than half. With reference to rubbers, we quite agree that they are not nearly so durable as the purpose-made moulded bricks, but the great difficulty with the latter is that it is almost impossible to get the joints and arrises quite true; in fact, they have the same drawbacks, in a minor degree, as terra-cotta.

A table is given of the total absorption of water by different kinds of bricks, but this is really not half so important as the rate of absorption, because bricks in ordinary situa-

\* "Notes on Building Construction," arranged to meet the requirements of the syllabus of the Science and Art Department of the Committee of Council on Education. Part III. Materials (Advanced Course and Course for Honours). Second edition; revised and enlarged. London: Bivingtons. 1899.



ions are not exposed to constant but only to intermittent wetting, and, *ceteris paribus*, those bricks which take up moisture most slowly are the best for building purposes.

With reference to the strength of brick piers, we notice that the short table given in the previous edition has been omitted, and some tests by Mr. Kirkaldy substituted; but it is a pity that the authors have not consulted some of the recently-published notes of such tests that have been made in the United States by Colonel Gillmore and others. These give a far higher compressive strength for brick piers than is given by Mr. Kirkaldy; and, moreover, we hold strongly the opinion that in a work of this kind it is worth while to give minute details of the tests,—the mere statement that at so many tons “failure began,” and at so many “crushing took place,” is not sufficient. There is a curious little piece of carelessness on the page where these tests are given, as a note alluding to Hurst’s “Handbook” remains, whereas the remarks in the text to which the note refers are omitted. We must also complain of the inadequacy of the references given. It is simply annoying to be referred in a note to Page’s “Economic Geology,” or to Latham’s “Sanitary Engineering,” without chapter, page, or anything by which the reference can be verified. The same thing occurred in the previous edition, and the omission might have been very easily rectified.

Firebricks and terra-cotta are next dealt with, and a reference is made to the new fire-proof material now so largely used in America,—porous terra-cotta, a mixture of clay and sawdust, or some such material, which, when baked, is consumed, leaving the terra-cotta very light, strong, and porous. The section concludes with a fairly complete account of drain pipes and roofing tiles.

The third chapter,—on limes, cements, concretes, &c.,—has been revised more thoroughly than any other portion of the book, and it now gives a most valuable mass of information on these materials. The constituents of limestone are described, and those which tend to give hydraulic properties are clearly defined, and the various kinds of limes resulting from the calcination of the stone, with their properties, are minutely dealt with. We think the authors might have gone further than they have done in condemning the use of fat lime for mortar. They say that mortar made with it never sets except to the extent of a thin surface crust, and that it attains no strength under any circumstances, with which we entirely agree; but they only say it is unsuitable for making mortar, “except for the walls of outhouses and for other similar positions”; what the other outdoor positions are for which fat-lime mortar is suitable we cannot imagine. An admirable account of the natural and artificial cements is given, and it would be difficult to find in a more concise form all the material matters connected with the manufacture of Portland cement, its properties, and the results on its ultimate strength of fineness, weight, &c. A most useful little table is given of the gauge of wires required for sieves for testing fineness, as it is very truly observed that, although the number of meshes to the square inch is frequently specified, the size of the wire is often not referred to, and yet the orifice of the mesh depends upon this.

Several other tables showing the results of various experiments are given for the first time in this edition, among which we may mention one taken from the “Proceedings” of the Institution of Civil Engineers, comparing the adhesive with the cohesive strength of Portland cement. The difference between the two is material: the cohesive strength is the strength with which the particles of a substance cohere with one another; the adhesive strength is that with which they adhere to other substances. The experiments quoted show that the adhesive strength of Portland cement is greatly increased by extreme fineness of grinding. After all, however, any test of neat cement under exceptional conditions is of much less value than a test of the material

when combined with sand, and used under circumstances as nearly as possible similar to those which occur in actual work, and we are glad to find a table showing the effect of various proportions of sand and of various degrees of fineness in the cement, and the results again go to show that fineness of grinding adds to the strength when combined with sand, although the opposite was the case when it was used neat.

The account of mortars and concretes remains much as it was in the previous editions, and it practically gives all the information needed. A short notice of the use of sugar is added, and it is stated that experiments have proved that the strength of Dyckerhoff’s Portland cement was considerably increased after three months by the addition of from  $\frac{1}{4}$  to 2 per cent. of pure sugar, but that more than 2 per cent. of sugar made the cement useless. In the remarks on concrete, the desirability of having as few voids as possible is very rightly insisted upon, and the method of actually ascertaining the cubical contents of the voids in a certain amount of any aggregate is clearly shown. We have very little doubt that the French method of mixing mortar first and then combining the aggregate with it makes the best concrete. With reference to the compressive strength of mortar and concrete, we must again express our regret that the results of some of Colonel Gillmore’s experiments are not given.

A description of various kinds of mortar and concrete mixing machines is followed by copious notes on the action of foreign constituents in limestones and cements, and very full practical directions for making chemical analyses are given. We have next a description of the various plasters used in internal work, such as plaster of Paris, Keene’s and Parian cements, and their uses, as well as the materials used in ordinary plastering, and their proper composition. Selenitic plaster, stucco, artificial marbles, papier maché and fibrous plaster, whitewash and distemper, and the different sorts of asphalte in ordinary use, are referred to, and this most useful chapter concludes with a table giving the quantity of materials required for the various plasterer’s operations, and the approximate weight of limes and cements.

The next chapter, comprising a hundred and twenty-one pages, treats of the various metals, and by far the largest portion, as might be expected, is devoted to iron. This metal now enters so largely into the construction of all buildings of any size that an accurate knowledge of its nature and uses is most essential for a student, and we think he will find here nearly all the information which he requires. The different kinds of ores are described, and the process of smelting and the effects upon the metal of using the hot or the cold blast in the furnace are compared. The characteristics of the material known as cast iron, wrought iron, and steel are discussed very thoroughly, and it is most properly observed that, with regard to the two last-named, they merge so imperceptibly into one another that it is extremely difficult to define accurately where steel begins and wrought iron ends. It depends entirely upon a minute difference in the percentage of carbon, and we feel confident that if many of the rolled joists which are called steel by the manufacturers were carefully analysed they would be found to contain less than  $\frac{1}{5}$  per cent. of carbon, which, according to Dr. Percy, is the limit at which iron may be regarded as steel. When it contains 2 per cent. of carbon or more it enters into the condition known as cast iron. The difference between the two kinds of cast iron, grey and white, is noted, as also the fact that these different forms depend upon the presence of carbon in intimate chemical combination, as in the white variety, or in a free state, as in the grey; but it is scarcely strictly accurate to say that grey cast iron can be converted into granular white cast iron by melting and suddenly cooling it, as it is only the outer skin, and not the inner core, which is thus affected. We do not think the authors have been quite so clear as they might

have been in pointing out the defects of cast iron for constructional purposes, as there can be little doubt that even for columns where considerable length is required, in which case there is a liability to failure from bending wrought iron is largely superseding cast. Wrought iron is very fully dealt with, and the different ways of testing its quality are described; but we cannot help regretting that in the tables which are given no notice is taken of the very interesting series of experiments made by Commander Beardslee, of the United States Navy, or of the more recent tests at the Watertown Arsenal. Steel is treated in the same exhaustive manner, and its various forms and characteristics are fully explained. One of the most useful portions of this chapter is that treating of the working stresses and the limit of elasticity of iron and steel, and we should have been glad if the authors could have incorporated here some of the more recent results obtained by Professor Bauschinger. The other metals described are copper, lead, zinc, tin, and the various alloys, such as brass, bronze, bell metal, pewter, solder, &c. Practically all the information required by a student on these materials is given, and the chapter concludes with some most useful tables of weights, resistances, &c.

Timber is the next subject which claims the attention of the reader; the processes of growth of the exogenous trees are clearly described, the characteristics and defects of timber are pointed out, and the practical differences between the soft and the hard woods. The various forms in which timber comes to market are noted, such as balks, planks, deals, battens, &c., and the different appearances which distinguish Norwegian, Swedish, Russian, and American, while the purposes for which each kind is adapted are succinctly stated. In the description of elm and its uses, we notice that nothing is said as to its suitability for stable-fittings. We are rather surprised at this omission, as we believe no better wood exists for lining loose boxes or stall divisions, or for mangers where iron is not used. This is in consequence, not only of its hardness and toughness, but of its peculiar flavour, which prevents horses gnawing it to anything like the extent they do deal. A large number of the marks and brands upon timber are enumerated, and, in the absence of marks, the particular points to which attention should be directed in selecting it are clearly described. The various methods of seasoning timber, the symptoms of decay, and the means which have been adopted for preserving it are detailed. Tables showing the weight, strength, &c., of timber are given; but these are all old, and we must repeat that we much wish that the more recent experiments of Mr. Lanza and others in America had been consulted. Nearly all the information in this chapter is taken from the works of Tredgold, Hurst, Laslett, and other standard writers.

The chapter on paints and varnishes is carefully compiled; a description is given of the various bases, vehicles, driers, colouring matters, &c., and of the way to distinguish good from bad. The numerous patent paints introduced of recent years are nearly all alluded to, and their various properties pointed out. The different gums which form the ingredients of varnishes are mentioned, and some useful recipes are given for varnishes, stains, &c., and also for washes for removing paint.

The different kinds of glass are described and the weight, thickness, and size of sheets are tabulated. The method of printing wall-papers is discussed, and a very useful test for the presence of arsenic in them is fully given, and the book concludes with the description of a number of nondescript materials, such as glue, size, putty, nails, screws, &c. A short note is added on the physical properties of materials and their resistance to stresses and strains.

We consider this volume the most useful of the three which have as yet been published, and the value to the student of such a work of reference is incalculable. The task which the authors set themselves was a gigantic



one, and they have, on the whole, acquitted themselves of it admirably. We should have been glad to conclude our remarks here, but there is one matter in connexion with this new edition of which we must seriously complain. There are a large number of cross references in the text and in notes to other pages of the volume, and the errors in these references are so numerous as to be quite inexcusable. We counted more than fifteen in the chapter on metals alone. This is really a serious matter for the student, as he will waste much time in endeavouring to verify the reference, and it is simply the result of gross carelessness, for, on investigation, it turns out that in almost every instance the numbers refer to the pagination of the previous edition, which does not agree with that of the new one. We hope that this blunder will be rectified as soon as possible.

## NOTES.

**T**HE Report of Major Marindin, pursuant to the long sitting to hear applications from various companies for concessions to undertake the lighting of different districts of London by electricity, is so important in its bearing on the future lighting of London, and as being the first step towards what will eventually be such an immense undertaking when contemplated *en masse*, that we prefer to take time for fuller consideration of the subject before dealing with it at all in detail. The general conclusions or summary of Major Marindin's report are already made known to the public, but his recommendations as representing the Board of Trade have now to be considered, and the degree and manner in which they can be acted upon determined, by the London County Council. In the principle advocated by Major Marindin, of not allowing concessions to more than two companies over the same area, we are disposed to concur. Competition is a valuable influence, no doubt, in reducing cost to the public and inducing efficient service on the part of the companies; but it would be bought too dearly if we were to add, further than can possibly be avoided, to the number of agencies which can already claim rights to open and interfere with the streets. Between water, gas, underground telegraph wires, and pavement and sewerage repairs, we are troubled enough now in this respect, and the inclusion of several rival electric lighting and power companies would be a formidable addition to the present complications, though the requirements of electric lighting companies would not make such demands on space or depth of excavation as water and drainage. Major Marindin's recommendation that the mere objection of the local authorities in an area should not suffice to exclude a company from that area, unless the authorities themselves express the intention of providing for electric lighting, is well judged. It would never do for a conservative Vestry to have the power, merely because its members disliked electric lighting or had vested interests that were threatened by it, to deprive the residents within the area of the use of electric light. In this and other respects Major Marindin's recommendations appear to be framed with a due regard to the advantage of the greatest number.

**T**HE Executive Committee of the Railway and Canal Traders' Association are impressing upon their members the necessity of closely watching the proceedings which will now shortly commence before the Board of Trade in reference to the objections which are being lodged against the new maximum rates, and also warning them against relying upon the statements made by railway officials as to their intentions with regard to the existing rates. The case is presented in a somewhat peculiar manner, the meaning of "maximum rates" being rather confused and obscured. "It should be borne in mind," we

read, "that it is with the proposals of the companies as they are framed, and not with their managers' intentions, that traders have to deal; and further, that any assurance from the companies as to existing rates would be worthless, as the Act of Parliament which in every case must be passed to confirm the Companies' proposals will override all private agreements and undertakings relating to rates." This seems equivalent to saying that the Act will not only authorise certain maximum rates, but will also compel the railway companies to charge them. At the last half-yearly meeting of the Midland Company, the Chairman told the shareholders that the Act was not intended to regulate the rates actually charged in practice, except as providing a maximum which was not to be exceeded. Now, without placing blind confidence in official assurances, this may surely be accepted as a correct view of the design of the new legislation; and, while it is essential that the maximum should be moderate and reasonable, it is desirable that traders should recognise that for the railway companies to be pinned down to too low a figure would not, in the long run, be beneficial to the community. It is clear that a little latitude may be really essential to the profitable working of railways, and it is obviously not their policy, whether they have given assurances or not, to charge "limit" rates directly a maximum is fixed. The price of coal is one thing which, to our mind, gives force to this argument. The railway companies are very large consumers of coal, and we learn from the *Colliery Guardian* that an increase has taken place in the price charged to railway companies for steam-coal of no less than 33 per cent. on the rate contracted for last year. It is not at all likely that such an advance will be maintained, but these things naturally suggest the possibility of great disturbances in prices, which would force up the value of labour and of nearly all commodities, and it would be hard upon railway shareholders if the carrying industry alone were to remain tied down to unproductive rates. Of course the amount of latitude to be given is a question to be carefully considered both by the Board of Trade and Parliament, and we quite agree with the Railway and Canal Traders' Association that this stage of the proceedings should be closely watched.

**T**HE proposal which has been made to build the new National Portrait Gallery on the vacant land in the rear of the National Gallery, thereby for ever preventing the possibility of extending the National Gallery, is as ill-advised as if Mr. Shaw-Lefevre had been at the bottom of it. But the alternative supported in the *Times* of Monday, to place it as an annexe to Kensington Palace, is just as absurd in another sense. It would interfere with nothing there, certainly, and no one would interfere with it, for it would be so far out of everyone's way that no one would take the trouble to get to it. Besides, the site would be directly in contravention of the conditions under which the gift was made, and the evident object of which was to prevent the pictures being taken off to Kensington. It is to be hoped the anonymous donor will have some voice, at all events in the way of a *veto*, in the selection of the site, or the Government will be pretty sure to nullify the value of his gift by some blunder in their manner of applying the funds thus generously placed at their disposal.

**I**N the last issue of the *Ἐφημερίς Ἀρχαιολογική* (iii. 1 and 2) two plates are devoted to the publication of the frescoes recently discovered at Eleusis. The paintings, it will be remembered, were found in a building, apparently a dwelling-house, near the greater Propylæa. The discoverer, Mr. Philios, considers that the greater Propylæa were a Roman imitation of the Athenian Propylæa, and dates both them and the adjacent house, with its paintings, as of the time of Hadrian. Wall-paintings in Greece are so rare that,

though the remains are small, they are of great value. The best-preserved fragment is a figure of Zeus seated,—we say "seated" by courtesy, for the god is in a sitting posture, and there is an elaborate chair, but so faulty is the perspective that he is sitting on nothing but air; he holds a roughly-drawn Nike in his hands, and his feet rest,—all the support he has,—on a stool; the left hand holds a sceptre, and the whole conception is distinctly borrowed from the Olympian Zeus. This picture, like the others, is enclosed by lines, and is essentially a panel picture. On the panel, right and left, are painted respectively two bulls and two pigs. We are reminded that the ancient name of the painter was *Ζωγράφος*. The colours employed are still very vivid,—purple, brown, yellow, two shades of red and emerald green, are all well preserved. One of the plates gives a general view of the two walls, the other an enlargement of the Zeus and animal panels.

**A** BUST of Augustus, of great value, was found during the excavations for the construction of a drain near the site of the Golden House of Nero. The bust will be added to the collection of busts of the Roman emperors and empresses, arranged in chronological order around the room called the Hall of the Emperors, in the Museum of the Capitol.

**T**HE Roman Municipality is at present thinking of forming a new Mediæval museum or collection of coats-of-arms, in the Palace of the Counts Degli Auguillara (a branch of the Orsini family), at the extremity of the modern "Ponte Garibaldi." The palace, built in the fourteenth century, still retains a pretty lodge, the tower of fine brickwork, the Guelph windows, and the door with the coat-of-arms of the Auguillara family. Certainly this new institution will be interesting in regard to the Mediæval history of Rome and Roman families.

**D**R. WALDSTEIN has lost no time in "publishing" the newly-discovered head of Iris, which he was so fortunate as to be the first to identify. The discovery of this head may indeed be considered, as he says, the "crowning event in a series of fortunate finds." It is to appear in the next number of the *American Journal of Archaeology*, of which a preprint has just reached us. The head, it will be remembered, was found just where the careful masonry of the wall of Cimon joins with the wall of nondescript character which is just now in process of being levelled. This wall, which has usually been considered barbarian work, Dr. Waldstein holds to be, in all probability, Byzantine. He further believes that this same wall may contain fragments of the central figures of the east pediment, which were not extant when Carrey made his drawing in 1674. We can only hope that his prophecy may speedily be fulfilled. The head of the youthful Iris is of great beauty, but as a cast may now be seen in its right place in the British Museum it need not be described in detail. It is interesting to note that the head is turned to the left, not to the right, as in the restoration of Stuart. The motive is thereby made more appropriate, as Iris watches the approaching procession.

**I**N making the foundations of embankment-walls along the River Tiber, in the Prati di Castello, near the iron bridge of Ripetta, two statues of Greek marble were found last week, of which the one represents the goddess Pudicitia, and the other Venus. This second statue is a good imitation of the celebrated statue of the Venus of the Capitol. The statues have been removed to the new National Museum at the Thermæ of Diocletian.

**A**CCORDING to *L'Architecture*, M. Lasteyrie has been making some painful disclosures in the pages of the *Ami des Monuments*, the organ of the Paris Society for the Protection of Ancient Buildings, in regard to the extent to which restoration of ancient buildings and sculpture has been carried in



some parts of France. Among other things M. Lasteyrie avers that not long since a distinguished archaeologist, in a treatise on French sculpture in the thirteenth century, had instanced as examples, and even had illustrated by photogravure, a group of figures from the portal of Notre Dame at Paris, which were in reality reproduced by modern carvers under the direction of Viollet-le-Duc, thirty years ago: a typical example of the confusion of artistic history which may result from wholesale and "learned" restoration.

**MR. SHAW LEFEVRE'S** Westminster Abbey Bill, as our readers may have noticed, has been withdrawn in consideration of the probability that the Government will institute an independent inquiry into the subject of Westminster Abbey burials and monuments. It is to be hoped this does not mean a repetition of the absurdities which characterised the Westminster Hall Committee, and that the Government will endeavour to find a chairman and a Committee who know a little about architecture.

**MR. JUSTICE NORTH** (Chancery Division of the High Court) has sanctioned an order for applying the purchase-moneys paid by the Metropolitan and District Railways to the building of a new Weigh-house Chapel. The trustees have arranged to lease from the Duke of Westminster, for a term of ninety-nine years, at a peppercorn rent, a site in Duke-street, Grosvenor-square. Messrs. Shillitoe & Son, of Bury St. Edmunds, builders, have given a tender, amounting to nearly 25,000*l.*, to build a chapel and parsonage-house, together with schools, &c., after the designs of Mr. Alfred Waterhouse, R.A. The first Weigh-house Chapel was constructed over the King's Weigh-house in Love-lane, Eastcheap, circa 1697, for an Independent congregation, under the ministry of Thomas Reynolds. That community represented a following of the Reverend Samuel Slater, who on the passing of the Act of Uniformity had relinquished, in 1662, his cure at St. Katharine-by-the-Tower. In 1834 was laid the foundation of a more commodious chapel on the western side of Fish-street-hill, to receive the larger flock of the famous preacher, Thomas Binney, in whose memory an organ and a window were subsequently set up. On Wednesday evening, March 28, 1883, a valedictory meeting, under the late Mr. Samuel Morley's presidency, was held in this chapel. The fabric was shortly afterwards demolished for the purpose of completing the Inner Circle Railway line. Its site is now covered by Monument Station booking-office. The Weigh-house, in Weigh-house-yard, East Cheap,—standing on the site of St. Andrew Hubbard, or Hubbard, Church,—belonged to the Grocers' Company, to whom, as being then dealers in wool, and to the City, Richard II., in 1383, had granted custody of the "King's Beam" on Wool Wharf. In later years the Grocers kept the "beam" at the Cornet's Tower, by Bucklersbury, used by Edward III. for his exchequer, then at Cornhill, whence it was removed to East Cheap. The labourers here were known by the style of "tackle," as distinguished from "ticket," porters.

**D. R. PAGE'S** Report to the Local Government Board\* (March 15) on the prevalence of enteric fever at Spennymoor (County of Durham) notes serious defects of ventilation in the drainage of the district. "The upper portion of the main sewer was unventilated, and the only houses invaded in this locality, two in number, were among the few having direct communication with this unventilated section. Considerable pains had evidently been betowed upon details of house drainage in each instance, as to severance of waste-pipes from the outside drains, but each had served, by means of its soil-pipe from an indoor water-closet, to ventilate the public sewer upon the premises . . . But it is more especially in association with prevalent excremental nuisances throughout the dis-

trict that enteric fever in Spennymoor and Tudhoe Grange has occurred. The midden privy is in general use, and accumulations of filth and refuse were met with close to dwellings under conditions which could not fail to be injurious to health." Dr. Ballard's interim report (same date) to the Local Government Board on an inquiry at Middlesbrough and its neighbourhood, as to an epidemic of so-called "pneumonia," but which was in fact a specific "pleuro-pneumonic fever," records the prevalent opinion in the district that it was due to the inhalation of fine dust proceeding from a new industry established at the North-Eastern Steel Works, namely, the pulverisation and sifting of the basic slag resulting from the manufacture of steel by the Gilchrist-Thomas process; and some of the medical men in Middlesbrough were inclined to entertain this notion. Dr. Ballard, who here deals mostly with purely medical rather than sanitary analysis, adopts the conclusion that exposure to "slag dust" was obviously not the primary cause of the malady. "But among assisting causes of attack by the specific disease may be mentioned exposure to the inhalation of this and other kinds of trade-dust, and also exposure to chills or unusual bodily fatigue."

**WE** regret to find that Mr. F. Edwards, whose important work in the improvement of grates is known to many of our readers, is under the necessity of appealing for charitable aid. We have received a circular or memorial calling attention to the facts of Mr. Edwards's case and asking for assistance from the public. We should suggest that Mr. Edwards's friends—who have, if we remember right, previously made similar appeals on his behalf—would take a wiser course if they used influence to get Mr. Edwards's case represented to Government as one with a reasonable claim for a pension. Mr. Edwards showed in earlier life much energy and talent in the branch of study and manufacture to which he devoted himself, and was the author of improvements in grates which are of public value; he appears to have met with commercial reverses mainly brought about through special adverse circumstances; and it appears to be a case in which the relief of a pension from Government might very well and suitably be bestowed.

**A** SMALL exhibition of American Decorative work, and of etchings by the Society of American Etchers, has been on view at the rooms of Messrs. Johnston Norman & Co., in New Bond-street. The collection of etchings includes some fine work. The etchings entitled "An Old Song" by Mr. W. Sartain (after a picture by Mr. Percy Moran), and "John Alden's Letter" by Mr. C. Y. Turner, are examples of highly-elaborated work in pure line, and very fine work of their class. Among the less elaborated works, showing those broad contrasts of light and dark in which to our thinking the special power of etching consists, a particularly fine example is Mr. Carleton T. Chapman's "White Wings," a study of ships and their white sails reflected in the sea, which is full of light, and in which much is told in a few strokes, the water especially being exceedingly well treated. Among smaller etchings of the same class Mr. Parrish's "A Gale at Fécamp" and Mr. Platt's "An Atlantic Dock" may be mentioned. The "Low Tiles," decorative tiles with subjects in very low relief and with a high glaze, by Messrs. J. G. and J. F. Low, are very effective as decorative material, with fine tones of colour. Some of the large tapestry subjects executed by "the Associated Artists," as portières or screens, are finely designed and decorative in effect: two embroidered curtains by Mrs. Wheeler are especially good, one called "Fleurs-de-lis," not representing the conventional form so-called, but a fine free study of leaves and flowers of lilies, and one called "Roses in Net," which represents heaps of roses apparently suspended in nets of gold thread which is worked over the surface; a little too realistic, perhaps, but certainly bright and striking in effect.

**WE** have frequently called attention to the improper offers of commissions which are often made to architects by patentees and manufacturers anxious to get their inventions introduced into specifications. The "Acme Wood Flooring Company" seems to have hit on a more ingenious and refined method for enlisting the commercial interests of architects in the employment of their patents. They endeavour to work on the feelings of the architect by issuing a circular setting forth the advantages of the Acme Wood Flooring system, accompanied by a letter, stating that "the Directors for obvious reasons would prefer to allot the bulk of the Company's shares to members of your profession," adding that "the very profitable nature of the business will be at once apparent to you." Thus the architect to whom shares are allotted will experience the serene satisfaction arising from a consciousness that he is feathering his own nest every time he writes in a specification—"All floors to be laid with the Acme Wood Flooring Company's Immovable Acme Solid Wood-Block Flooring." This is certainly a more artistic method than the gross offer of a commission. The "for obvious reasons" is delightful.

#### ARCHITECTURE AT THE ROYAL ACADEMY. IV.

1849. "St. John the Baptist Church, Wimbledon; design for completion, with tower and spire": Mr. T. G. Jackson. A drawing in brown ink and lightly tinted in brown, showing a portion of the church and a fine massive-looking tower in late Decorated style, exceedingly plain in the lower portion, and with wall-mullions and two long windows on each face in the upper portion, with crocketed canopies running up into the battlemented parapet of the tower. The south-east angle of the tower is accentuated by an octagon stair turret. A short slated spire grows from the top; one does not feel sure whether the tower would not look better without this addition. The method of tacking on a clock-face on one side of the tower and half-covering two of the small openings in the lower part, as if it had been forgotten and put on afterwards, where it could, strikes us as more whimsical than architectural. As a pendant to this drawing, in the corresponding position at the other side of the wall, is hung No. 1878, by the same architect; "Zara, Dalmatia; the campanile of the Cathedral as it is proposed to complete it." This drawing, a lithograph of which will be found in the present number, we erroneously alluded to in our first article on the architectural room as a view of the campanile at Zara; it appears however that the campanile was never completed, and it is proposed to complete it now from the design of Mr. Jackson, who we may safely say is the first English architect who has ever been called on to complete an ancient church in Dalmatia. The drawing is a clear, well-executed water-colour, having however a rather "monochrome" effect at first sight from the mass of brown in the building, which might have been treated with a little more licence as to colour with advantage to the pictorial effect. The illustration will show how the architect has adopted the Romanesque style of the existing portions of the church. The little bits of decorative inlay here and there on the tower have a pretty and piquant effect.

1852, "Side of Billiard-room": and 1879; "Ceiling of Billiard-room": Mr. G. Aitchison, A.R.A. These two, which represent the decorative scheme for one apartment, must be taken together, and ought to have been hung together. The wall decoration shows a massive and richly-decorated oak wainscot to two-thirds the height of the room: the lower portion in plain paneling, the upper with richly-carved panels and frieze, with profile heads in bas-relief in the centre portions, in medallions with a gold ground; pilasters with masks and terminal figures divide the room into bays. There is a large and heavy cornice which ranges with the cornice of the mantelpiece in the centre; and over this a kind of attic with further carved pilasters and frieze; the upper face of the cornice forms a shelf for the display of antique glass, &c., the effect of which is very well rendered in the drawing. The mantel has carved columns of Renaissance type, with an overmantel raised above the main line of the wainscot, with

\* Eyre & Spottiswoode, London; A. & C. Black, Edinburgh; Hodges, Figgis & Co., Dublin.



colonnettes and niches holding glass and ceramic objects. The wall-paper above is of a semi-realistic foliage design, gold on buff, each repeat being, so to speak, right-handed, not radiating from a centre, so that the eye is rather carried along from left to right; the repeats are carefully arranged so as not to synchronise with the divisions of the wainscot. A medallion cornice with a good deal of gilding separates this composition from the ceiling, which is nearly white, with only a little delicate tinting; it is divided out by broad ribs into panels which are filled with foliage design. The combined effect of wall and ceiling ought to be very rich and effective, and the ceiling is treated in such a way as to harmonise with the rich and massive treatment of the wall without heaviness in colour and consequent loss of light.

1854. "Design for Country Mansion": Mr. T. Locke Worthington. A picturesque design for a house with multilined windows and little decoration; the plan has two projecting wings in front, with a recessed portion between, the wings being connected on the ground-floor level by a low story building forming a terrace walk over, with steps rising through the centre of it for access from the outer door to the door leading into the hall. This effect of ascending through a stair-well in the terrace is not very good; it is a kind of planning of the entrance only suited to a house on a much larger scale and where there is more space than shown here.

1861. "House, Palace Court": Mr. Leonard Stokes. A charming pen-and-ink drawing bearing the signature of Mr. C. E. Mallows, in a style admirably adapted to give to this old-fashioned looking house the desired antique effect, and persuade the spectator that it is a house about a century old, and not, as it probably is, a perfectly new one. The house is eminently home-like in appearance, and the projecting bay on the first-floor, with its row of low windows with small panes, is an agreeable feature externally and probably assists to make a very pleasant room internally; but if the house were shown in a plainly-drawn elevation and plan, there would really be very little to call architectural design in it; and it is a great question whether it would have been hung at all if presented in that form. It is obviously hung for the drawing; but this raises the question we have suggested before,—is the Architectural Room intended to illustrate drawing or to illustrate architecture? And if a drawing is hung solely for the sake of a picturesque drawing, ought not the draughtsman's name to be given in the catalogue, when it is really his work that is hung and not the architect's? How many of the drawings in this room are the work of those whose name they bear? Of course in the present case it is well known that the architect whose name is appended is perfectly competent to draw for himself; but we know also that there are many cases in which the person whose name is attached to the work in the catalogue could not have made the drawing himself if his life had depended on it, and it may be doubted whether in some cases even the design, as well as the drawing, is not the work of another person than the one named in the catalogue. Thus a great portion of the Architectural Room is a kind of respectably got-up sham; we do not know whose work we are really looking at. It would have a very wholesome effect if the Academy would try just for one year the experiment of announcing that drawings would be catalogued in the name of the person who executed them. The result might be amusing and instructive. The titles could be given in this kind of way:—"Church to be built by Mr. Fyve Persent . . . A. Lightpen." Then we should get at the facts of artistic ownership. The reflection is only *apropos* of drawing No. 1861 so far as this, that it is an instance of a building of very meagre architectural interest hung simply for effective drawing. Now, we have seen drawings of buildings of much more architectural interest than this, and quite adequately drawn, which have been refused from this year's Academy. In other words, drawing counts first, architecture is only of secondary importance: and that is a wrong principle. From which not altogether uncalculated digression we will proceed to

1865. "New Theatre, Cambridge Circus": Mr. T. C. Colcutt. This is rather an innovation in theatre fronts: that is to say, it is a building of which it would be popularly said that it does

not look like a theatre, not having the columns or pilasters and "classic" gimcracks which are usually found to characterise a theatre design. The drawing, a pen perspective, shows the face towards the Circus, which takes the curve of the Circus frontage. The building has a solid bastion-like basement rounded off at the angles, and with a large octagonal turret partially corbelled out, at each extremity of the front, with a rounded cupola termination rising above the cornice line; smaller corbelled-out turrets break the line of front in the centre portion, and beneath the space included between these are the arches which give access in the basement to the main entry. The general composition is that of horizontal ranges of windows, arcades, &c., stopped by the two large angle turrets, and the general effect is both rich and monumental looking, the solid basement especially giving the building a look of monumental massiveness not generally characteristic of theatre designs. But it was a great mistake to put a visible gable termination to a front with a curved line of plan. Nothing can make these crippled lines of the gable look well; it should have been masked behind a screen or façade. No plan of the theatre is given. From its height above the ground we presume this theatre is not built on the now generally favourite system of having half the auditorium below the ground.

1867. "Cottage Block for S.W. Railway at Bishopstoke": Mr. Ralph Nevill. Hung very high, but noticeable as an attempt to make railway *employés'* cottage blocks picturesque; an attempt very seldom made, railway companies being generally content with a long brick wall with holes in it for housing their workmen. That something better is done in this case is creditable to the Company as well as to the architect.

1869. "Design for a Church": Mr. W. H. Bidlake. We have already referred to the merits of this drawing, which is indeed a masterpiece of picturesque architectural drawing in pen-and-ink line, both for the delicacy and brilliancy with which the detail is indicated, and for the tone and breadth of effect obtained in the drawing as a whole. It has other merits than mere draughtsmanship, however; there is much power and picturesqueness in the design, which shows a view from the north-east of a church standing on broken ground sloping downwards to the eastern end. An octagonal apse with a very massive basement (evidently containing a crypt) is seen at the eastern end, and to the right of it a picturesque tower with large lucarned windows above, the whole lower part consisting of a piled-up mass of perfectly plain masonry. This rock-like mass of building gives the more effect to the rich treatment of the upper part of the apse adjoining, and of the nave further on. It is not very obvious how the octagon transept with its small window high up, projecting beyond the base of the tower, would be utilised internally, and it would have been better if the author had added a plan showing the basis of his composition, which we conclude is a purely imaginary one, but one which indicates a great deal of feeling for the picturesque element of architectural composition.

1870. "Folton Manor House, Yorkshire": Mr. E. J. May. A very scratchy tinted drawing of a picturesque irregular rustic-looking house, the right-hand portion set on at an oblique angle, and a porch and bay, with gable over cleverly got in at the angle. The lower half of the sheet is occupied by a large plan, showing that the irregularity of the line of plan has been made the occasion of some internal picturesque-ness of nooks and angles in the hall, and practically the plan is well arranged. The author is to be commended not only for making plan an important feature in his drawing, but for also indicating the points of the compass on the plan, an important element in regard to the plan of a house which is generally entirely omitted in Academy drawings, even where a plan is given. On the other hand, while deprecating the hanging of drawings for mere draughtsmanship, we must say that this drawing, with its roughly scratched lines and green tufts of bushes (like the imitation trees in a Noah's ark toy), is too rough and careless to send for exhibition, and amounts to a kind of disrespect to the public.

1872. "A Fountain against the Wall of a Building": Mr. Arthur R. Jemmett. This looks like an École des Beaux Arts competition design: it shows a Classic composition, on a massive slightly-battering surbase, with coupled

Ionic columns flanking the centre, and pilasters at the outer angles. Between the columns is a circular-headed alcove with two nude figures (in bronze?), one reclined and the other standing, water pours out from the rockwork beneath into the fountain basin below. Above is an attic with a centre pediment with caryatides at each side balancing the columns below. At the sides, between the pilasters and columns, are medallions with busts, and square-headed alcoves with bronze vases. On pedestals on the rim of the basin below are four draped figures holding lamp standards, these are well put in and have a graceful effect. The composition is made up entirely of familiar and commonplace elements, producing some effect from the manner in which they are grouped and drawn.

#### PICTURES AT THE PARIS SALON.

The Salon of 1889 includes 2,271 pictures, about 300 less than last year; and, as before remarked, is held under great disadvantage this year from the more than rivalry of the great Exhibition. Comparing the modern collection with the retrospective exhibition of the Champ de Mars, one is led to the conclusion that French painting during the last two or three generations has not shown, in what the French call "La Grande Peinture" the same progress which has been shown in landscape and *genre*. After having, in the Palais du Beaux-Arts on the Champ de Mars, looked at the "Sacré de Napoleon" by Gérard, which has been exhumed from Versailles for the occasion, or the "Battle of Taillebourg" by Delacroix, and other important historical paintings there exhibited, one feels it a great descent to the large "Fédération" by M. Henri Martin which meets the eye in the vestibule of the Palais d'Industrie; an immense canvas of what may be called very loud colouring, the crudity of which is the more accentuated by the habit of this young painter of placing his colours in juxtaposition like a mosaic. The result is a *mélange* irritating to the eye, and out of which it is by no means easy to pick the motive of the composition.

The Sorbonne decorations include four pictures, of which the most important is that by M. Chartran, representing a scene from the siege of Metz in 1552, where Ambroise Paré, the celebrated surgeon of that day, is trying on an amputated limb his ligature for the arteries. The patient, with his back to the spectator, writhes in a spasm of pain; the surgeon is alone cool and collected amidst an excited and anxious group. The picture is finely drawn and composed, perhaps rather tame in colour, but it will probably look more effective in its intended position on the grand staircase in M. Nenot's building. The "Rollin" of M. Flameng, who represents him standing and conversing with some young priests in the court of the Collège de Beauvais, is not equal to his triptych of last year. The scene is painted in a prevalent heated tone of colour which will harmonise ill with that of the first painting in this decorative scheme. M. Lhermitte, who is commissioned to decorate the Hall of the Faculté des Sciences, has frankly accepted a subject in modern life as represented by a scene in which Claude Bernard is giving a lesson in vivisection amid a group of students and well-known savants—portraits, and very good ones. This painting, in a broad and grand style, like all M. Lhermitte's works, is not equal however to his paintings of our-door scenes. The same remark would apply to M. Lerolle's "Albert le Grand" at the Convent of St. Jacques, and which is also intended for the Sorbonne. The figure of the monk, in black and white robes, stands out rather hardly against the white walls of the cloister over which the outline of Notre Dame is seen; the figures generally seem rather stiff and destitute of life and movement.

Historical painting, thanks to M. Tattetgrain, counts one very interesting example,—Louis XIV. visiting the battle-field of Dunes eight days after the victory." This is a curious painting, disagreeably realistic in its representation of the carcasses of the horses lacerated by the attacks of crows, and the decomposing bodies of men lying about in the sand, while the King, surrounded by a ragged crowd whom his Guards are keeping off, is smelling some wild flowers as an antidote to the less agreeable smells that abound. It is hardly equal perhaps to his "Magestas" of last year, but M. Tattetgrain is an original thinker whose works, always differing in style and subject, are always of interest.

M. Jean Paul Laurens exhibits a painting to



which a good deal of archaeological study has gone, of a scene in a Spanish convent, where some white-robed monks are making preparations for the amiable duties of the "Saint Office." M. Rochegrosse, who seems to enjoy painting scenes of "blood and thunder," merits thanks for having restricted himself to a smaller scale than usual in his representation of the Medieval scene celebrated as the "Bal des Ardents," when Charles VI. was burned with his courtiers. It is a disagreeable piece of gaudy painting, looking rather like a Medieval illuminated design magnified.

M. Urbain Bourgeois, with a ceiling intended for the Hôtel de Ville of Limoges, and M. Léon Glaise, with a large panel painted for the Mairie of the Twentieth Arrondissement, may be said to represent official allegorical painting. The first-named is the best of the two. M. Glaise's painting, supposed to represent "La Famille et le Travail," is a heavy ill-composed work, uninviting in colour, and not promising well for the result of the work which has been entrusted to him: another instance of failure as the result of the competitive system as applied to the decorative painting of public buildings.

A Positivist epoch with little fixed belief, like the present in France, can hardly produce a religious art capable, as in primitive times, of touching the heart, and M. Krug's painting of "Bienheureux J. B." only leaves the spectator indifferent, or asking himself by what miracle of equilibrium this black-robed ecclesiastic can be sustained so far above the ground. The triptych by M. Lehoux, intended for a basilica, is a mistake of a young artist spoiled by mere academical successes. It belongs to an exploded school, like the "Heliotes" of M. François Lafon; while M. Pierre Lagarde, in his vision of "St. Jean de la Croix," continues to produce *pastiches* of the early Renaissance painters, mere imitations without the naïve charm of sincerity which belongs to the genuine works of this period.

Of all the religious pictures exhibited, those of M. Uhde alone perhaps, for some years past, have had a genuine attraction, because they present subjects of true human interest, in the illustration of events from Gospel history. For M. Uhde Christ is not the allegorical personage of the old masters, but a real being moving among troops of the poor and the humble who are painted from life. His triptych entitled "La Nuit Sainte" is a new departure in this class of painting, full of charming details, and the cherubs who sing the advent of the Messiah are real rosy children. Among the allegorical religious paintings however, we may mention two as of exceptional interest, the "Madonna" of M. Dagnan-Bouveret, and the "Vierge Noire" of M. Merclé, both beautifully modelled and fine and delicate in colour; but can these really be classed as religious paintings, and not rather as pretty fancies painted without any end beyond that of being pretty?

Perhaps the same reproach, in another sense, may be addressed to M. Falguière, who has unfortunately not been content to remain a great sculptor, but has also appeared as a very inferior painter, and it is difficult to believe that this ill-drawn figure of "Juno" can really be the work of the author of "Diane Chasseresse."

M. Carolus Duran, the most accepted and cleverest painter of fashionable elegance, who is at home in shot silks and velvet, and in all the ornaments of the feminine toilette, has had the odd fancy this year of turning right round into Pagan mythology. His "Triumph of Bacchus" can only be regarded as a momentary aberration on the part of a very gifted artist, who will probably return again to the marvellous portraits which have made his reputation, and leave mythology to M. Bouguereau. It cannot be denied, however, that M. Duran's special qualities are still visible in this new class of subject, and his frenzied Bacchantes are at least full of life, while M. Bouguereau's retain always the same cold correctness of drawing and execution, and absence of sentiment. It is a perfection of mere execution which leaves no room for criticism, but unfortunately it is nothing more. M. Bouguereau is to living nature what M. Desgoffes is to still life.

M. Gerôme's picture is a curious affair: lions, lionesses, and tigers are gambolling in a cage, and in the midst of them is the plump figure of a rosy little cupid girl with a garland of roses; he leans on a gilt bow, a star shines on his forehead, and the animals stop their evolutions to gaze on this strange apparition. This puerile allegory is to signify that even the most savage

natures succumb to the power of love! We take it the real fact was that M. Gerôme wished to paint some animals but did not wish to rank as an animal painter; hence the endeavour to convey an allegory into the work.

There is a great deal of cleverness in M. Gabriel Ferrier's "Bella Matribus Detestata," which is also in a sense allegorical; it exhibits women with their children flying from invaders; but its pathos is only melodramatic; in short, it is an "envoi de Rome," and that is all. Ordinary mortals, who are not well up in their mythology, do not make much out of M. Bukovac's "Aurora mourant dans les bras du Jour," and the "Diane" of M. M. Cazin is not much nearer comprehension, any more than the nymphs of M. Lix and the Idyl called "Printemps" fashioned by M. Blanchard on the model of M. Bouguereau.

Battle pictures are not, comparatively speaking, very numerous this year. Among the number may be mentioned the "Death of General Marguerite at Sedan," an immense picture by M. Gardette; the battle of Froeschwiller, by M. Moreau de Tours, whose work has gained by his adoption of a more modest dimension of canvas; and a scene in the fight at Bazeilles, by M. Sergeant. M. Marins Roy, whose battle scenes are generally good, has not made a success with his "Siège de Puebla." Among other scenes of violence or of combat, the assassination of the regicide bishop Audrein, by M. Hippolyte Berteaux, and the "Combat de Quiberon," by M. Outin, are two well-treated scenes; and M. le Blant's painting of peasants armed with old muskets and scythes, pressing around a priest who blesses their arms, tells the story with great spirit and is well grouped, though rather hard in execution.

The largest and this year the most important section of painting is that of *genre*, which is also the favourite section of work with the public. M. Bouveret's "Brétannes au Pardon," though one of the most remarkable works in the Salon, by a young artist who has shown progress every year, can only be classed as a work of *genre*. It represents a group of peasant women seated on the grass, behind the village church, a very simple scene, painted with the greatest truth of observation. There is the same kind of charm of natural simplicity in the work by M. Roll, representing a group of two young women, a child, and a dog, reposing on sunlit grass on a bright summer day; a scene full of atmospheric effect and fine colour.

The "Jour des Funérailles" of M. Benjamin Constant is a very large picture, representing an Arabian scene in which the accessories play the most important part (if one may so express it). This brilliantly-gifted painter excels in the art of grouping arms, jewellery, Oriental textiles, &c., but all the interest of the picture is in these, and the personages, however well painted, as they undoubtedly are, have only the secondary place. This is too frequently the fault also of Clairin, who this year at least has restricted his brilliant effects of light and colour to the limits of a very small picture entitled "Intérieur d'Eglise à Florence."

M. Besnard's "Sirène" is a young woman with a pretty dimpled face standing on the shore of a rose-tinted lake; an eccentricity of colour which is more astonishing than charming in its effect. As a contrast to this pretentious fantasy take the "L'Homme est en Mer" of M. M. Demont-Breton, representing the wife of a sailor waiting sadly at the fireplace, the red light from which illumines the child sleeping on her knees; a subject of genuine pathos treated by an artist who has devoted herself to scenes of homely family life. "Les Amoureux" of M. Binet is an Idyl translated into modern life. As to the "L'Intimité" of M. Carrière, thanks to the gauze veil which this painter seems to suggest between his pictures and the spectator, there is nothing to be made out of the half-effaced composition. Mr. John Lewis Brown exhibits two charming little pictures, "Promenade de Chevaux" and "Waiting for the others." This latter is particularly good in the painting of the figures of the jockeys, whose costumes make bright spots of colour among the verdure of the landscape.

The "Bord de la Mer" of M. Duez is an agreeable composition, but inferior to his painting of a young woman clad in white whose figure is relieved against a thick mass of foliage which forms a kind of framework to it. Very pretty is Mr. Ridgway Knight's peasant girl watching her sheep in the sunset light. M. Guedry and M. Roger Jourdain have contributed

boating pictures (the latter a Thames scene at Maidenhead), rather gaudy scenes, looking the more so in comparison with the "Un Enterrement en Campagne" of M. Verstraete, a work of great simplicity and soberness of colour. M. Raffalli's "Baveurs d'Absinthe," people in sordid costumes with visages enlivened by indulgence in the deleterious beverage, is horrible in its realism, which the talent of the painter partially excuses; an excuse which cannot be offered for the "Ouvrière Mourante" of M. Pelez. We may mention also, in the same quarter of the exhibition, the Horse Guards at Whitehall of M. Dumaresq, the small rustic figure of M. Albert Fournié, the pretty "Flirtage à bord de l'Eau" of M. Adrien Moreau, and the "Paysannes au lavis" of M. Lhermitte, which however has hardly the solid qualities of some of his former works.

M. Blaize Desgoffes remains the most marvellous painter of still life. Even Dutch patience has never surpassed in fidelity and in ocular illusion the work of this extraordinary artist, who every year parades before us extraordinary reproductions of the treasures of the Louvre. Here, in the midst of textiles of fairy-like delicacy of embroidery, is a Limoges vase, a rock-crystal cup, jewellery, china plaques, and what not; indeed M. Desgoffes is a lapidary or jeweller rather than a painter. But what a contrast between this laboured and minute work, and the mastery with which M. Vollon paints plain copper and stoneware vessels with the warm colour which the light of day gives them. Among the still-life subjects are also to be noticed the partridges by M. Bergeret, the poultry of MM. Claude and Dominique Rosier, the fish of M. Muraud, grapes by M. Thurner, M. Jeannin's hollyhocks, M. Bourgogne's chrysanthemums, and the magnificent "Étalon de Fleurs" by M. Grivolas, a southern artist whose palette reflects the warm tones and bright sunshine of Provence.

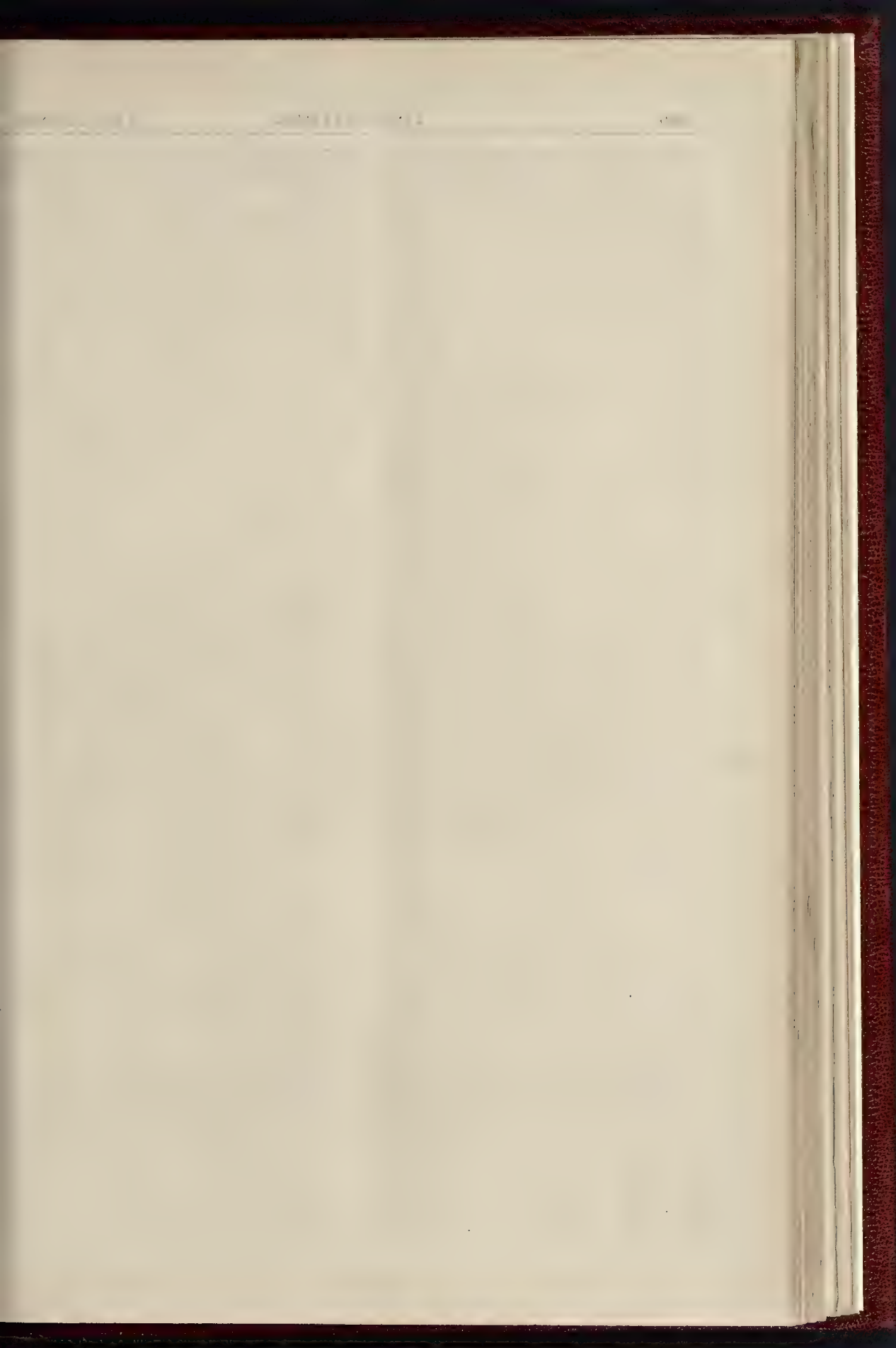
Landscape is the branch of art most flourishing in France at the present day, and presenting most originality, modern painters of this latter part of the century discovering a poetry and a meaning in nature which their predecessors had not a glimpse of. Accordingly the old school represented by MM. Benouville, Curzon, Paul Flandrin, Bellef, Cléret, &c., appears very *démodé* by the side of the Normandy painters and other landscapers in the severe style of M. Demore, the cool shaded pools of M. Péraire, the verdant plains of M. Pelouze, the "Fifi d'Été" of M. Pointelin, the river-banks of MM. Galerne and Zuber, and the red heather of M. Poitevin. M. François alone seems always to keep the same position, and his landscapes from the Vosges country are painted with a power which age has in no way impaired. M. Raphaël does not progress in the right direction, and the prevalent yellow tone of his landscapes is very disagreeable. The Provence landscapers by MM. Allègre, Castie, Sain, Olive and Decanis, on the other hand, are remarkable for the bright atmospheric effect and the manner in which they convey the warm colouring of that pleasant district of sunshine.

For some years past, scenes from Paris itself have become increasingly numerous among the landscapers. Paris offers plenty of subjects, but they mostly require a special talent to treat them successfully. M. Luigi Loir, who was one of the first to set this fashion, exhibits this year a view of the Pont Solferino and the Quai d'Orsay during a flood of the Seine. M. Lesclapart has selected the Ile de la Cité for his subject; M. Pierre Vanthier, the Pont National at Bercy; and M. Alfred Smith, the Place de la Concorde during a shower of rain. M. René Billotte, who makes consistent progress in this class of work, keeps generally to the Parisian suburbs, and this year exhibits two such studies very correctly and carefully painted. It is a pity M. Dumoulin has quitted Paris, which he knows so well, for Japan, of which he exhibits two very insignificant "Japaneries."

Among the landscapers is also to be mentioned a grand Norwegian landscape by M. Normann, with snow-white mountains reflected in a wonderfully clear lake. Among the sea-pieces, one can only name, out of a number, the "Havre" of M. Boudin, the "Bateaux de Pêche" of M. Maurice Courant, the "Soleil couchant sur les falaises" of M. Dieterle, the "Plage de Villersville" of M. Guillaumet, and the sea-side scenes in Holland by M. Mesdag.

Animal painting is represented by a great number of pictures; cows "en pasturage" by MM. Barillot, Dieterle, and Julien Dapré, sheep by M. Charles Jacques; there are also good pictures







HATCHLANDS, SURREY





PHOTOGRAPHED BY MARTIN L. JONES, AT NEW YORK.

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this class by M. Guignard and M. Princeteau. The former, in his "Embarquement des Vesux," has surpassed any of his former work. The latter exhibits an "Atteage des Boufs" in vineyard at Pressoir, a picture painted with vivid and intentional and ostentatious rudeness of execution, but full of life.

In M. Carous Duran's exquisite portrait-painting of two blonde-haired children in dark lace, we find all his old qualities in this class of painting, and are enabled to forget for the moment his mythological errors. Further we come on the last portraits painted by Cabanel; woman in black velvet relieved against a pale ground, and whose hands are beautifully modelled, and a portrait of a young blonde lady in a white dress which the painter left unfinished. These works are examples of Cabanel's turning in the art, and of that incomparable ease and elegance which he imparted to his miniature portraits by which he chiefly made his reputation. On the death of Cabanel, his mantle seems to have descended on M. Jules Lefebvre, whose portrait of a lady in a velvet dress is most beautifully executed.

M. Jean Béraud has grouped, in a small circle, the most important portraits of the *Journal des Débats*, including a number of well-known political men and Academicians, Léon Say, Ardox, Jules Simon, John Lemoine, Renan, &c. In the portrait of Henri Rochefort by M. Van Beers, the artist has not forgotten a wrinkle in the worn face nor a lock of the rebellious hair; it is a facsimile which almost approaches caricature. M. Krug exhibits a fine portrait of J. Frey-Perrin on his death-bed; M. Hébert has sent a good portrait of General Miribel. Another good likeness is that of the sculptor Vitoux by M. Giacomotti. We may mention also the portraits of ladies exhibited by MM. Benjamin Constant, Cormon, and François Aumont.

We must conclude here a notice necessarily short in comparison with the amount of work exhibited, but in which we have endeavoured to give impartial in our selection. What strikes one most is the relative inferiority of the Salon in comparison with the "retrospective" collection at the Great Exhibition. The men of talent is, perhaps, about the same, but there is a want of remarkable works, above the average, and such as strike and compel the attention of the spectator. The collection as a whole is, with few exceptions, colourless and devoid of special features; and this general impression of mediocrity, which only the landscape section escapes, proves once more the injurious influence of official training, except in regard to mere primary instruction, on the artistic character and originality of the younger generation of painters.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS: THE ROMAN THERMÆ.

At the ordinary general meeting of this Institute, held on Monday evening last at 9, Abchurch-lane, Mr. Alfred Waterhouse, R.A. (President), in the chair,

Mr. W. H. White (Secretary) announced the decease of Mr. Edward Preston Willis, Associate, of Norwich.

Mr. White also read the nominations of a great many proposed new members, including thirty-four Associates, the President remarking that it was gratifying that all those gentlemen had passed the necessary qualifying examination.

Professor Aitchison, A.R.A., then read a paper on "The Roman Thermæ," of which the following is an abstract:

Illustrating, as their very ruins do, the size, splendour, and durability of Roman monuments, the author considers the Roman Thermæ to be subject of considerable interest to architects, and peculiarly so to Englishmen, as Richard, Lord Burlington, the architect, was the first who brought to light Palladio's drawings and restorations of them. Lord Burlington published engravings of these drawings in 1730, and since, other notable works have appeared, — Cameron's "Baths of the Romans" in 1772, with a second edition in 1775; O. B. Scamozzi published them in 1785, and the greater part were again published by Canina in his "Architettura Romana" in 1834. In 1828 Blouet published a monograph on the Baths of Caracalla; and during recent years Baron H. de Hymüller and Count Nispi-Landi had each published a monograph on Agrippa's Thermæ.

The author considers those of Agrippa to be the first Thermæ built at Rome. The Thermæ combined three main uses,—schools for teaching gymnastics, exercising-grounds, and baths. There was also a grand stand, to the race-course, an aqueduct to supply the water, and tanks to heat it, walks adorned with seats and statues, and halls for philosophers and others. The gymnasia and baths mostly formed a central block, separated by the grounds from the surrounding buildings, of which a considerable portion were, in some cases, shops or lodgings. Having dealt in detail with the various athletic exercises of the Romans, and the various officials and their duties, Professor Aitchison proceeded to describe a part of the Greek Gymnasium, in order to show how much of it the Romans retained. It consisted of two peristyles, with surrounding cloisters, and spacious halls beyond. The outer court was, in the Roman Thermæ, merely a part of the ground; but the first court, with its buildings, was doubled and kept in the central building, and usually had a single portico or cloister all round. At the back of that to the south was a hall called the Ephebeum; to the right of this was the Coryceum; next to it, the Conisterium, or dressing-room; and beyond this the cold bath. To the left of the Ephebeum was the oil-store and anointing-place; next to this the Frigidarium, and thence was a passage to the Propægium, or furnace. In the turn of the portico was the vaulted sweating-chamber, with the Laconicum at one end, fronting which was the hot bath. In the time of the Empire women participated in the exercises, although whether privately or in company with the men was not now known. Vitruvius's information about the hot bath was almost nothing; but Pliny the younger, Seneca, and Lucian somewhat supplied the want; and, having quoted from Pliny's description of the baths at his Laurentine and Tuscan villas, the author proceeded to describe various sorts of bathing and the habits of bathers, giving a list of the bath-servants. He then dealt with the Thermæ in order of time, taking first those of Agrippa, built about 27 B.C. On either side was a peristyle, and fronting each an oblong hall, with semicircular ends, communicating at one end with a single room, and at the other with three. The oblong hall was evidently the front entrance to the Gymnasium; the one room, perhaps, the porter's lodge, and the three undressing-rooms. At the other end of the peristyle were two rooms,—possibly the Elæosthesium and Conisterium, or the attendants' rooms; and next there was a doorway into the end portico of the Piscina. The Tepidarium, into which were two entrances, could not be mistaken for any other room. It had four enormous piers to abut the vault, and two recesses for the floor-baths at each end; the middle bay formed shallow transepts going up to the screens of columns to the Piscina. The same arrangement was found in all the Thermæ, from Agrippa's to Constantine's, and at Caracalla's some of the floor-baths still existed. The hemicycles at each end might have been cooling-rooms, and in the centre of the upper one was an entrance into an oblong court which led into an enormous hall, while beyond the apse was the Pantheon. If the Pantheon had not been originally built for the Laconicum, what had it been built for? Not for an entrance-vestibule, as it led into the hottest room. It had a likeness to the Laconicum of Caracalla's, and even to that of Constantine's, Thermæ. The author believed the four rooms on either side of the back front, which were entered from the grounds but communicated with one another, to have been the baths which originally belonged to the Gymnasium. The next Thermæ were those of Nero, 64 to 68 A.D. The chief alterations from Agrippa's were that the two swimming-baths were made into one in the front, the Ephebeum was converted into a large apse, the Tepidarium was increased in length by a vast vaulted hall at each end, and there were some small chambers, possibly for sea-water and sulphur baths. There was, however, no circular Laconicum. The Thermæ of Titus, 78-81 A.D., resembled Nero's very closely, and the chief peculiarities were the two long arcades going from the wall of the Ephebeum to within about 33 ft. of the enclosure of the grounds, and a square building in front of each Gymnasium, containing a circular chamber nearly 82 ft. in diameter, which Professor Middleton believed to be Laconica. Another bath, called by Palladio the Thermæ of Vespasian, 69 to 79 A.D.; by

Cameron, Domitian's, 81 to 96 A.D.; and by other writers, Trajan's, 98 to 117 A.D., was supposed by Professor Middleton to have been for women only. Next came those of Caracalla, 211 to 217 A.D., described by Elius Spartianus as the "exquisite baths of Caracalla." The solar cell was a marvel in that writer's day, but which was the solar cell was only settled by Professor Lanciani in 1873. It was the swimming-bath (Piscina), the flat roof of which was carried by T-iron girders. The carrying a flat terrace 180 ft. long, with a span of 76 ft., probably 2 ft. deep, would not, the author considered, be so very easy to construct even in the present iron age. Although the plan was pretty, that of Agrippa bore the palm, the two giant apses in which, looking down the Tepidarium instead of into the Gymnasium, producing a more splendid effect. In the plan of Caracalla's, every feature of Agrippa's was recognisable, and, having described them in detail, the author dealt in like manner with the Thermæ of Diocletian, which were the largest erected in Rome. The site of the grand stand was now the Piazza dei Termini, in which the Via Nazionale terminated; so those who had seen Rome lately could judge of its vastness. The central building bore a close resemblance to the other Thermæ, except that in the gymnasia the peristyles went completely round. The last Thermæ given by Palladio were those of Constantine, 306 to 337 A.D., the Tepidarium of which bore a close resemblance to Nero's. The circular Laconicum, similar to those of Agrippa and Caracalla, again made its appearance, but the old form of Gymnasium had disappeared. With the exception of Nero's Golden House, no buildings were so splendidly finished as the Thermæ. Agrippa's alone were without that most gorgeous of all decorations, glass mosaic, as it was not then invented, its place being supplied by encaustic painting. In subsequent Thermæ the walls were lined with coloured and polished marbles, and the vaults with glass mosaic. The larger columns in the Thermæ were mostly of granite, while those of secondary size were of red porphyry, of cipollino, pavonazzetto, giallo antico, and other marbles. Buildings more sumptuously finished could scarcely be imagined, while they were adorned, too, with the masterpieces of Greek sculptors.

Mr. Arthur Cates, in opening the discussion, said it was in no formal manner that he rose to move a vote of thanks to Professor Aitchison for the delightful discourse he had favoured them with that evening. It took him back many years,—to days now long past,—when Dr. Burgess, Mr. Ashpitel, and other members of the Institute, read papers illustrating the architecture and customs of ancient Rome. It was a great satisfaction to all of them that they had now some indication of a revival of these most agreeable and instructive evenings, and he hoped they might consider that the paper they had just heard, which had dealt generally with the plans of, and with the customs connected with, the baths, was simply a precursor of a series of annual or more frequent discourses they would receive from Prof. Aitchison. The discourses with which Dr. Burgess favoured the members annually for many years took them over a series of great interest. Since that time there had been considerable discoveries, which had extended their knowledge, and many of those who heard Dr. Burgess and Mr. Ashpitel had passed away; so that there was room for a fresh series, which the Professor had so well inaugurated that evening. The subject was one which possessed much interest, and required considerable and close study to appreciate the differences that had arisen between antiquarians as to the appropriation of parts of those baths. He was somewhat surprised to find Professor Aitchison upholding the assumption that the Pantheon was part of the Baths of Agrippa. The theory of some of the architects of the last century, that the Pantheon was a vestibule to the Baths of Agrippa, always appeared to him entirely untenable, and he did not feel inclined to give more support to the theory Prof. Aitchison had put forward, viz., that it was intended for a laconicum. If it had been intended as part of the baths, no doubt when the magnificent apartment was cleared from the scaffolding, and appeared in all its grand and striking glory, it must have seemed too splendid even for a magnificent Roman bath. But he could not think from its position on the plan, and from its other arrangements,



that it had ever formed a portion of the bath. On looking at the plan they would see that the athletes probably used the spaces on either side of the Pantheon as places of exercise, and there must have been some arrangement of porticos or colonnades which would have given the plan a different appearance to that which it occupied at present. He therefore hoped that Professor Aitchison would not bind himself to the theory that the Pantheon had been the laconicum of the Baths of Agrippa, but would further consider the subject, and perhaps find from some authority on the matter some indication of the structures which occupied the space on either side of the building. The general description given by Professor Aitchison applied very well to what was known to us as the Turkish bath, and it was to be regretted that in our great cities we had not such baths on a larger scale than those which private enterprise had yet been able to found. The municipalities had established what they called "baths and wash-houses," but those institutions did not contribute to more than a superficial removal of dirt. If, however, the municipalities were more enlightened, and could appreciate the value of the hot-air bath, they might erect such baths, constructed on the same principle as the Roman baths, which would be really of service for the cleansing of the epidemics of the people. Unfortunately, in these busy days, a bath of that description occupied too much time, and also required the exercise of considerable discipline on the part of those who used it. It was therefore quite possible that both the consumption of time and the necessary submission to severe discipline might render a bath of that kind not agreeable to the classes to whom it would be most beneficial. At the same time, the people might be educated up to it, and there was no doubt those great baths of Rome were simply the developments of smaller establishments in general use long before the time of the Emperor Titus or Caracalla. Thus from small commencesments we might hope that the excellent Roman bath would be established amongst us again as it once existed when England was an appanage of the Roman Empire. Throughout England Roman baths of some magnitude were to be found, as, for instance, the one in the city of Bath, which had been happily preserved, and which, comparing Rome with Britain, was equal in proportion to the great works of the Eternal City (applause). He would commend to those who were interested in the subject the study of the Roman bath at Bath, the beautiful model of which, exhibited at the Health Exhibition at South Kensington three or four years ago, attracted considerable attention. Mr. Cates expressed his thanks to Professor Aitchison for the pleasure he had given by his admirable paper, and by the manner in which he had dealt with the design and construction of those great buildings. Under his hands they would no doubt have much information respecting the design and the proportions of those vast halls, which even in their ruins were so admirable and stupendous in effect. And from what he had heard of the Professor's lectures at the Royal Academy,\* there was no doubt he would be able to give them on a future occasion an admirable discourse, which would be even more interesting and valuable than the paper he had just read (applause).

Mr. A. S. Murray said it was always a great pleasure for him to be present at a meeting of the Institute, but it had been specially pleasant and instructive that evening, as was to be expected from such a subject in the hands of their kindest of friends, Professor Aitchison. On the way there he had been thinking of the subject of Roman baths, and became very much astonished at the depth of his own ignorance about them; but after listening to the lecture, bristling as it did with learned research and ingenuity, he had come to the conclusion that his ignorance was not so much to be ashamed of. At all events, he had learned much that evening, and would be able to carry away a great deal, so that in future he need not be so frightened as he had been at the Museum when people came to him with questions about the Roman baths. In the name of Classical archaeologists, he might venture to offer their thanks to Professor Aitchison for having worked at that puzzling and difficult subject, and brought his materials in such a concentrated form altogether for their benefit.

\* These lectures, we may say, have been fully reported and largely illustrated in the current volume of the *Builder*.—Ed.

He begged, therefore, heartily to second the vote of thanks (applause).

Mr. Alexander Payne asked Prof. Aitchison if researches had been made to discover how those large baths were warmed? He remembered noticing in the baths at Pompeii that there were not only hypocausts under the vaults, but also hot air was used as a means of warming. He would like to ask the Professor if the same arrangement was used in Rome, or was hot air forced into the rooms in any way? Mr. Cole inquired whether there was now the slightest trace remaining of the entrance to the Pantheon from the building in the rear? One knew that a bricked-up doorway kept its appearance through ages, and it was likely that if the Pantheon was used as a laconicum to the Baths of Agrippa there would be some faint trace of its connexion with the other portion of the baths. Mr. Cates had suggested that Professor Aitchison should favour them with some future paper, giving information as to the construction and details of the baths. But there was one point in which he felt very much interested in the Professor's recent lectures at the Royal Academy, and that was the mention of the recent discovery of an iron roof of considerable size. If the Professor would give some idea of that, it would be interesting, as they had all along fancied they were the first people of these later days who knew anything of iron roofing, and to hear of such a thing being used on a large scale in Roman times was news to some of them.

The Reverend C. L. Acland (Colchester) said that there were one or two words he would like to say. The only excuse he could give for himself was that he had charge of one of the most important collections of Roman antiquities in Britain, and that he was thoroughly conversant with the antiquities of the old Roman town of Colchester. There was no doubt that these baths served very much the same purposes as were now served by our modern clubs. They were not only bathing-places and gymnasia, but great meeting and assembly places, which corresponded very nearly to the clubs of the present day. In fact, a vast amount of what might be called "underground politics" and work of various kinds was transacted there which could only have a very indirect connexion, if it had any connexion at all, with the ostensible purpose of the buildings themselves. And when they found, age after age, more and more magnificent buildings raised up in Rome for those purposes, it was as well not to lose sight of the political aspect of them. The Roman *thermae* at Bath had been mentioned. At Colchester, although it was a Roman town for a long period, he did not think there were any remains of baths to be found, although there must have been *thermae* there. With regard to the athletic training which took place at the baths, it also had to be borne in mind that there was this great difference, that the Greeks seemed to have done their athletics for themselves, as young Englishmen did, while the Romans preferred to have their athletics done for them. At all events, in the later days of the Roman Empire they found professionals occupying a position which had clearly no parallel in Greek training. He had no doubt that the Greek athletics were familiar to all those present, and if they could bring forward any of the Greek athletes nowadays, they would in all probability "break records" at a great pace, and it would be found that they would compare more than favourably with the greatest athletes of the present day. Their athletic training was to a great extent the cause of the extreme beauty of the human form, which certainly reached a pitch amongst the Greeks it never acquired anywhere else so far as we knew, and there was also a training of the eye and a skill in sculpture which gave such models of perfection of the human form as probably were never brought into existence elsewhere. To the Greek training schools, therefore, was due the greatest perfection of the human form (applause).

The President remarked that Professor Aitchison had mentioned that the Roman baths had been the means of securing to posterity the finest dome in existence, and also the widest vault; and he was curious to know what that vault was, and its width. There was no doubt that they must have been enormously wide, as could be seen from the vaulting in the Baths of Agrippa, which was 68 ft. wide. The Professor had spoken about the Baths of Titus and of a chamber paved with *lapia lazuli*, and then he seemed to throw some doubt upon the subject. He was much interested in the Pro-

fessor's reverting to the general appearance of St. Mark's, because he supposed St. Mark's gave them one of the best ideas of the general internal finishing of a large Roman bath that could be found nowadays, both as to its mosaics and its marbles on the walls and floors. He entirely sympathised with the expressed hope of Mr. Cates that such papers as they had heard that evening might lead them to think more about the advisability of large baths being erected for the use of the public than had been hitherto built. It seemed a disgrace to the civilisation of the present day that people should be content with the very mean buildings now erected for that purpose (applause). The members were also very much indebted to Mr. Acland for his remarks on the use of the baths. It seemed impossible to suppose that such enormous buildings should have been reserved only for bathing purposes; but when, as Mr. Acland had explained, they seemed to have been used very much as clubs, and especially as political clubs, one could understand their size and magnificence.

The vote of thanks was then put and carried by acclamation.

Professor Aitchison, in replying, said that in bringing forward the subject, it appeared to him that it would be an interesting one to a body of architects. There were many things to be found out and learned from those baths of the Romans,—indeed, many more than he had hinted at. He himself had had conceit enough when he took up the subject,—knowing that he was an old Turkish bather, knowing something about athletics, brought up as an architect, and having some slight remnant of the classical lore of the schools still hanging about him,—to think he was going to throw a light upon the subject which had never been shed upon it before; but in that he was disappointed, finding that he had ended in very much the same state of ignorance as that in which he began. He had, therefore, brought the matter before the Institute in the hope that amongst all its learned and skilled members there might be some who would be induced to study the subject. Indeed, he had the conviction that if a great number of intelligent people were interested in the matter, and would devote some of their spare time to it, they would at last get to know more about it than had ever been known since the time when the baths were erected. That it was not altogether a useless subject for the consideration of architects was evident from the fact that the Romans were the most practical people that the world had ever seen, as well as the greatest organisers, and they might be quite sure that whatever was done by the Romans was done with the most precise business knowledge. The architects of the present day could not do better if some of their spare time than ask themselves why and how these things were done. The subject was so large that he had been unable to treat it on all sides. Mr. Cates was kind enough to speak of him in very flattering terms, and to ask a great many questions, which he was sorry to say, he was not in a position to answer. The Baths of Agrippa,—which must have been built when Vitruvius was an elderly man,—were exactly opposite in position to what he recommended. That is to say, that the rooms should be at the south, while here they were at the north. The reason for this could only be settled by knowing what the peculiarities of the site were when they were built. Lucian, in speaking of his friend the architect Hippias, who had built some baths, stated that he very properly kept the cold rooms at the north and the hot bathing-places at the south. The question of the Pantheon was a very burning one. Professor Middleton said he was there when some of the pavement was taken up. There was then no hanging floor, no vertical flue-pipes, yet the lecturer was confident he had read somewhere that in some of the alterations to the chapels of the Pantheon vertical flue-pipes were found. He had written to Mr. Sillman on the subject, but that gentleman said he knew nothing about it, but his impression was the same. He had written to another friend in Rome, from whom he had not yet an answer. Professor Middleton, however, told him there was nothing found in the shape of furnaces, nor hollow found in the flue-pipes,—nothing but the drain that took the water off that came through the eye. In comparing the Pantheon with the Laconicum of Caracalla's Baths, and also with that of Constantine's Baths, it would be seen that the circular plan was repeated, showing that there



was a tradition of a circular building being used for the laconicum, not to speak of Vitruvius's directions. There was no doubt about the use of the Laconicum in Caracalla's Baths, and its having been lined with five pipes. Any one who saw the Pantheon would at once imagine that it had been built for a laconicum, but beyond that he was afraid he had nothing more in the shape of argument to offer. Mr. Payne had asked about the hypocausts and pipes, but the only baths now remaining at Rome which could throw much light upon the subject were the Baths of Caracalla. The Baths of Diocletian had been turned into the Church of Santa Maria degli Angeli, while it had been impossible lately to get admission to the Baths of Titus, so that he had no opportunity of examining them. But Professor Middleton declared the two circular buildings had hypocausts and vertical flue-pipes. In Caracalla's Baths were to be seen now the remains of the flue-pipes, &c., with the piers, as Vitruvius had described them, supporting the floor, and the mortar of clay mixed with hair. There were flue-pipes going round the building, so that there could be no doubt about its use, and these flue-pipes had also been found in the Roman baths discovered in the City of Bath. Mr. Cole had asked a question about the Baths of Caracalla, but the lecturer found that his paper was such a long one that it would tire the patience of his audience, and he had therefore cut out a good deal of it which dealt with that part of the subject. *Ælius Spartianus*, in speaking of the Baths of Caracalla, said there was a solar cell, which was built with latticed beams of bronze, which carried the roof in such an extraordinary way that persons in those days declared it was then impossible to do anything like it. This solar cell was at one time supposed to be the laconicum, but when this was cleared out, some masses of concrete, which formed part of the dome, were found on the floor, and it was thus conclusively shown that it could not have been the laconicum. Lord Savile, our then Ambassador at Rome, took the trouble, although the Professor was a perfect stranger to him, of asking Professor Lanciani to give him any information he had on the subject. Professor Lanciani told him that when the piscina was excavated, an immense quantity of pieces of wrought T-iron were found, and also bars of iron with T-ends embedded in the concrete. The thickness of the floor and roof did not appear to be above 2 ft. or 2 ft. 6 in. at most. No doubt, when the barbarians invaded Rome, the "looted" the bronze, while they left the old iron. It was by means of these T-iron riders that the roof was carried. He did not fancy it was all built over, but that there was a space all round, solidly covered with concrete, with the rest either open or covered with skylights, and the iron embedded in the concrete was for the purpose of carrying it from girder to girder. It would not be a bad subject, he thought, for the competition for the Grissell Prize to show how a flat ceiling, with a span of 76 ft., could be made, with an ambulatory of concrete and mosaic, and with a centre skylight. What he had said only showed that we at the present day, who consider ourselves masters of iron construction, were, perhaps, not so much in advance of the Romans. In answer to the Rev. Mr. Acland, there was no doubt the Roman *Thermae* were greatly used for a variety of purposes, but he did not know that they could be termed "clubs," which hardly conveyed the idea of the number of people assembled. They were, in fact, combinations of all sorts of things—public gardens, picture and sculpture-galleries, conversation and lecture-halls, for discussion, for music possibly, as well as baths and exercising grounds. Doubtless, too, the Roman Emperors felt very much with the enlightened governments of the present day, that it was far better to have their doings canvassed in public places than in private clubs, and, therefore, they rather encouraged political discussion in the Baths. In free countries the Governments found the newspapers most useful, and there was little doubt that so astute a person as Augustus Caesar was not blind to the advantages to be gained from open discussion. A great many people must have passed most of their time in the Baths, and many lived there. Mr. Acland had referred to the training of the Greeks. The speaker had not enlarged upon that subject, or else he might have been them with an entirely new lecture. The Greeks were the first people who ever made painting

and sculpture, in the proper sense of the word, possible. They saw what was to be gained by training the body to hardness and beauty, which also invigorated the mind, thus becoming the most intellectual people the world had ever seen. The Greeks, loving the beautiful, and wishing to immortalise those things which they considered of vital importance, had opportunities which no other people ever possessed. Anyone at the present day who had a love for sculpture could only study it by having models, but in the old Greek times any one who had a taste for it, and who thought it was doubtful whether a certain muscle in a statue showed in a certain direction, had only to go and see the athletes training. The Romans carried on their athletic training in a much less degree, and at last it became confined to professional athletes. In answer to the President, he might say that the *tepidarium* of Caracalla's Baths was nearly 80 ft. wide. The nave of St. Peter's was said to be from 82 ft. to 86 ft., but he believed the 142 ft. 6 in. the diameter of the Pantheon was the greatest dome built of materials exclusive of iron that existed in the world. As to the paving of *lapis lazuli*, Corsi, in his description, said that in the time of Innocent X. one of the halls of the Baths of Titus was found to be paved with *lapis lazuli*, but he did not say which chamber it was. He hoped that those who were interested in the subject would look into it and endeavour to throw as much light upon it as possible. The reading of some of the classical authors, and especially the less known semi-classical ones, might throw some light upon the matter, and if a large number of persons would only turn their attention to it, great advantage could not fail to accrue. Anyone, too, who would take the trouble of examining the Baths, would find there was a great deal to be learnt which could be usefully applied in the present day (applause).

The President then announced that the next meeting would be held on June 3. The meeting would be a business one, for the election of the Council and the Standing Committees for the ensuing year, after which a paper would be read, the title of which would be announced in the "Journal of Proceedings."

The meeting then separated.

#### THE ARCHITECTURAL ASSOCIATION.

THE last ordinary meeting of this Association for the present session was held on the 17th inst., in the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

The following new members were elected, viz., Messrs. T. Honor and W. W. Powell.

The rules relating thereto having been submitted and read, the affiliation of the Glasgow Association was unanimously agreed to.

It was announced, amid applause, that the Travelling Studentship had been awarded to Mr. A. E. Bartlett, and the second prize to Mr. Percy D. Smith; Messrs. Sydney K. Green-slade and Ernest E. Fetch being bracketed equal for honourable mention. It was also announced that the Cates Prize had been awarded to Mr. Banister F. Fletcher.

The President announced that the late Mr. C. R. Pink, Past-President, had bequeathed the whole of his architectural books to the Association.

The first vacation visit, it was announced, would take place on June 1, to the new buildings at Eton (Mr. Blomfield's), and the old buildings will also be shown. The second visit would be to Farham, Sussex, on June 15.

Mr. D. J. Blow then read a paper entitled "A Travelling Students' Notes," which, together with some notes of the discussion which followed, we print in subsequent columns.

Mr. W. W. Burrell afterwards moved a vote of thanks to Mr. Appleton for his services as President during the past session. He said Mr. Appleton had given them both his time and attention, and had always worked in the interests of the Association during the session as well as in the vacation, and he deserved their hearty thanks (loud applause). He was glad to see that the members appreciated the services of a man like Mr. Appleton. It seemed unnecessary to say more, their feelings seemed to be heartily in accord (renewed applause).

Mr. A. B. Pite, in seconding the motion, said that the former services of Mr. Appleton as Hon. Secretary to the Association induced them to form the highest possible hopes of his occupancy

of the chair, and he (Mr. Pite) ventured to say, on behalf of his fellow members, that Mr. Appleton had more than fulfilled their highest expectations (applause).

Mr. A. O. Collier said he rose with very much pleasure to support the resolution. He could speak from a different standpoint than Mr. Burrell, for the reason that he had had practically nothing to do with Mr. Appleton in the working of the Association, beyond acting on one committee. They all thoroughly knew and appreciated the real energy which Mr. Appleton showed in everything he took up, and the extraordinary amount of attention he gave to the affairs of the Association (applause).

The resolution was passed by acclamation.

The President said he retired from his present position with the very greatest pleasure (laughter), to seek the obscurity which so well suited him. He had only two feelings, and one was that he left his exalted sphere with heaps of friends and not a single enemy (applause).

The President again rose and said he wished to propose a vote of thanks to Mr. J. Douglass Mathews, who retired this year from the Treasurership of the Association, after the long service of twenty-five years. During that time Mr. Mathews had most faithfully fulfilled the duties of his office, which was not altogether an easy task. He was sure he would have the support of everyone present in proposing this vote of thanks (prolonged applause).

Mr. H. W. Pratt said he should like to be permitted to second this vote of thanks. As Assistant-Treasurer, he had been brought into intimate contact with Mr. Mathews during the last few years, and he could speak with knowledge as to the conscientious way in which Mr. Mathews had undertaken and carried out the work of the Treasurership. It was a most unprecedented thing in the Association that a man should serve in an office anything like twenty-five years. He was sorry that Mr. Mathews was not present, because he could have told them better than anybody else how the Association had grown, and what work it had done during those twenty-five years. At the present time they had an income of something like 1,000*l.* He supposed twenty-five years ago it was not a third of that amount, and, of course, the work now was considerably greater. Nevertheless, Mr. Mathews had kept at his post all through these years, and had served the Association in a way which they had really no idea of, unless they had had the pleasure of auditing the accounts, which would give them an insight into a little of the work. He was sure they would very cordially carry this vote of thanks to Mr. Mathews for so thoroughly well and conscientiously serving the Association during that very long term of years (applause).

The resolution was cordially agreed to.

Mr. H. O. Cresswell said there was one very excellent functionary to whom he wished to propose a vote of thanks,—a very energetic, hard-working member of the Committee. He referred to Mr. Pryce (applause). He thought no one who had not worked on the Committee, or been intimately associated with the sub-committees for any time, had any idea what the work of the Secretary of the Association was. There were two secretaries, but the work of the senior secretary was extremely heavy, and if he did not have a junior secretary who gave him loyal assistance it would be impossible to carry on the work. He thought Mr. Pryce had had that in Mr. Farrow (applause). Mr. Pryce was retiring from the Secretaryship; but he congratulated them that they would not lose his services, because he was to occupy the honourable position of one of the Vice-Presidents. Mr. Pryce had worked for them morning, noon, and night, and he thought he was entitled to their warmest thanks (loud applause).

Mr. Banister F. Fletcher expressed pleasure in seconding the resolution, which was carried with enthusiasm.

Mr. T. E. Pryce acknowledged the compliment, stating that he was sorry to some extent that his Secretaryship had ended, but he could now look back upon it with a vast amount of pleasure (applause).

It was not until a quarter to eleven that the scrutineers (Messrs. Parks, Wimpey, Webb, and Earl) reported that the following officers had been elected for Session 1889-90, viz. :—

*President*.—Mr. Leonard Stokes.

*Vice-Presidents*.—Messrs. W. Burrell and T. E. Pryce.

*Committee*.—Messrs. H. D. Appleton, F. T. Baggallay, W. H. A. Berry, A. C. Bulmer Booth,



H. O. Cresswell, O. Fleming, G. R. Julian, P. J. Marvin, A. B. Mitchell, and J. Slater, B.A.  
*Hon. Treasurer.*—Mr. Hampden W. Pratt.  
*Hon. Assistant-Treasurer.*—Mr. R. L. Cox.  
*Hon. Librarian.*—Mr. W. H. Town.  
*Hon. Assistant-Librarians.*—Messrs. J. W. Stonhold and H. M. Stonier.  
*Hon. Secretaries.*—Messrs. F. R. Farrow and E. S. Gale.  
*Hon. Auditors.*—Messrs. A. E. Northcote and Max Clarke.

The announcement that Mr. Stokes had been elected as President was received with loud and long-continued cheering, and after a vote of thanks to the scrutineers, the meeting broke up.

### Illustrations.

#### "HATCHLANDS," SURREY.

**THIS** effective and picturesque drawing appears to represent additions to an ordinary Georgian house, in the way of a colonnaded cloister, a formal garden and a balustrade fence walk. It makes a good picture, and the trees (as usual) assort well with the Classic details; but as, owing to accidental circumstances, the architect (Mr. Halsey Ricardo) has been prevented from communicating to us, in time for publication, any further particulars, we must for the present leave it simply as a picture.

#### ZARA, DALMATIA.

THE Cathedral of Zara in Dalmatia, as described by Constantine Porphyrogenitus in the tenth century, appears to have been a basilica of Byzantine architecture resembling that of Parenzo in Istria, or those of Ravenna. Of this church, however, very few traces remain. Whether it was ruined at the storming of Zara in 1202 by the French and Venetians of the fourth crusade, or whether it survived that catastrophe, is uncertain; the accounts of the several historians differ. But however this may have been, it is certain that the rebuilding of the duomo was undertaken early in the thirteenth century by Archbishop Lorenzo Perandrio, a native of Zara; the money, according to one account, being found by the penitent Crusaders, though this is very doubtful.

Though the church was not consecrated till 1285, and the west front was not built till 1324, and not wholly finished till a century later, the whole building is in the Romanesque style, which in Dalmatia lived on through the whole period during which in the rest of Europe it had yielded to Gothic, and actually survived till it met and gave way to the new round-arched style of the Classic Renaissance. The west front, with its tier above tier of round-arched arcading, and the similar arcading of the north wall, part of which is shown in the illustration, recall the Romanesque churches of Pisa, Lucca, and Pavia, and might easily be mistaken for work of the eleventh or twelfth century.

The campanile stands detached from the duomo, and though it was not begun till 1480, it is still in good Romanesque. It is the work of Archbishop Matteo Valaresso, whose magnificent pastoral staff—a unique specimen of silversmith's work—is preserved in the treasury of the Cathedral. His campanile was evidently intended to be a magnificent work, for the lowest stage, which is about 27 feet square, and rises to the height of 30 feet above the ground, is composed of solid masonry, with the exception of a small beehive-shaped chamber in the centre of this enormous mass of material. The campanile which this astounding substructure was intended to carry was evidently to be of unusual size and height, but the Archbishop's magnificent project was checked by the interference of his relatives, who did not desire that his patrimony should be exhausted in this way, and perhaps also by the jealousy of the Venetian Government. His tower, therefore, stopped short with its second stage, and the five bells of the Cathedral now hang at that modest elevation under a temporary roof. Funds are being collected, however, for completing the campanile on a scale worthy of the interesting duomo to which it belongs, and of the dignity of Zara, as the capital of Dalmatia.

The design has been entrusted to Mr. T. G. Jackson, whose drawing of it, reproduced in our illustration, is hung this year at the Royal Academy. The existing tower is to be surmounted by two more square stages, in the uppermost of which the bells will be re-hung. Above them the campanile finishes with an octagonal lantern between four detached

pinnacles, surmounted by a short spire. The whole is designed in the Romanesque style of the lower portion, a style which can hardly be said ever to have expired in Dalmatia, for the campaniles which were built there, even in the sixteenth and seventeenth centuries, partook as much of the character of Romanesque architecture as of the neo-Classic of the period.

#### THE CHURCH OF ST. LUKE, RICHMOND.

THIS church, of which we give interior and exterior views, has just been consecrated by the Bishop of Rochester. The plan given will explain the arrangement. There is a heating chamber under the vestries. Outside, the walling is of Casterton stone, with Ancaster and Bath stone dressings, and the roofing is of red tiles, with overhanging eaves to the nave. Inside, the columns and responds, with bases and caps, the arches, strings, and all external angles, are of stone. The mouldings are elaborate, but there is little carving, and that in the chancel. There is a brick dado round the walls; the general flooring is of wood blocks, with black and white marble paving in the chancel. The nave roof is of open timber, with curved ribs; that of the chancel is wood-groining. There is an arcade of stone at the east end. The screens round the chancel, and the stalls, will be oak; the general seating of that material is now fixed. The work was carried out by Mr. Dorey, of Brentford, and Mr. J. Watson acted as clerk of works. The architects are Messrs. Goldie, Child, & Goldie.

#### A TRAVELLING STUDENT'S NOTES.\*

MR. PRESIDENT AND GENTLEMEN,—I must first apologise to you for not having prepared in a better manner my notes for this evening. Owing to the happiest and most delightful circumstances, I was obliged to leave last June the then but shortly commenced pleasures of this studentship, and was not able to recommence that same work at Beauvais Cathedral until last March. No doubt some of you, or may it be many of you, are well acquainted with, and have been allowed to study, this glorious example; and those who have that pleasure to come will have heard of, or may have even in passing through the town on one of those delightful preliminary tours of sight-seeing before deciding at which place to settle down for serious work,—gazed up with wonder and astonishment at this choir of choirs,—spun like a cob-web in the air,—so that you will understand the difficulties, or rather impossibilities, of doing justice to so grand an edifice, either by drawing or description, in so short a period. Still, with vain and foolish calculations, I had hoped to finish a part of the apse by now, but practice soon showed me the absurdity of my speculation, so that I have broken the thread of my work for a few days, to show and tell you the little that I as yet know of Beauvais, and that I may return with the information that you can give me on the subject, wiser than I came.

About 991, Hervé, fortieth Bishop of Beauvais, laid the foundation of a cathedral dedicated to St. Pierre, which his successor, Roger de Champagne, continued. But in 1180 this edifice became the prey of the flames.

In 1225, Bishop Milon de Nanteuil, with the aid of the chapter, undertook the building of the present cathedral. The apse and choir, properly speaking, were commenced in 1247, and were completed October 31, 1272. It is thought that Eudes de Montreuil, architect to St. Louis, designed the choir. But alas! this choir was built with insufficient funds, and with indifferent material, both as to quality and size, and on November 29, 1284,—but twelve years after its completion,—a large part of the vault fell in, causing so much damage that for forty years no offices were held in the cathedral. In 1337, Bishop Jean de Mavigny and his chapter desired to finish the choir, and chose as architect Enguerand le Riche, and it was then found necessary to subdivide the large bays on either side of the choir (the total length of which measures 84 ft. from the centre of the first pier to the centre of the fourth) by placing intermediate piers, and the apices of the semi-arches carried by these piers were blended into the then existing arch; the intermediate pier was carried up, dividing the original width of clearstory and triforium into two parts, and

supported a new vaulting-rib, thus converting the quadripartite vaulting into hexapartite; it like manner, the vaulting of two of the bays on the north side and two of the bays on the south side of the choir-aisle was converted to hexapartite, the extra rib on the outside being carried by an intermediate pier, subdividing the corresponding large bay of the side aisle arcade. After this was done the work at the cathedral was stopped for over a century by various wars, and was not resumed until the 21st of May, the year 1500, when Bishop Villiers de Isle Adam laid the foundations to the transept on the northern façade of which, being partly constructed at the expense of François I., was completed in 1537, and was executed from the designs of Martin Cambiche de Paris. The southern transept was executed from designs of the architect Michel Lalge, and was completed in 1548. But now, instead of continuing the nave, one bay of which had been started, the architect, Jean Vast, who succeeded Lalge, constructed on the piers of the crossing a gigantic flèche, 303 ft. above the apex of the vaulting, or 462 ft. above the transept-floor (this does not include the height of the cross at the apex of the flèche). It was pierced, forming a lantern, two-thirds of its height, but the pier receiving no support from the nave, gave way, and this great spire fell but five years after its completion, on the 30th of April, 1573, seven in the morning, on Ascension Day, just as the procession had left the Cathedral for the town, and this new disaster was not entirely repaired until 1576.

Thus we see Beauvais met with much misfortune. And now the apse, with its chapel and the north and south side chapels to the choir, the columns to the three large bays the choir, and the eastern aisles to the transept form very nearly the entire remnants of the original structure. Let us first consider in the design of this cathedral the harmonious relations between the whole and its parts.

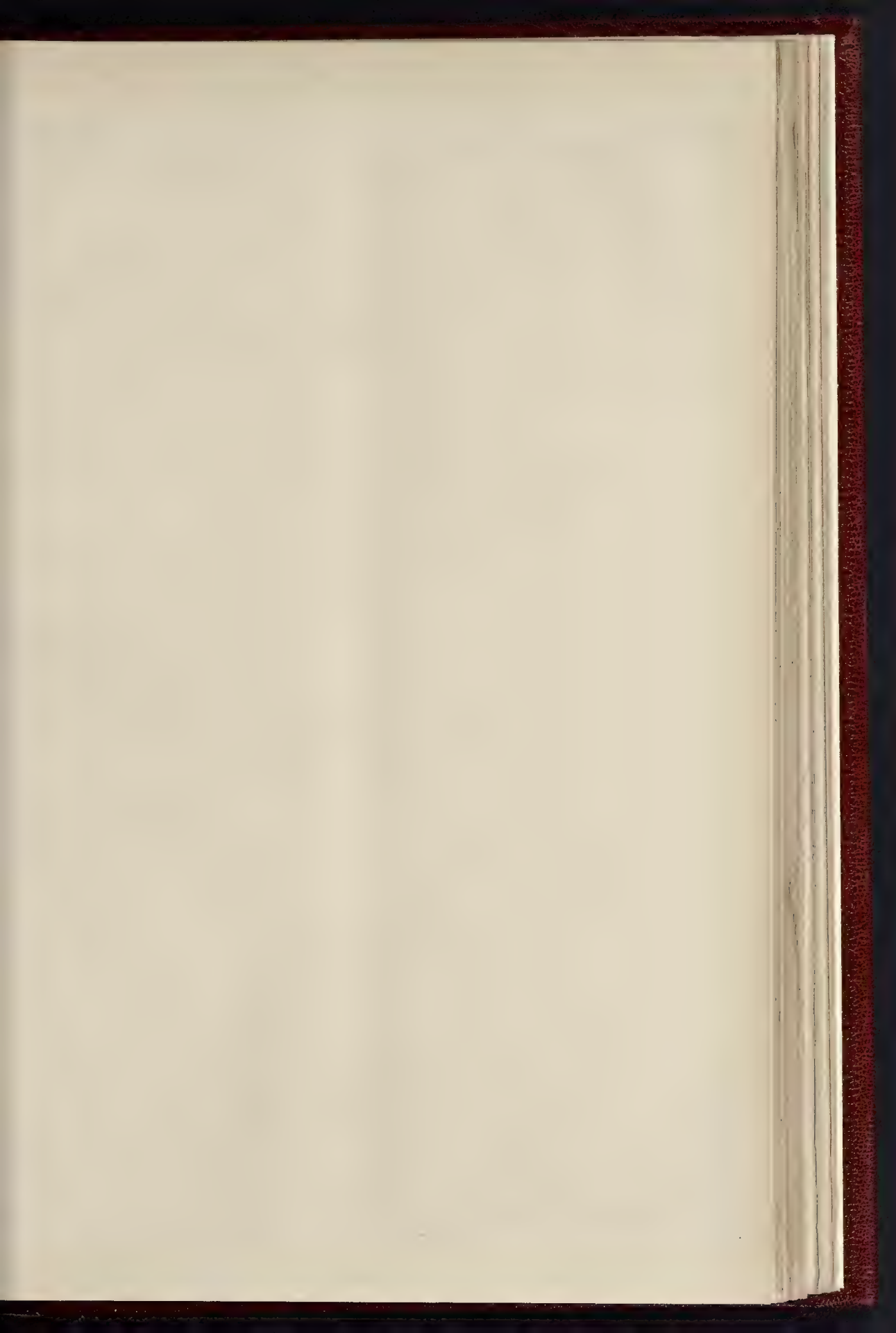
Here is a plan of the choir at Beauvais, the axis being at A. First of all the axes of the principal pillars which support the principal nave were fixed at 50 ft. distance from each other. At a point *a* taken in one of these axes a line *a b* was drawn at an angle of 60 deg. giving at its intersection with the other axis the point *b*, the centre of a pillar like the point *a*. Drawing from the point *b* a line perpendicular to the axis, we obtain a point of intersection *c*, the centre of a third pillar. In this section the centres of the pillars have been arrived at. Still proceeding in the same way, a series of equilateral triangles is obtained, whose apexes give the line C of the intermediate pillars of the double aisle, and the exterior plain D of the side of the lower aisle. The diameters of the cores of the pillars of the central nave were fixed at 4 ft. 7 in., those of the intermediate pillars at 4 ft. 7 in. also, the thickness of the wall D at 5 ft. 3 in. Thus we have arrived at the axes of the distance between the pillars, and the width of the aisle, and we see that the distance between three of the pillars of the choir is equal, but also that these distances extend more than half the span of the choir; for the axes of the pillars *a* and *c* are distant more than half the direct distance between the axes *c* and *b*, whilst the pillars *a* and *b*, are distant from each other only half of the diagonal *a b*. There is thus a relation and dissimilarity, and this, as M. Viollet-le-Duc says, is one of the conditions of harmony from an architectural point of view, to avoid the apparent succession of equal divisions, but at the same time to have proper relations existing between them. In the same way, distance between *a* and *d* is less than the distance *a c*, but this distance is equal to half the distance between axes *a c*. The space *a c* is smaller than the space *a d*, so that in a longitudinal direction the bays are similar; in lateral they are dissimilar, and decrease towards the sides, which is, moreover, in conformity with the rules of stability.

But this choir opens into the transept equally in width to the principal nave. The architect saw that the great archivolts received by the pillars *a c* would exercise an active pressure upon the first pillar, *g*, of the choir, which is longer propped at the height of these arcades. First of all he increased the area of this column; then he decreased the space of first bay, B.

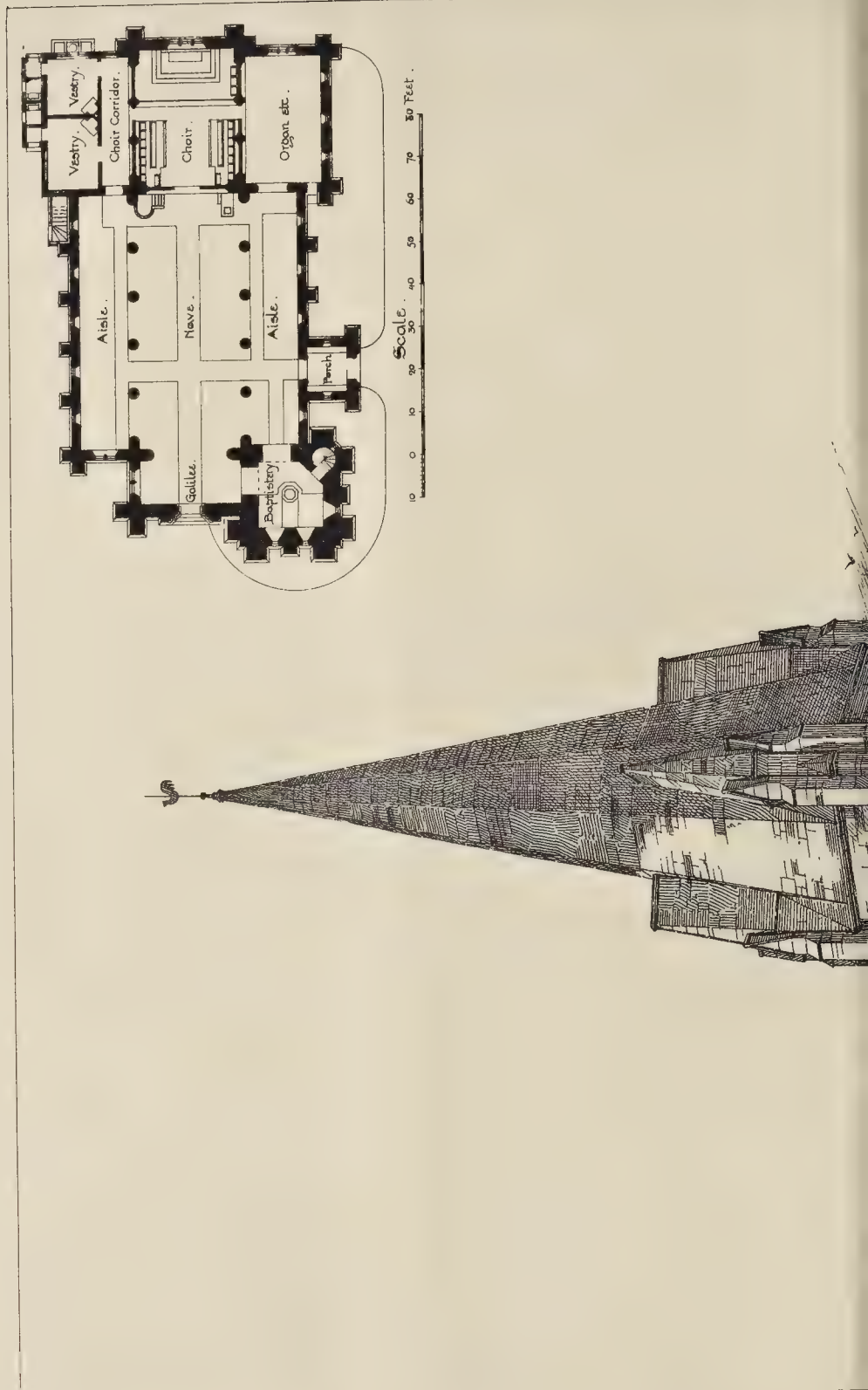
At G, the architect intended to erect a tower over the bay of the transept, and therefore

\* A paper by Mr. D. J. Blow, Travelling Student of the Architectural Association, read by him at the meeting of that body on the 17th inst., as elsewhere mentioned.

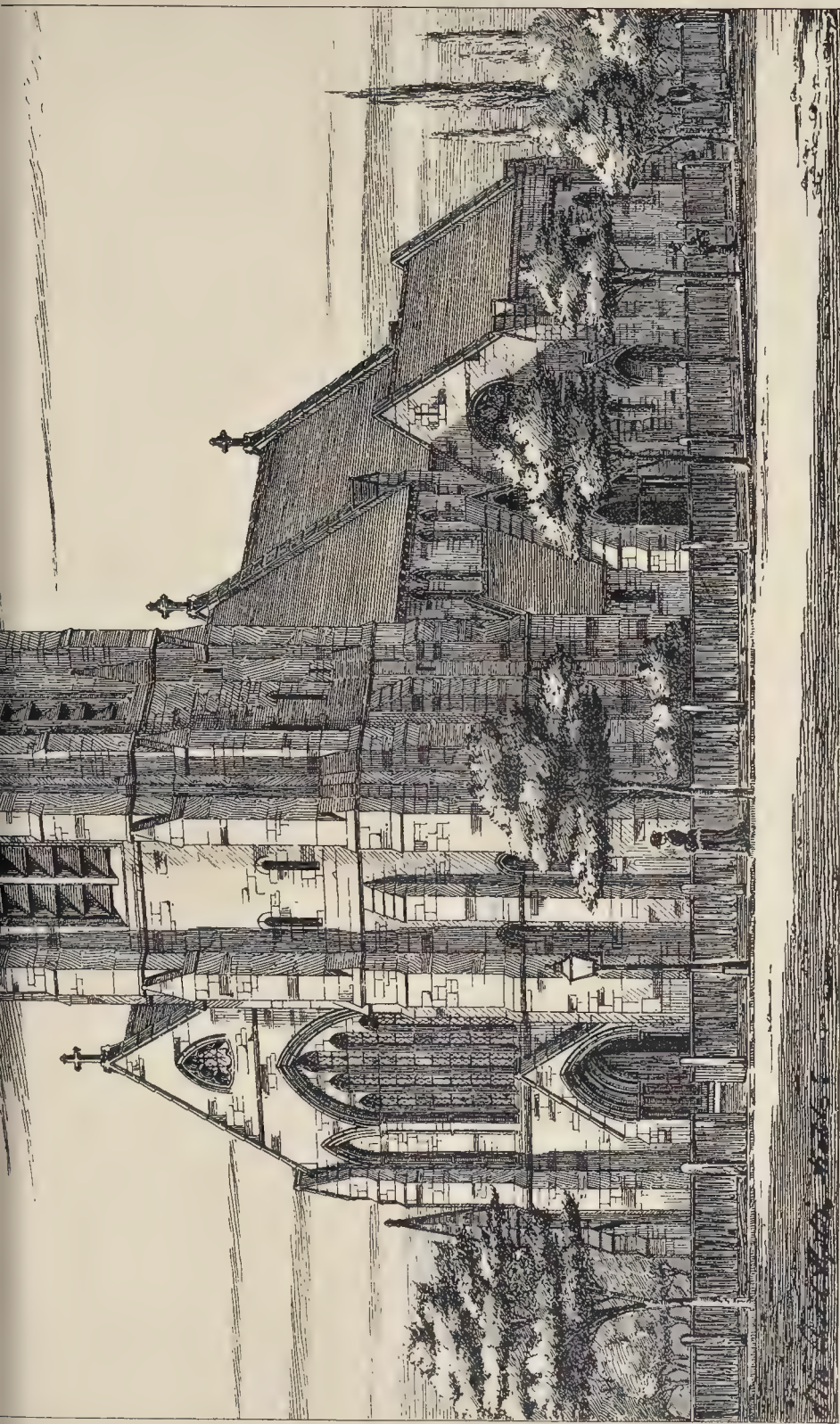




THE BUILDER, MAY 26, 1889.





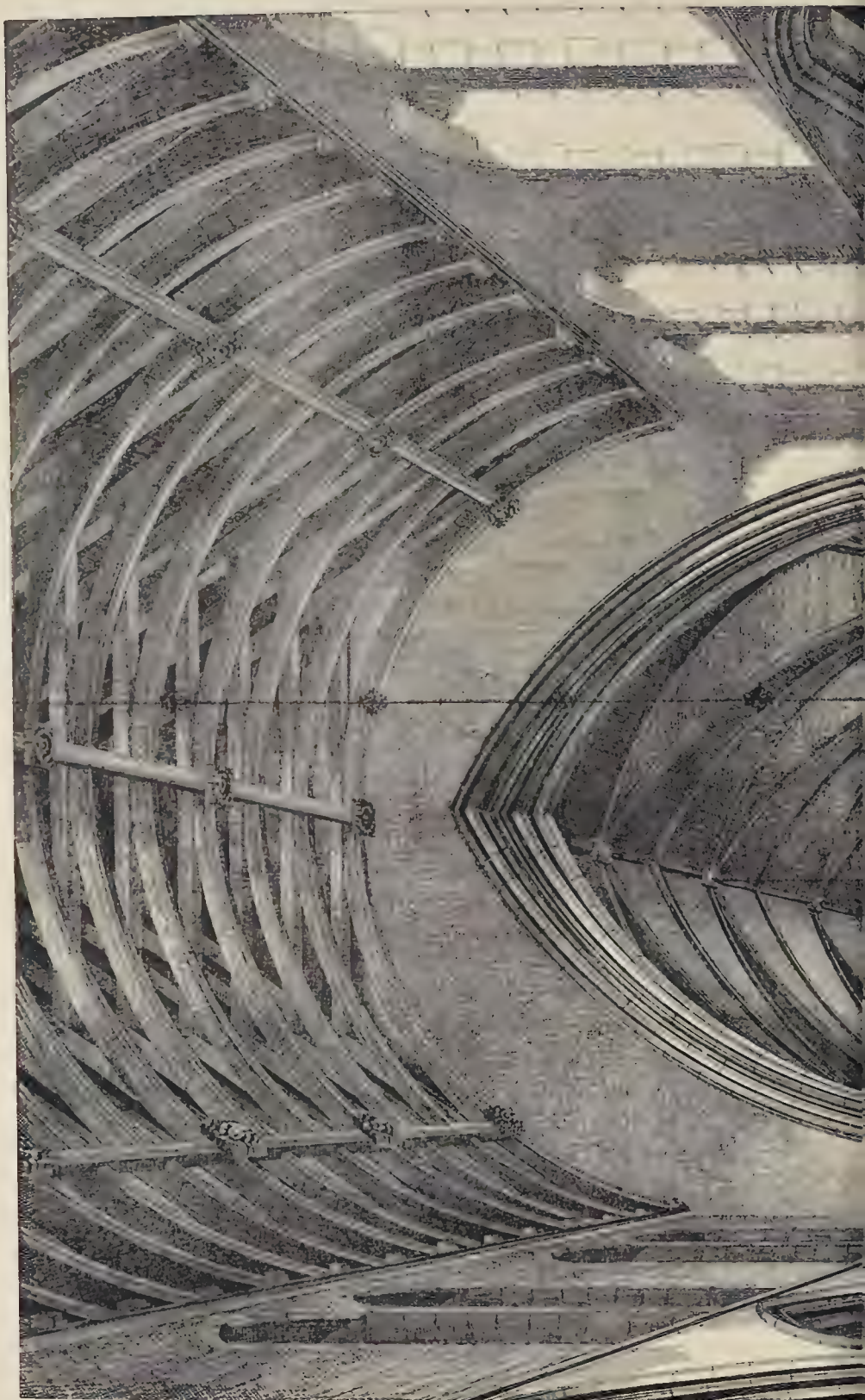


ST. LUKE'S CHURCH, RICHMOND.—MRS. GOLDIE, CHILD, AND GOLDIE, ARCHITECTS.  
EXTERIOR VIEW

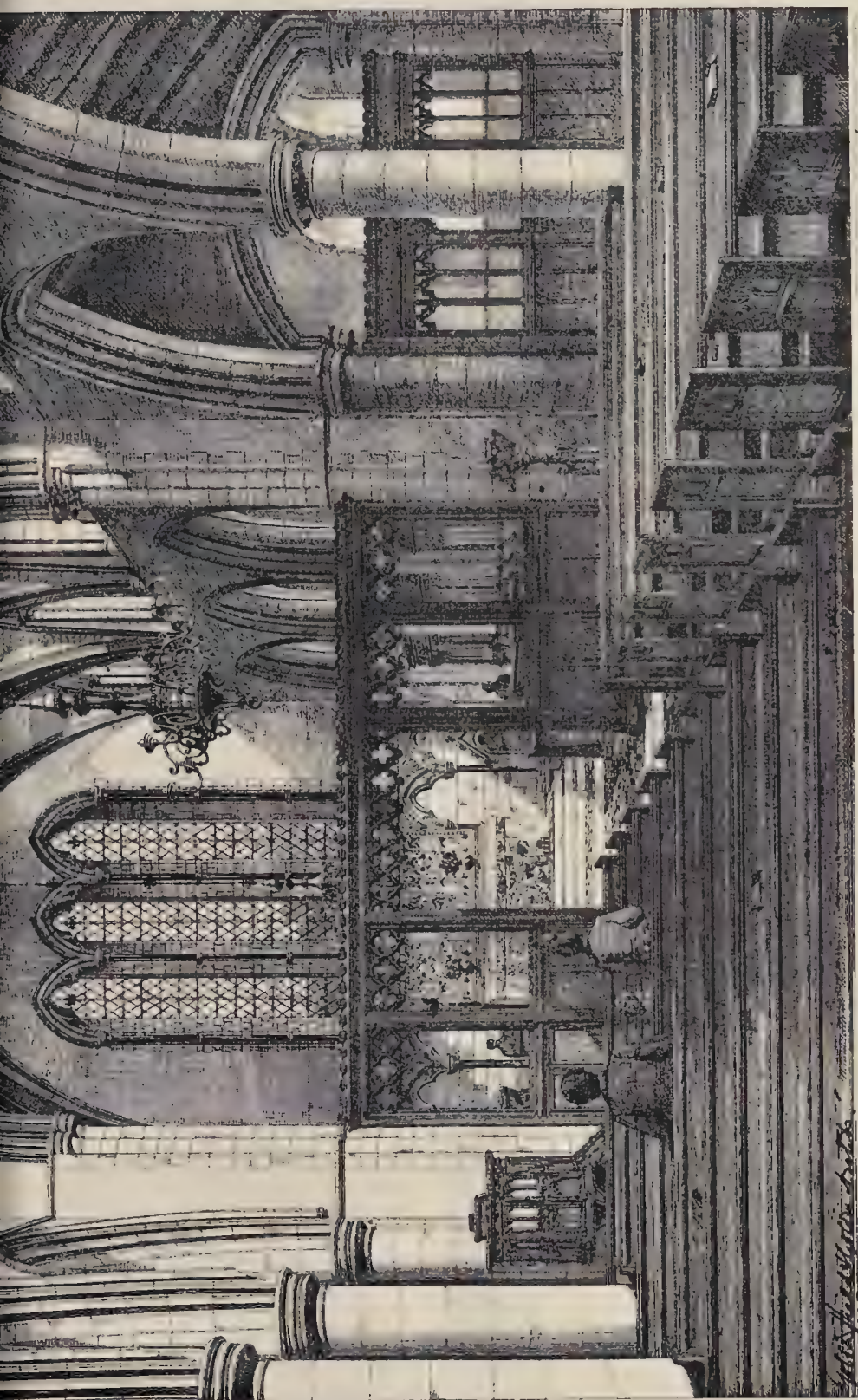












ST. LUKE'S CHURCH, RICHMOND.—MESSRS. GOLDIE, CHILD, AND GOLDIE, ARCHITECTS.

INTERIOR VIEW



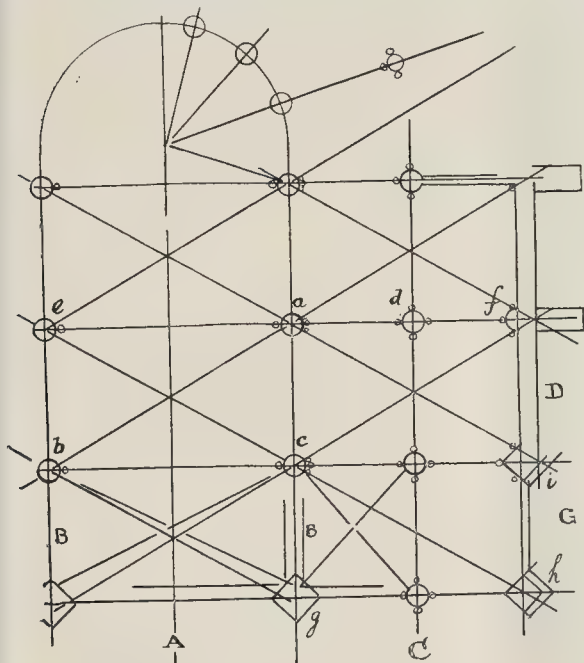


lengthened the pillars  $h$  and  $i$ , as shown in drawing.

Thus we see some of the relations existing between the axes and outlines of the plan, which we will find are again in harmonious relation with the elevation. Taking the base  $e$  in elevation, and constructing on the base formed between the axes of the pillars a number of equilateral triangles, giving a series of lozenges, the apex  $f$  gives the height of the spring of the archivolts of the aisles; the apex  $b$  of the angles, whose base is taken at the height of the astragals of the small engaged shafts, gives

architecture of Beauvais Cathedral, he was not fond of turning architectural into geometrical or mathematical problems, finishing up with "Q. E. D." In his experience any attempt of the kind usually ended in a *reductio ad absurdum*. A notable feature in Beauvais Cathedral was the kind of clearstory over the aisle which ran round the *chevet*, beautifully illustrated in Burges's book of architectural drawings. He would recommend any student who wanted to send in a drawing as candidate for probationer at the Royal Academy to copy Burges's drawings of Beauvais. The Cathedral of Beauvais was one of the

Pite had said, he (the speaker) thought that there was something to be said in favour of the triangulation theory. If there was ever a man in this world against whom Mr. Pite ought not to say a word it was Albert Dürer,—(laughter),—but Albert Dürer was strongly of opinion, and followed up his opinion by his practice, that the human figure, and even portions of the human



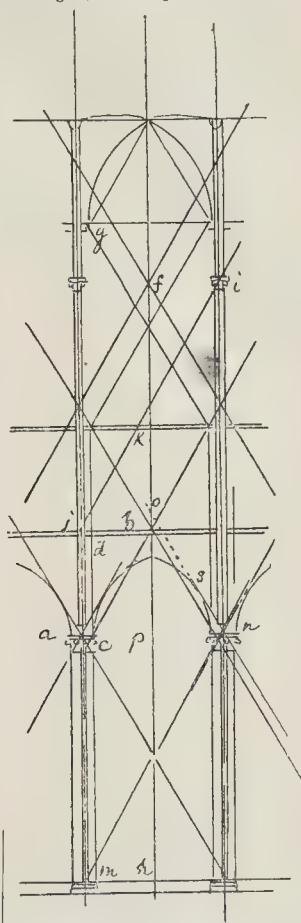
Plan of Part of the Choir, Beauvais Cathedral.

the height of the lower string-course of the triforium; the intersection of the vertical lines  $d$  with the sides of the triangles gives the height of the upper string-course of the triforium; the apex  $f$  gives the height of the spring of the grand vaults; and the points of intersection  $g$  gives the height of the spring of the wall arches; that the height  $h$   $p$  equals the width of the grand nave between the axes of the pillars; that the height  $b$   $k$  of the triforium equals the height  $p$   $b$ ; that the height  $b$   $f$  equals the height  $h$   $p$ , or the width of the nave between axes. It will follow equally that the line  $m$   $n$ , is equal to the base of the triangle; that is to say, to the distance between the axes of the pillars in couples of the bays, which gives an appearance of stability to the pillar, which is braced, so to speak, by imaginary sides, which the eye pictures without being aware of it; that the extension of these sides are tangential to the archivolts at  $s$ ; that in the same way the capitals which carry the principal vaulting arches are braced by the sides,  $j$   $i$ ; thus we see what beautiful harmonious relations exist between the elevation and plan. I would also say that the profile of the mouldings to bases and others are drawn to an outline of an angle of 60 deg.

Mr. A. B. Pite, in moving a vote of thanks to Mr. Blow, said he did not think there was anything to be gained by the triangulation theory which Mr. Blow, evidently inspired by M. Viollet-le-Duc, had taken up. At one time he (the speaker) thought there was something in that theory, but after testing it he had come to a different conclusion. While he could not help admiring the courage of a Travelling Student in taking up that theory, and endeavouring to work it out with reference to the beautiful ar-

loftiest in France,—the loftiest, he thought, excepting Bourges. Its appearance of shortness was no doubt due to its great height. He remembered that the late Mr. Street, in his Royal Academy lectures, spoke rather dubiously about the craving for height which was manifested by the builders of the French cathedrals. The builders of Amiens, Reims, Beauvais, and Bourges all seemed to make it their one object to carry their buildings up to the sky. The effect of these lofty buildings, internally, was not satisfactory. Mr. Street stated that he happened to be one day in Amiens Cathedral, and the next day he was in Exeter Cathedral. Although Exeter Cathedral was a comparatively low, dumpy-looking building, probably hardly one-third the height of Beauvais, Mr. Street declared that the internal effect at Exeter was perfect in its quality of proportion. The long aspiring lines of the vaulting-shafts of the choir at Beauvais seemed to have the appearance of bulging inwards half way up, owing, no doubt, to the absence of an entablature. He (the speaker), when he was at Beauvais, went up on the leads and around the gutters, and the number of tie-rods to be seen holding the buttresses together was alarming. They were evidently put in at the time of the construction of the work, and if they were really necessary, the work ought never to have been built. In conclusion, Mr. Pite warmly complimented Mr. Blow upon his drawings, which had evidently been made *con amore*. He had been trying to sketch in pencil without showing the hard lines, and in that matter he had set an example worth attention by them all (applause).

Mr. A. Needham Wilson said he had been greatly delighted with the paper which Mr. Blow had read. Notwithstanding what Mr.



figure, should be drawn on the basis of a system of triangles. Seeing that the results of that geometrical method had been the production of such marvellous works as Albert Dürer had left us, he thought it would perhaps be as well for them all to study geometry a little more than they did (hear, hear).

Mr. Baker commended Mr. Blow for the very excellent full-sized sections of mouldings which he exhibited on the screen, and told an amusing story about the late Sir Gilbert Scott's enthusiasm on the subject of mouldings.

Mr. A. H. Hart, as a former Association Travelling Student, said he thought Mr. Blow had done well to confine his attention to one great building, and to work at it thoroughly. He believed that that course was the best to pursue (hear, hear).

Mr. Owen Fleming said that with regard to the triangulation theory, there was to be seen at Louvain an actual drawing from which a Mediaeval church had been built, but it was without any triangles or squares or any other geometrical figures, and was, in fact, a mere rough sketch such as a mason might make. He was very sceptical about the triangulation theory, believing that those instances to which it seemed to apply were mere coincidences. At any rate, he was thinking some day of taking a modern design which he knew had not been based on triangles, and seeing how the theory could be applied to it (laughter).

Mr. H. O. Cresswell said he, too, thought Mr.



Blow had done well to confine his attention to the measuring and study of one particular building. As to the vexed question of triangulation, he did not think it was possible to find out whether the old buildings were designed on such a basis or not. It was a favourite theory of the late Viollet-le-Duc that they were designed in that way, and that distinguished architectural writer had given a great deal of matter in support, or in partial support, of his theory. Many parts of important Medieval buildings had apparently been designed on some sort of harmonic scale, just as Classic architecture was based on a system of harmonic proportions. He was glad to hear that Mr. Blow intended to pursue the subject, and he hoped he would be able to work it out to a satisfactory conclusion (hear, hear).

The Chairman (Mr. H. D. Appleton) having made a few remarks, in the course of which he said that he thought it would be a very useful thing if the paper that had been read should induce the members to set to work to consider the best means of studying the proportions of buildings, and in which he likened the controversy about the triangulation theory to the cryptographic theory of the authorship of Shakespeare's works, the discussion was continued in a somewhat desultory manner, being spun-out, in fact, to fill up the time occupied in waiting for the scrutineers' report as to the election of the officers of the Association. In the course of these desultory remarks, one member suggested that possibly some light would be thrown on the triangulation theory by a close study of Moorish architecture. Mr. A. B. Pite, in the course of some further remarks, referred to Mr. J. L. Pearson's six churches in London and the neighbourhood as buildings eminently worth study for their proportions, although he believed triangles had nothing to do with them. The design of one of those churches (that of St. John, Red Lion-square) was largely influenced by considerations connected with claims to light and air by neighbouring property-owners. Mr. H. W. Pratt said that he could not resist the conclusion that some geometrical system of design in buildings was used by the old builders. The vote of thanks having been put from the chair and carried with much heartiness.

Mr. Blow replied to some points raised in the discussion, after thanking the members for the kind way in which they had received his paper. He said his notes were less complete and full than they would have been had his work been finished, but it was not finished, and he was about to return to it. He must thank the members, and particularly Mr. Pite, for the commendation they had passed upon his drawings. He had been brought up to draw with the usual hard line, only admired, as William Burges said, by "parents, guardians, and idiots;" but Professor Ruskin had shown him that a more artistic method of drawing would not be less, but more architecturally correct, as might be, witnessed in the inimitable drawings of old Front. He not only thought, with Mr. Pite, that one must design in perspective, but that one must design in light-and-shade also (hear, hear). One could not design in light and shade until one had learnt to draw in light and shade (hear, hear). How one could almost read Front's drawings, feel their age, and measure the very heights, depths, and distances of his buildings, from the artistic feeling and value of every line! With regard to sketching, he advised his fellow students not to content themselves with sketching only architecture. Let them occasionally go to nature and draw a leaf or a flower; they would be all the better for it, and would put more real feeling into their work. How often did they see designs for foliated capitals, &c., got out in architects' offices without the slightest knowledge of what the actual natural leaf was like! With regard to the tie-rods at Beauvais Cathedral, M. Viollet-le-Duc had said distinctly that the tie-rods of the buttresses were at first meant to be of only temporary service; but the building was very hurriedly run up, the builders seeking to emulate those of Amiens in regard to speed. The local stone, though it had become hard with exposure, was, when first quarried, a very poor material, obtainable only in small pieces, and it was not thought expedient to remove the tie-rods: they were therefore left, and had remained ever since. In conclusion, Mr. Blow said he did not believe that our forefathers could have produced the magnificent structures they had left us had they not studied the harmonious relations of all parts of their buildings.

#### ARCHITECTURAL SOCIETIES.

*Birmingham Architectural Association.*—At a well-attended meeting of this Association, held on Tuesday last, Mr. W. H. Bidlake, M.A., A.R.I.B.A., read a paper entitled "Buttresses, their History, Theory, and Design." The paper was illustrated by some diagrams and a large number of very admirable drawings, the former showing the mechanical forces to which buttresses are subjected, the latter being excellent examples of their history and design. Mr. Bidlake dealt with the history of buttresses from the earlier times, when mass of material gave the necessary strength, to the latter days, when a better scientific knowledge made it possible to use a lighter and more ornate form, and pointed out the honesty with which the buttresses were made throughout the Middle Ages of value in the design of the buildings, though evidently props to sustain the vaulted roofs. The mechanical theory of buttresses, and its government of their external forms in the Middle Ages, with details of the constantly-varied forms adopted for their ornamentation, were exhaustively described, and Mr. Bidlake closed his paper by a comparison showing that in the decadence of Gothic architecture it was true of the buttress, as of the art as a whole, that constructed ornament took the place of ornamented construction. A hearty vote of thanks to Mr. Bidlake for his able and admirably-illustrated paper was unanimously passed, and this being the closing meeting of the session, a vote of thanks was also passed to Mr. Doubleday, who retires from the office of vice-president, for the able manner in which he had filled that office for the past two years. The following gentlemen were declared elected for the various offices mentioned for session 1889-90:—President, Mr. T. Naden; Vice-President, Mr. W. H. Lloyd; Hon. Treasurer, Mr. T. W. F. Newton; Hon. Librarian, Mr. W. H. Bidlake, M.A., A.R.I.B.A.; Hon. Secretary, Mr. H. R. Lloyd, A.R.I.B.A.; Hon. Auditors, Messrs. A. T. Powell, Chartered Accountant, and B. V. Hirst. Committee:—Messrs. C. E. Bateman, H. Beck, W. Doubleday, W. Hale, F.R.I.B.A., W. H. Kendrick, H. H. McConnell, and F. Barry Peacock.

*Sheffield Society of Architects and Surveyors.*—On the 14th inst., the second annual general meeting of this Society was held in the School of Art, Arundel-street. Mr. Flockton, the retiring president, presided, and there was a large attendance of members. The report and balance-sheet were read. The former showed that the Society now consisted of over 70 members, and the latter that there was a substantial balance in the bank. On the motion of Mr. Davidson, C. E., seconded by Mr. Smith, both were adopted, and it was decided to print and circulate them. On the motion of Mr. Smith, a hearty vote of thanks to the retiring officers was agreed to. Mr. Smith especially eulogising the services of Mr. Flockton, who, according to rule, now retires from the chair. Mr. Flockton spoke of the great satisfaction he had received at the state of their society on the close of his two years of office. He should look back on them with great pleasure, and he believed the work that was being done would greatly benefit their profession, and give it increased status in the public opinion of their fellow-townsmen. A ballot then took place, Messrs. Benton and W. C. Fenton being appointed scrutineers. The following gentlemen were elected for the season 1889-90:—Mr. Frederick Fowler, President; Mr. C. J. Innocent, Vice-President; Mr. J. B. Mitchell-Withers, Treasurer; and Mr. C. Hadfield, Hon. Secretary. Messrs. T. J. Flockton, W. F. Hemmell, E. M. Gibbs, J. D. Webster, and Ed. Holmes were elected Members of Council. At the close of the general meeting the Vice-President, Mr. C. J. Innocent, took the chair, and introduced Mr. H. Stannus, F.R.I.B.A., of London, who delivered an interesting lecture on "Storiation in Architecture." The lecturer pointed out that all great works of art, literature, poetry, music, and the like, had a central idea permeating and linking them together. Storiation was really the art of making architecture interesting and pleasing. The lecturer went through the history of the arts from the earliest attempts of barbarians and savages, who, he said, like young children, naturally preferred to draw living objects, such as men, animals, and the like,—to the works of the Egyptians, Assyrians, Greeks, and Romans, of the Early and Middle Ages, and the Renaissance, down to the present day. He gave the

chief characteristics of the different periods, and showed how the arts, and especially architecture, told the story and characteristics of a people. In the days before printing art was didactic. The churches and other buildings were the poor man's books. From these he learned his scripture history and religion. The lecturer urged on his hearers (especially architects) to try and never miss an opportunity of inducing their clients to spare money for a work of art sculpture, or painting. This might often be done by not over-ornamenting buildings with unmeaning design. He instanced the work of a clever Sheffield sculptor, Creswick, on the Hall of the Cutlers' Company in London,—a sculptured frieze illustrative of the cutler's craft. It was so true to life and so real that he recognised it must have been the work of a Sheffield man. The lecturer next described the sculptures of the Parthenon, the Greek vases and coins, the works of the Romans, the painting and sculptures of the great Italian masters, and the works of the French, Belgian, and other historical painters, especially noticing the paintings of Flandrin in Paris. They were amongst the finest works of religious art in existence, because the painter believed in his work. On the motion of Mr. J. B. Mitchell-Withers, seconded by Mr. C. Hadfield, a hearty vote of thanks was awarded to Mr. Stannus.

*Edinburgh Architectural Association.*—After the annual general meeting of this Association on the 16th inst., in the Architectural Hall, 42, George-street, a discussion took place with regard to the Art Congress to be held in the city in November, under the auspices of the National Association for the Advancement of Art and its Application to Industry. Professor Baldwin Brown, who presided, opened the discussion with a paper in which, in addition to stating the objects of the Association and the procedure of its meetings, he made several suggestions regarding the work of the forthcoming Congress. He emphasised the point that an art congress could have no better theme than aiding the arts in working in union, particularly from an architectural point, in the direction of worthy civic work. Having briefly alluded to the architecture of the Old and New Town of Edinburgh, and the more recent styles of building in the West End and the suburbs, he said we wanted more patriotism in such matters,—a quickened sense of personal possession on the part of the public in civic monuments, and a closer union between the architectural profession and the public. The Congress would do well, he considered, if it could send a fresh thrill of animation through all the classes of the artistic community (applause). If it could help in any way to make art no longer a mere luxury, but a language, he thought the Congress would not have been held in vain (applause). He urged that it would be better for the Congress to take up a few subjects, and deal with them thoroughly, than to take up many subjects which would only be slightly touched; and, further, that in order to make the proceedings generally valuable, craftsmen should be allowed to share in the deliberations. He added that he might say that the Congress was bound to be a success of a certain kind, in the way of attendance, and in the number and individual quality of the papers. To make the success lasting, they must assert their position as representatives of important art centres in Scotland. Above all, they must not let the Congress degenerate into a mere social function, or a Babel of empty talk, or an exercise ground for airing worn-out artistic fads (applause). Dr. Rowand Anderson suggested that there might be formed a collection of plans and views of the city of Edinburgh for the inspection of visitors at the Congress. There was, he said, a very large collection in the possession of the Board of Manufactures, and he had no doubt they would put them at their service. In the hands of individuals, also, there were many interesting views of Edinburgh and its buildings. Mr. G. Aitken pointed out that the Congress might discuss the subject of how art could be countenanced in schools. He regarded the subject as of importance, inasmuch as the young would be taught to form for after-use ideas regarding art in various forms. Mr. D. J. Vallance spoke of the desirableness of arranging meetings in the evening for the benefit of art-workmen throughout the city. Dr. Haycraft pointed out that arrangements might be made for visits in the afternoons to prominent places of architecture, and to pos-



## THE LONDON COUNTY COUNCIL.

sibly the art studios. Mr. Mavor, Glasgow, said he was sure many people in Glasgow were prepared to take a warm interest in the Congress, and there would be present a very strong contingent of them. He thought that the success of the Congress would depend very much upon the manner in which the programme was drawn up. A good deal of conversation also took place with regard to the duties of the Architectural Sectional Committee, Dr. Rowand Anderson, who is the convener of the section, bringing the subject before the meeting. It was indicated by the Chairman that the subject was, in the first instance, one for the General Committee, and he stated that a meeting would shortly be held to further the preliminary arrangements.—On Saturday afternoon last the members of the Association, to the number of about fifty, paid a visit to Arncliffe House and Temple Church. At Arncliffe House, where the party was received in Mr. Dundas's absence by Mr. Cook, the steward, Mr. David MacGibbon acted as leader. The natural advantages of the valley of the Esk had all been rendered available in connexion with the site of the mansion-house, but what specially called for attention was the result of the foresight of the proprietor and of the artist—Mr. Wm. Adam—who guided him in laying out the park in 1726, at which time also the same artist prepared the plans of the mansion. The edifice showed the arrangement, common at that period, of a central block containing the principal apartments, and two wings, in which were situated, on opposite sides, the kitchen and stable offices. The wings were originally joined to the central block by corridors, which, however, being found inconvenient, were altered to two stories in height. The kitchen is about 100 ft. from the dining-room, and in order to avoid the constant running backward and forward of the servants, a small railway had been laid down from the kitchen to the service-room, and dinner was brought up on miniature trucks driven by a windlass. After a short stay at Arncliffe House, the party continued their walk through the policies and up the valley to Temple Church, where they were received by the Rev. J. W. Blake, the minister of the parish. Mr. Archibald Macpherson, who took Mr. MacGibbon's place as leader, explained that the small rural church, roofless and ruinous as they now saw it, was all that remained to indicate the seat of the preceptory—the headquarters in Scotland—of the Templars. The building as it now stood could not, however, be attributed to the time of the settlement of the Templars in that place, which was the twelfth century, because the detail generally was that of the following century, and it was conjectured that the Knights of St. John had more to do with the reconstruction of the church than their predecessors. Before the erection of the present parish church, and for two hundred years and more, the building was occupied as the parish church.

#### CASE UNDER THE METROPOLITAN BUILDING ACT.

##### WOODEN STRUCTURES.

MESSES. CURRY & SHREEVE, timber merchants, of Harrogate-street, Peckham, were summoned on the 16th inst., at the Lambeth Police Court, before Mr. Partridge (the sitting magistrate), by Mr. Henry Jarvis, District Surveyor, of St. Giles's, Camberwell, for having erected on their premises a shed building, open at the sides, the roof being constructed of combustible material and supported with framed woodwork, without having given two days' notice to such Surveyor as required by the 1884 and subsequent sections of the Metropolitan Building Act, 1855.

The presiding magistrate, on the evidence given, and after examining the drawing produced by the District Surveyor, held that the erection was a building within the meaning of the Act, and thereupon ordered the defendants to pay a fine of 5*l.*, and allowed 2*s.* costs in the case.

**The Institute Council Election.**—A good many members of the Institute have probably received a lithographed letter in regard to the list of names nominated as Members of Council, in the course of which it is stated that "one of the architects nominated among the Fellows has not even yet been elected a Fellow." We are authoritatively informed that this is a mistake: the fact is not so.

**Recent Patents.**—Our list for this week is held over for want of space.

At the ordinary weekly meeting of the London County Council, held on Tuesday last in the Council Chamber, Guildhall, Lord Rosebery, the Chairman, read a letter from the Town Clerk (Sir J. B. Monckton) stating that the Court of Common Council had unanimously agreed to comply with the request of the County Council for the use of the Guildhall for a further period of three months, but pointing out that beyond August 7 next the permission could not be extended, as the Guildhall would be in the hands of workmen to effect necessary alterations. It was agreed that the thanks of the Council be conveyed to the Corporation for their courtesy. Thanks were voted to the Corporation for their courtesy in the matter, and the Chairman directed the special attention of the Council Chamber and Offices Committee to the intimation contained in Sir J. B. Monckton's letter.

**Cost of New Improvements.**—The Finance Committee recommended that under certain conditions 6,000*l.* be lent to the Poplar District Board for an approach to Brouley-bridge, and 4,000*l.* to the Guardians of St. Saviour's Union, for alterations, additions, and drainage and cooking and heating apparatus at Newington Workhouse. Lord Hobhouse moved as an amendment,

"That, except in the case of applications already entertained, or under other special circumstances to be reported to the Council, no application for loans shall be sanctioned by the Council until Parliament has declared that the burden of such new loans shall be borne in such manner as Parliament shall decide with reference to local taxation in London."

After a long discussion, this amendment was rejected by 68 votes to 39.

**Gates and Bars in London.**—The Highways Committee recommended

"That it be referred to the Parliamentary Committee to take steps to obtain the necessary powers for the Council to remove all bars, gates, and other obstructions now existing in the London streets and thoroughfares."

Mr. Haggis, in moving the adoption of the report, stated that the Committee were unanimous that the time had come when a determined effort should be made to remove these obstructions, of which there were about 230 within the metropolitan area. In many cases they had existed since the beginning of the century. At that time, perhaps, no inconvenience arose from them, but they were not to be tolerated in this busy age, as they caused enormous loss in business. London had spent millions in street improvements, and in opening up communications, and yet these thoroughfares remained useless to the public. He maintained that the obstructions ought to have been abolished in 1855, when London government was consolidated. Spasmodic efforts had been made for upwards of twenty years to get rid of these obstructions by Vestries and District Boards. In 1885 the Metropolitan Board of Works introduced clauses in their Various Powers Bill to give the Board power to remove them, but in the face of opposition the clauses were withdrawn. The recommendation of the Committee was adopted.

**The Metropolitan Water Supply.**—The Special Committee on Water Supply presented the following report, which was approved:—"Your Committee have to report they have proceeded on the reference of the Council of March 19,—

"To consider the steps to be taken, if they so advise, as to acquiring the undertakings now supplying London with water, whether new sources of supply should be sought on by the Engineers of the Council, and if so, what time would be required for that purpose, having in view the reports of several Royal Commissions; such report to be presented not later than June next, in order to permit the requisite notices to be considered, prepared, and given in November for the ensuing season."

It appears to your Committee that the first step necessary to enable them to deal with this important matter should be the institution of an inquiry as to the whole question of the water supply of London. As such an inquiry would necessarily involve considerable expense, your Committee called upon the Solicitor of the Council to advise as to the statutory powers possessed by the Council to expend money for such a purpose, and the Solicitor advised that no such power now exists. Your Committee have also ascertained that the Bill which has been prepared by the Parliamentary Committee for the purpose of conferring further powers upon the Council with respect to the water supply of London provides for the introduction by the Council of Bills into Parliament on the subject, and it is the duty of the Council to carry the expenses of making and carrying on inquiries and negotiations relating to such supply. In these circumstances your Committee have passed the following resolution—

"That it be reported to the Council that as the Committee are advised by the Solicitor that the Council has no power to incur any expenses in connection with any inquiry as to the matter referred to them, the Committee are of opinion that such inquiry must not be entered upon until the Council has obtained from Parliament power to incur the expenditure necessary in making such inquiry." Your Committee, however, consider it desirable that the Council should be furnished with the information relating to the water supply of London which is contained in a large number of reports of Commissions and Committees, and in various other Parliamentary papers, copies of which are in the

possession of the Council. This information is voluminous, and it appears to be desirable that a short digest of that portion of it which will be the most valuable to the Council should be prepared, and this can be done by the existing staff without incurring expense. When the digest has been prepared, the Committee propose to submit it for the information of the Council."

**The Sewage Precipitation Works at Barking Outfall.**—The Main Drainage Committee reported that they had received the usual fortnightly report with reference to the precipitation works at the Barking Outfall, and, although the statement was not comprised in the report, they had reason to believe that the progress made would allow, within a month or five weeks, some partial trials of machinery. The Committee were of opinion that by the end of July the precipitation works might be expected to be in operation.

After a long discussion arising out of the Local Government and Taxation Committee's report, as to the incidence of rating, the Council adjourned.

## HOLIDAY HOMES.

SIR,—As in the alterations and erections of its many buildings the Ragged School Union has frequently had the valuable aid of many of your readers, they may now be disposed to help us in the main item of our summer's work—namely, providing our poorer little protégés with a fortnight's holiday in the country. The children are located in homes some of which have been specially built and endowed for the purpose, others are placed in houses hired for the season, and the remainder with respectable families. We are now making a special appeal for a new holiday home we want to build at Folkestone. Apart from that, our ordinary holiday homes' needs are gifts of money, parcels of new and second-hand clothing, boots, and offers of homes; so that in some way most of your readers could help us, and many of them will doubtless earn our gratitude by doing so. JOHN KIRK, Secretary.

Ragged School Union, Exeter Hall, Strand, W.C.

## BOOTLE POLICE-COURT COMPETITION.

SIR,—Hearing, through what I believe to be a reliable source, that in this competition the Liverpool Society of Architects have sent to the committee the names of several of its members for selection as professional assessors, I, as an interested architect, at once enter my protest on the following grounds:—

Such a selection, if made by the committee, would doubtless be all the "L.S.A." could desire, but to the others (in my opinion the great majority) it would nullify the competition as not being in accordance with the terms which stipulate an "independent" assessor.

A MANCHESTER ARCHITECT.

## The Student's Column.

## TOWN DRAINAGE.

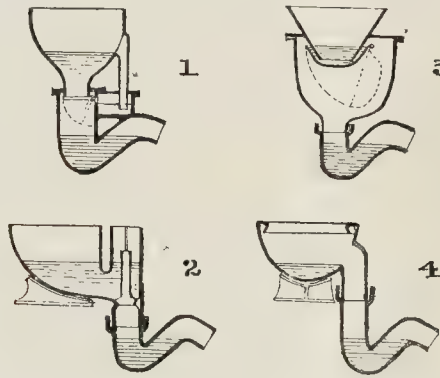
## XXI.—WATER-CLOSET APPARATUS.

**A** QUANTITY of water equal to about two gallons is discharged from a water-closet basin every time the water-valve is opened, which lets the water out of the cistern overhead into and through the basin, and the way in which this small body of water is discharged through the basin indicates the kind of closet, and gives a name to it,—as a valve-closet, a pan-closet, a wash-out, &c. The basin is supplied with water in several different ways, which are the same for several different forms of basin,—as, for instance, a valve-closet may be supplied through a water-valve on the supply-pipe near its lower end, or there may be no such valve; but it remains a valve-closet, the name being derived from the valve at the outlet of the basin. Misunderstandings occur sometimes by applying the term valve-closet to one in which the basin is supplied through a valve on the water supply pipe near its lower end.

There are four principal varieties of construction of a water-closet apparatus, two of which are valve-closets, although only one is called by that name. Another is the pan-closet, and the other form is the flush-out or wash-out. Each of these is varied in construction in detail by different makers, so that there is almost a numberless variety in all, but each may be referred to one or another of the four principal forms which are indicated by reference to the way in which a given quantity of water,—say two gallons,—is discharged through the basin. A valve-closet holds up the greater part of the water in the basin; the others only a small part of it, the greater part being discharged in a flush. Of the two forms of valve-closet, that alone retains the name which has the outlet of the basin closed



by a disc or valve underneath, as shown by fig. 1. In its general form it was invented by Joseph Bramah, the engineer, who invented also the hydraulic press. Since his time it has been improved in details so much that the valve is almost the only part which remains as of old. The quantity of water retained in the basin by the valve is about one and-a-half gallon, when a two-gallon quantity is let down from the cistern overhead. The valve is hinged on a pin which passes through the valve-box under the basin, and is turned by a horizontal lever outside, to the end of which the pull-up handle is attached. By the same action the water-valve is opened, being connected to the lever by another attachment, so that on the discharge of the one and-a-half gallon of water from the basin another equal quantity is let down into it, and this is followed by half-a-gallon more to fill up the unavoidable deficiency caused by the escape, out of the trap below, of about that quantity of water by reason of the momentum of the body of water falling through it from the basin. Two gallons is as much as is allowed by water companies when they have obtained Parliamentary powers to that effect, upon the plea of preventing waste of water, but it is hardly sufficient for a valve-closet, and the allowance should be increased to three gallons. Perhaps as much as that is used under the restrictions named, by repeatedly opening the valve.



The other form of valve-closet is that made by Mr. Jennings, of Lambeth, in which the outlet of the basin is at the side, closed by a plug, as in the second figure. About the same quantity of water is retained in the basin, and its discharge occurs in a similar manner. In this form the valve is kept close by its weight on the conical outlet; in the other the valve is closed by a weighted lever, which keeps it up to its seat. The pan-closet apparatus, fig. 3, is of different construction; the outlet of the basin dips an inch or two into water, held up in a pan which is hinged underneath the cover of an iron box, or container, which takes the place of the valve-box of the Bramah, or valve-closet, but is larger, this being made necessary by the depth of the pan having to be provided for when it is thrown back empty against the side of the box or container. The pan is keyed upon a pin which passes through the sides of the box, and is turned by a lever outside, as in the other case, having similar attachments to the water-valve. The pan contains about half a gallon of water. The emptying of this is followed by a flush of 1½ gallon, which clears out and refills the trap below. So far, it is well designed for its purpose. Its first practical defect is that the pan is not emptied directly into the mouth of the trap, unless the pan be thrown suddenly back, but its contents are poured upon the side of the container, and thence into the trap; while the water-flush which follows does not take the same course, but falls vertically from the basin into the mouth of the trap. The apparatus is capable of improvement in this respect by directing the stream of water from the basin into the course taken by that which is discharged from the pan. In the valve-closet, so-called, the disc requires but little room when thrown back, and the valve-box contains but little foul air; but the pan requires more room, and the container must be larger; it forms, therefore, a receptacle for a larger volume of foul air, some of which escapes

through the basin while it is being flushed out. It is endeavoured to prevent the air in the container becoming foul by connecting it with the outside air by means of a pipe. When such an apparatus adjoins an outside wall, and the pipe is therefore short, it should be provided, if made large enough, say, 1 in. diameter at the least; but the best improvement would be to direct the stream of the water flush upon the part of the container which receives the contents of the pan. There are, however, one or two other objections to a movable pan; the hole through which the pin passes in the side of the container wears larger by use and lets the foul air escape into the apartment; the pan sometimes does not hold water; and, generally, the workman ship of the movable parts is not good enough for long wear.

To get rid of these objections altogether, another form of basin has been devised, without any valve or movable part whatever, and in which, therefore, the water is not held up. In that respect it is not as good as the valve-closet, while it is better than the valve-closet when only two gallons of water are allowed. It is better than the pan-closet in having no movable parts of bad workmanship, and no large receptacle between the basin and the trap. The bottom of the basin is hollow, so as to retain water an inch or two in depth in the centre, the outlet being at one side, front or back. It is represented by fig. 4, having a trap

below the basin as in the other forms. Of these four forms of water-closet apparatus, shown by the figures, it may be observed that the trap is drawn alike in all. It is intended only to indicate that there is a trap in each case. Whether it should be of one form or another, or of one material or another, does not much affect the question with which we are at present concerned.

The valve upon the pipe which supplies the appointed quantity of water to a valve-closet basin may be situated near the lower end of the pipe, opened by the lever which opens the discharge-valve of the basin, and at the same time. The discharge-valve must be immediately shut, but the water-valve remains open long enough to let the given quantity pass through it. This is effected by—as one means—Mr. F. G. Underhay's vertical air-cylinder, within which a hollow piston moves up and down, having in the top a small hole which allows only a certain quantity of air to pass through it per second, the size of the hole being regulated by a screw so as to let less or more air pass through it in a given time. The time in which the given quantity of water can pass through the valve, according to its dimensions and the pressure of the water, is that to which the size of the air-hole is regulated. The hollow piston, or inner cylinder, having been raised by the lever, becomes disengaged, and falls again gradually, water continuing to flow through the valve into the basin as long as the piston continues to fall. In this way only a certain quantity of water can be used at a time, and in so far this regulator acts as a waste-preventer. Another form of valve which is also a waste-preventer is that of Messrs. Tyler & Sons, in which a vertical plunger covers the waterway of the valve when it is closed. The plunger is raised by the action of the lever which opens the basin-valve, in a manner similar to that of the other form. It descends automatically, whether its carrier descend or remain up, giving a rush of water immediately on the opening of the valve,

and a gradually diminished rate of flow to the end. The advantage of having the water-valve at the lower end of the pipe is that the water is brought down close to the point of delivery, and it begins to flow into the basin at once on the valve being opened; but it is not so good for a flush-out or wash-out basin as a plug-valve in the mouth of a pipe in a cistern overhead.

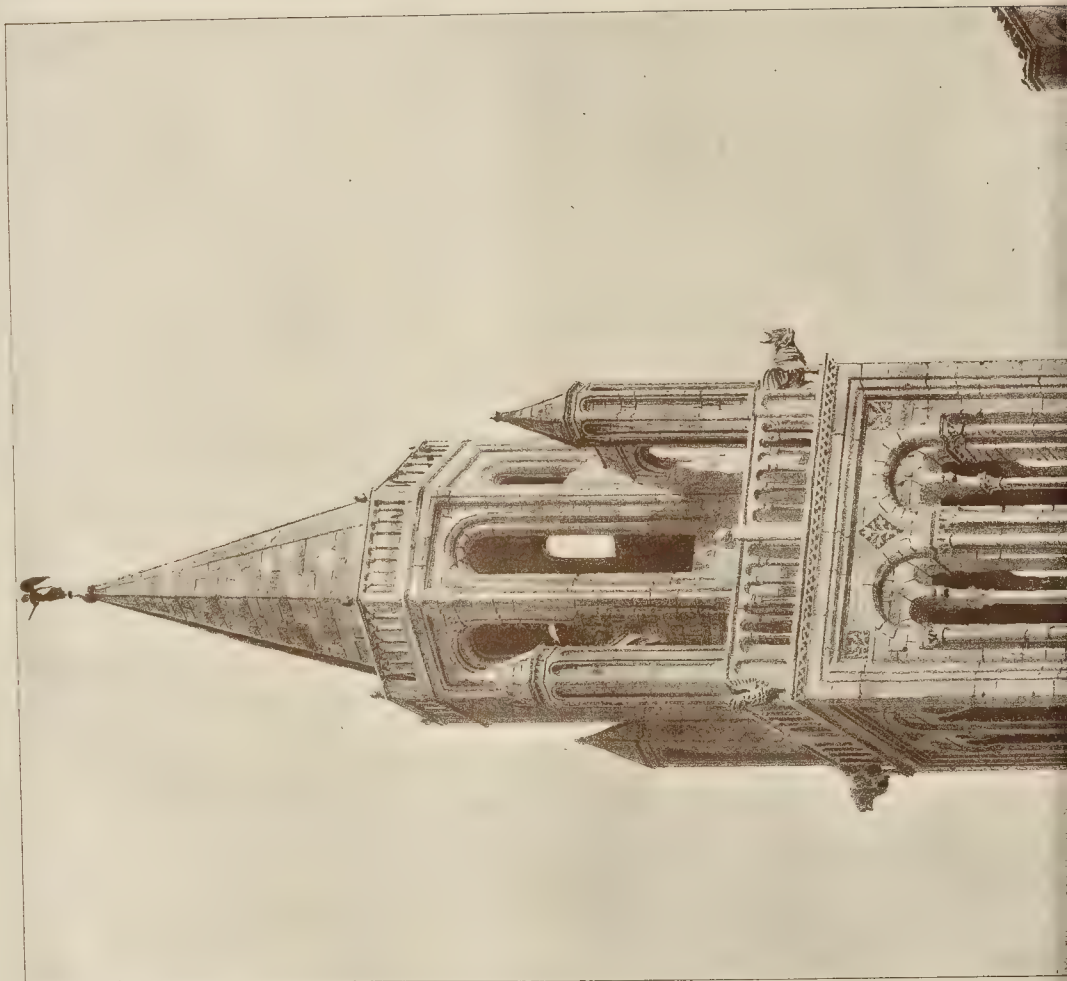
#### RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

|                                                                                                                                              |         |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>MAY 8.—By FARRERBROTHERS, ELLIS, &amp; Co. (at Northampton).</b>                                                                          |         |
| Northampton, near to—Two f. farms, containing 593a. 3r. 11p., r. £783. 18s. p.a. ....                                                        | £15,600 |
| Hackleton—Freehold house and shop, r. £11. 2s. 6d. p.a. ....                                                                                 | 200     |
| Piddington—Two f. cottages and schoolroom, r. £13. 12s. p.a. ....                                                                            | 220     |
| Two cottages and three plots of land, 6a. 3r. 23p. ....                                                                                      | 570     |
| <b>MAY 13.—By J. BARR &amp; SONS.</b>                                                                                                        |         |
| Islington—24, Park-st., u.t. 27 yrs., r. £26. 10s., r. £38 p.a.; and Barnsbury, 42, College-st., u.t. 27 yrs., r. £8. 10s., r. £42 p.a. .... | 490     |
| Lower Clapton—125 to 131 (odd), Powerscroft-rd., u.t. 99 yrs., r. £20. r. £100 p.a. ....                                                     | 775     |
| <b>By BENTINGFIELD &amp; TIDY.</b>                                                                                                           |         |
| St. Margaret's—Freehold maltings with plant, r. £100 p.a. ....                                                                               | 500     |
| <b>By MARLER &amp; BENNETT.</b>                                                                                                              |         |
| Regent's Park—23, Cumberland-ter., u.t. 36 yrs., r. £23. r. £180 p.a. ....                                                                   | 1,635   |
| <b>By J. J. WEBBER.</b>                                                                                                                      |         |
| Putney—9a, Charlewood-rd., f., with possession u.t. 99 yrs., r. £21. 10s., r. £22 p.a. ....                                                  | 370     |
| <b>MAY 14.—By ROGERS, CHAPMAN, &amp; THOMAS.</b>                                                                                             |         |
| Upper Norwood, Tudor-rd.—Tudor Lodge, f. ....                                                                                                | 1,620   |
| West Bromwich—7, Merrington-rd., u.t. 68 yrs., r. £2. r. £45 p.a. ....                                                                       | 341     |
| <b>By RUTLEY, SON, &amp; VINN.</b>                                                                                                           |         |
| Highbury Hill—No. 31, u.t. 48 yrs., r. £2. r. £20 p.a. ....                                                                                  | 800     |
| 29, Brunswick-rd., u.t. 51 yrs., r. £5. 6s., r. £26 p.a. ....                                                                                | 170     |
| <b>By R. &amp; H. LEMLEY.</b>                                                                                                                |         |
| Maidstone—Two plots of f. land, 2a. 2r. 10p. ....                                                                                            | 1,050   |
| <b>By VENTON, BULL, &amp; COOPER.</b>                                                                                                        |         |
| Fulham—61a, 67, 69, and 71, Marville-rd., u.t. 92 yrs., r. £21. 10s., r. £22 p.a. ....                                                       | 1,420   |
| Wandsworth Common, St. Ann's Hill—Barnmore Lodge, f. ....                                                                                    | 1,410   |
| <b>MAY 16.—By J. &amp; R. KEMP &amp; Co.</b>                                                                                                 |         |
| Soho—50, Frith-st., f., r. £24 p.a. ....                                                                                                     | 2,000   |
| Greek-st.—f.g.t. of £10, with reversion in 19 yrs. to s.r. £20 p.a. ....                                                                     | 710     |
| <b>By ELLIOTT, SON, &amp; BOYTON.</b>                                                                                                        |         |
| Holborn—29, Kingsgate-st., u.t. 53 yrs., r. £30. r. £157 p.a. ....                                                                           | 770     |
| Orford-street—19, Castle-st., u.t. 65 yrs., r. £18. r. £110 p.a. ....                                                                        | 1,360   |
| 4, Little Titchfield-st., u.t. 59 yrs., r. £18. r. £90 p.a. ....                                                                             | 980     |
| 13 and 13B, 64, Titchfield-st., u.t. 22 yrs., r. £21. r. £160 p.a. ....                                                                      | 1,070   |
| 11, Berners-st., u.t. 26 yrs., r. £70. r. £150 p.a. ....                                                                                     | 820     |
| <b>By FURNESS, PRICE, &amp; FURNESS.</b>                                                                                                     |         |
| Portland-place—16, Charlotte-st., u.t. 31 yrs., r. £24. r. £26 p.a. ....                                                                     | 750     |
| Russell-square—38, Woburn-pl., u.t. 31 yrs., r. £18. 18s., r. £120 p.a. ....                                                                 | 820     |
| 26, Great Corn-st., u.t. 10 yrs., r. £20. r. £70 p.a. ....                                                                                   | 150     |
| Hampstead-road—16, u.t. 32 yrs., r. £4. r. £7. 7s., r. £54 p.a. ....                                                                         | 565     |
| <b>By FARRERBROTHERS, ELLIS, &amp; Co.</b>                                                                                                   |         |
| Camberwell New-road—No. 312, u.t. 68 yrs., r. £7. r. £36 p.a. ....                                                                           | 370     |
| <b>By D. YOUNG.</b>                                                                                                                          |         |
| Brixton, Canterbury-rd.—The 1. of Hfira-cottage, u.t. 19 yrs., r. £20 p.a. ....                                                              | 100     |
| Clapham—324, South Lambeth-rd., u.t. 46 yrs., r. £7. r. £40 p.a. ....                                                                        | 800     |
| Wandsworth—5, Devonshire-rd., f., r. £41 p.a. ....                                                                                           | 640     |
| <b>MAY 18.—By LEMMAN &amp; Co.</b>                                                                                                           |         |
| Regent-street, Carnaby-st.—"The Ship" p.h., f., r. £75 p.a. ....                                                                             | 1,350   |
| "The Harp" p.h., f., r. £26 p.a. ....                                                                                                        | 1,200   |
| 32, Carnaby-st., f., r. £105 p.a. ....                                                                                                       | 2,400   |
| 29, King-st., f., r. £25 p.a. ....                                                                                                           | 1,450   |
| <b>By E. SIMMONS.</b>                                                                                                                        |         |
| Rotherhithe—13 and 15, Old-road, f., r. £35 p.a. ....                                                                                        | 420     |
| Clapham-road—20, Portland-pl. South, u.t. 31 yrs., r. £23. r. £30 p.a. ....                                                                  | 308     |
| Nine Elms—13 and 49, Everett-st., u.t. 14 yrs., r. £7. r. £42. 18s. p.a. ....                                                                | 85      |
| 67 and 69, Everett-st., u.t. 28 yrs., r. £7. r. £46. 18s. p.a. ....                                                                          | 210     |
| Carshalton—61 to 65, Harold-rd., u.t. 93 yrs., r. £12. 10s., r. £53 p.a. ....                                                                | 208     |
| <b>By NEWSON &amp; HARDING.</b>                                                                                                              |         |
| Barnsbury—33, Bellinla-villas, f., r. £25 p.a. ....                                                                                          | 750     |
| 1, Arundel-av., f., r. £25 p.a. ....                                                                                                         | 680     |
| Islington—349, Liverpool-rd., f., r. £25 p.a. ....                                                                                           | 630     |
| 47, 49, and 51, Essex-st., f., r. £161 p.a. ....                                                                                             | 2,460   |
| Stoke Newington—16, Abchurch-lane, f., r. £25 p.a. ....                                                                                      | 520     |
| <b>By PHILLIPS &amp; DYER.</b>                                                                                                               |         |
| Islington—39, Upper Park-st., u.t. 20 yrs., n.g.r. r. £36 p.a. ....                                                                          | 250     |
| <b>By H. J. BLISS &amp; SONS.</b>                                                                                                            |         |
| Bethnal-green—5, Bullard-pl., u.t. 41 yrs., r. £22. r. £26. 4s. ....                                                                         | 300     |
| 53, St. Peter's-st., u.t. 59 yrs., r. £2. r. £40 p.a. ....                                                                                   | 290     |
| <b>By DOWSETT &amp; Co.</b>                                                                                                                  |         |
| Hilacombe—Freehold fee farm rent of £18. 18s. ....                                                                                           | 380     |
| Freehold fee farm rent of £25. 4s. ....                                                                                                      | 515     |
| A plot of land, 5a. 0r. 14p. ....                                                                                                            | 230     |
| A plot of land, 12a. 0r. 20p. ....                                                                                                           | 1,350   |
| <b>MAY 17.—By RUSSELL &amp; PARRIS.</b>                                                                                                      |         |
| Finchbury-park—2, Moreland-st., u.t. 76 yrs., r. £5. 6s., r. £44. 3s. p.a. ....                                                              | 220     |





THE BUILDER, MAY 25, 1889.







DESIGN FOR COMPLETION OF CAMPANILE, ZARA, DALMATIA.—MR. T. C. JACKSON, M. A., ARCHITECT.

1881

24



|                                                        |       |
|--------------------------------------------------------|-------|
| By A. A. FIELD.                                        |       |
| Harrow-road, 4, Sixth-avenue, u.t. 84 yrs., g.r.       | £265  |
| Southend, Essex, "Minerva Hotel," c. r. £201           |       |
| p.s.                                                   | 3,250 |
| By GREEN & SON.                                        |       |
| Caledonian-road-12 and 13, Edward-sq., u.t. 49         |       |
| yrs., g.r. £10, r. £90 p.s.                            | 285   |
| 40a, 46 to 52, Edward-sq., u.t. 51 yrs., g.r. £30,     |       |
| r. £247, 18s. p.s.                                     | 1,820 |
| 53, Edward-sq., u.t. 51 yrs., g.r. £2, r. £40 p.s.     | 285   |
| 62, 64, and 66, Brompton Hotel, c. r. £5 yrs., g.r.    |       |
| £18, r. £118 p.s.                                      | 500   |
| 9, 9, and 10, Thornhill Bridge-rd., u.t. 52 yrs., g.r. |       |
| £21, r. £52, 10s. p.s.                                 | 615   |
| 1, Bury-st., u.t. 55 yrs., g.r. £5, r. £30 p.s.        | 245   |
| By REYNOLDS & EASON.                                   |       |
| Shoreditch, Norfolk-st., The "Norfolk Arms," f.,       |       |
| r. £90 p.s.                                            | 1,300 |
| Canonbury-4, Leconfield-st., u.t. 60 yrs., g.r.        |       |
| £5, 6s., e.r. £18 p.s.                                 | 360   |
| Rotherhithe-219, Lower-rd., u.t. 62 yrs., g.r.         |       |
| £7, 17s. 6d., r. £20 p.s.                              | 750   |
| Spitalfields-19 to 25, Westwood-st., 1 to 8 and        |       |
| 12, 12a, 12b, 2 to 5, Eastman-st., f., r.              |       |
| £613, 12s. p.s.                                        | 7,680 |

Contractions used in this list.—G.r. for freehold ground-rent; l.g. for leasehold ground-rent; i.g. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.s. for per annum; y. for years; d. for day; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

## MEETINGS.

SATURDAY, MAY 25.  
**Architectural Association.**—Visit to House in Kensington-court, 3 p.m.  
**St. Paul's Ecclesiastical Society.**—Visit to St. Albans. Train leaves King's-cross (G.N.R.) 2.41 p.m.  
**Church for the Preservation of the Memorials of the Dissolution.**—Seventh annual meeting, St. Luke's Girls' School, Church-street, Chelsea, 2.30 p.m.

MONDAY, MAY 27.  
**Surveyors' Institution.**—Annual Dinner, Holborn Restaurant.  
**Engineers' Association.**—Mr. H. Graham Harris on "Heat Engines other than Steam." IV. 8 p.m.  
**Co-operative Architectural Society.**—(1) Election of Officers and Council for the ensuing year. (2) Closing address by the President, Mr. E. Kirby, 7 p.m.

TUESDAY, MAY 28.  
**Institution of Civil Engineers.**—Annual general meeting to report of the Council, and to elect the Council and officers for the ensuing year. 8 p.m.  
**Society of Arts (Foreign and Colonial Section).**—Mr. J. S. Humbird on "The Westinghouse Alternating System of Central Station Electric Lighting in the United States of America." 8 p.m.

WEDNESDAY, MAY 29.  
**Society of Arts.**—Mr. D. G. Hoey on "The Science of Ventilation as Applied to the Interior of Buildings." 8 p.m.

THURSDAY, MAY 30.  
**Society for the Encouragement of the Fine Arts.**—The Guild of Handicrafts, 8 p.m.  
**Institution of Electrical Engineers.**—Discussion on Mr. W. M. Morley's paper on "Alternate Current Working." 8 p.m.

SATURDAY, JUNE 1.  
**Royal Institution.**—Professor W. Knight on "The Classification of the Sciences, Historical and Critical." 8 p.m.  
**Architectural Association.**—Visit to the New Buildings at Rton College, Mr. A. W. Blomfield, architect.

## Miscellaneous.

**The English Iron Trade.**—The English iron market continues quiet, but firm. The business in pig iron is limited to prompt orders. Merchants are, to some extent, underselling makers; but, as the latter are booked well forward, some to the end of the year, there is no giving way whatever on their part in prices. Although at present, trade in finished iron is limited, there is a generally steady tone in the market. Manufacturers in the North of England are not quite so tenacious; those of Lancashire and Staffordshire, on the contrary, are stiffer in their rates, which have a hardening tendency. Makers of tinplates, in which there is a slightly better tone, are very firm, and their attitude seems to gain strength by the proposed amalgamation of tinplate works in the Midlands. The movement would benefit South Wales. The steel trade is unchanged, active and firm. Ship-building and engineering remain brisk.—*Iron.*

**The North Sea-Baltic Canal.**—The work of excavating the immense lock at the mouth of the North Sea-Baltic Canal at Brunsbüttel, on the North Sea, will be commenced in a few days; 220,000 cubic metres of earth have to be excavated, and it is estimated that the work will occupy twelve months. Hamburg journals add that the German Emperor will shortly pay a visit to the works.

**Registration of Plumbers.**—We would call the attention of our readers to an advertisement which appears in our columns this week from which it will be seen that the Worshipful Company of Plumbers are desirous of obtaining the co-operation of all members of the trade in promoting a proposed mass meeting of plumbers to consider this important subject.

**Australian Notes.**—We take the following from the columns of the *Australian Builder and Contractors' News*, under date of March 30:—**Victoria.**—The Council of the Australian Health Society has resolved to urge the Premier to include in the Amended Health Bill, which he has promised to introduce into Parliament at an early date, a clause providing that for the future no sale of land in subdivision for building purposes shall be allowed to take place until the plan of subdivision shall have been approved by some responsible sanitary authority, and that no dwelling-house be erected until the plans thereof shall have been similarly approved.

—The Minister of Water Supply has received from the borough of Hamilton, an application for a loan of £15,000, to be devoted to the improvement of the local water supply.—**New South Wales.**—St. Mary's Cathedral, Sydney, as the mother-church of the Australian colonies, is to receive from the Pope, in memorial of his jubilee, the gift of a handsome altar of Pyrenean marble. At a mass meeting of Sydney plasterers, held last Saturday, it was resolved that 11s. a day be the recognised standard of wages for competent journeyman plasterers, and that the masters have the option of paying inferior workmen lower rates, but that they must first prove that the men to be so paid are really inferior workers.—A deputation from the unemployed waited upon Sir Henry Parkes at the Colonial Secretary's office last week, and were informed that public works would shortly be started which would give employment to about 2,000 men.—The Mayor of Sydney and the Corporation officials last week inspected and condemned or ordered to be repaired a number of dilapidated buildings.—**Queensland.**—Lighting by electricity is extending in Brisbane, the latest application of the system being that at the Royal Hotel, Queen's-street.

The Government have under consideration the question of putting down bores in the Brisbane district, in accordance with the recommendation of the Government geologist, Mr. Jack. Nothing definite has yet been decided, but the Government have secured two allotments of land at the racecourse, one of the sites recommended by Mr. Jack as a spot where water is likely to be found.—**New Zealand.**—The Governor laid the foundation-stone of the New Zealand and South Seas Exhibition at Dunedin on the 20th inst.—**Western Australia.**—The Perth City Council has decided to ask the Government to borrow a sufficient sum to carry out a scheme of water supply for Perth, the Council guaranteeing the interest on the loan, with a sinking-fund for the repayment of the amount.

**Civil and Mechanical Engineers' Society.**—The annual dinner of this Society was held at the Holborn Restaurant on May 15. The President, Mr. R. E. Middleton, M.Inst.C.E., M.I.M.E., F.S.I., occupied the chair, and a large number of members and visitors were present, among whom were Prof. Unwin, Mr. W. W. Beaumont, M.I.C.E. (joint editor of the *Engineer*), Captain J. Watson, Mr. H. Chatfield Clarke, and Mr. G. B. Oughterson, M.I.M.E. The usual loyal toasts having been duly honoured, Mr. Howard Chatfield Clarke proposed "Success to the Civil and Mechanical Engineers' Society," coupled with the name of the President, who responded, and in the course of his remarks referred to the useful work which the Society had been able to do in the professions from which its members are drawn, to its friendly character, and to the assistance which it is able to afford both intellectually and materially to its younger members, and he exhorted his hearers to bear this valuable quality of the Society in mind, and to do their best to promote its interest. Other toasts followed, and a very successful and pleasant evening terminated with "Auld Lang Syne."

**Memorials of the Dead.**—The seventh annual meeting of the Society for Preserving Memorials of the Dead will be held at St. Luke's Girls' School, Church-street, Chelsea, near Chelsea Church, on Saturday, May 23, at 2.30 p.m., the Earl of Northesk, President of the Society, in the chair. At the conclusion of the meeting, the members of the Society, with their friends, will adjourn to St. Luke's Church, where they will be received by the Rev. R. H. Davies, the incumbent, and a paper will be read on the memorials and monuments in the church, by Mr. Randall Davies. The Society proposes to draft a Bill for the better preservation of monuments in churches and churchyards, and Lord Northesk has undertaken to introduce the Bill in the House of Lords.

**British Archaeological Association.**—At the meeting on Wednesday, May 15, Mr. Thos. Morgan, F.S.A., in the chair, it was announced that a special meeting would be held on the 22nd to welcome the members of the Cambrian Archaeological Association, who will then be paying a visit to London. Several curious articles of Etruscan ware were exhibited by Mr. Geo. R. Wright, F.S.A., and Mr. Roope. Mr. Loftus Brock, F.S.A., described a figure of terra-cotta, apparently Mars, which was recently found near the Roman Camp in the valley of Christchurch, now the property of the Mayor of that town. Mr. Oliver exhibited rubbings of brasses from churches in Kent and Sussex, and Mr. Pritchett contributed sketches of another sepulchral monument, namely, of the Clarendon Tomb in Croft Church, Darlington. A paper was then read by the Chairman on "Certain Phases of the History of Early Christianity in England," the progress of the faith being traced from its early beginnings until the period of the Battle of Brunanburgh, reference being made to the evidences, now becoming numerous, derived from the early crosses and incised slabs. The opinions of various writers relative to the site of the battle were discussed, and the weight of evidence was shown to be in favour of a site in the North of England rather than elsewhere. A long discussion followed the reading of the paper, in which Messrs. Romilly Allen, Brock, Birch, and others took part. Drawings were exhibited, made by Mr. Matthew Jones, City Surveyor of Chester, which showed the most recent discoveries made in the Roman wall of that city. Excavations have been carried along a fresh length of the north wall, which had proved that the ancient base is of large un-mortared masonry, just a plinth, precisely similar to what has been found elsewhere. The Mediaeval wall, which is above the earlier base elsewhere, is not altogether so true, since, while the latter is straight in plan the former is somewhat irregular. The base is, therefore, in places below the wall, in others in front of it, greatly dilapidated. Its position shows beyond question that the base could never have been inserted at a later period below the Mediaeval portion as stated when it was met with elsewhere. Mr. Romilly Allen, F.S.A. (Scot.) called attention to the dilapidated condition of the Roman columns from Reculver Church, now in the garden at Canterbury Cathedral. They need to be protected from the weather, and the fallen ones re-erected.

**Railway Bridge over the St. Lawrence.**

The construction of a cantilever bridge of gigantic dimensions across the St. Lawrence at Quebec has been resolved upon. It is to connect the Intercolonial Railway, from Halifax and St. John to Quebec, with the Canadian Pacific Railway, and will supply the last link necessary to give the Canadian Pacific an uninterrupted line from the Atlantic to the Pacific Ocean through Canadian territory. The width of the St. Lawrence from shore to shore at Quebec is about 4½ miles, and the total length of the bridge, with approaches, will be nearly 6½ miles. Two main piers are to be constructed of solid granite in 40 ft. of water, about 500 ft. from each shore. These two piers are to support a cantilever of a span of 1,442 ft. The tops of the bridge from high-water mark will be 408 ft.

**The Hamburg Exhibition.**—The great Industrial Exhibition, which has been in preparation since 1887, will be opened in Hamburg shortly, and will remain open all the summer. It is situated on an excellent site near the Botanical and Zoological Gardens, its area being 16,000 square feet. The guarantee fund amounts to 500,000 marks, and the prizes to 50,000 marks. The demand for space has been so great that as long ago as November no further entries could be made. In connexion with the Industrial Exhibition there is also an exhibition of paintings by Hamburg artists. A commercial exhibition will also take place, demonstrating the important rôle played by Hamburg commerce in relation to the industries of the city.

**Cremation in Germany.**—The authorities of the City of Berlin appear to be more bigoted on this subject than those of any other city in Europe, the Cremation Society of the German capital having been refused permission to erect a crematorium. In consequence, the Minister of the Interior has been appealed to.—The Cremation Society of Hamburg has obtained a free grant of land from the city, near the Central Cemetery, for their crematorium. The necessary funds having also been contributed, building operations are to be begun forthwith.



**East of Scotland Engineering Association.**—The first excursion of the members of this Association for the season took place on Saturday afternoon last, when, by permission of Messrs. Tancred, Arrol, & Co., the Forth Bridge works were visited. The party numbered upwards of thirty, and were under the leadership of Mr. J. B. Bennett, A.M. Inst. C.E., the President, and Mr. W. Fairley, C.E., the Secretary of the Association. In the workshops, where signs were apparent that this great structure is approaching completion, the chief objects of interest were the girders which are to connect the ends of the cantilevers, the top and bottom booms of which are being prepared for erection. Special attention was given to the very ingenious arrangements for attaching these girders to the ends of the cantilevers, allowing free play for expansion and contraction due to changes of temperature. On the bridge itself the approach viaducts are almost complete, and on the south side a space of only 50 or 60 ft. now intervenes between the approach and the cantilever, and this is expected to be filled up before the end of next month, thus connecting the south cantilever with the shore.

**The Home Arts and Industries Association.**—The annual exhibition of work done in the classes of the Home Arts and Industries Association, including wood carving, repoussé and metal work, bent iron, embossed leather, mosaic, pottery, baskets, rugs, embroidery, lace, handspun linen, rabbit wool, cloth, &c., will be held at the studios, Royal Albert Hall, from the 3rd to the 8th of June.

### PRICES CURRENT OF MATERIALS.

| TIMBER.                                        |           | £  | s. | d. | £  | s. | d. |
|------------------------------------------------|-----------|----|----|----|----|----|----|
| Greenheart, B.G.                               | ton       | 6  | 10 | 0  | 7  | 10 | 0  |
| Task, E.I.                                     | ton       | 11 | 0  | 0  | 15 | 0  | 0  |
| Sequoia, U.S.                                  | foot cube | 0  | 2  | 3  | 0  | 3  | 0  |
| Ash, Canada                                    | ton       | 3  | 10 | 0  | 6  | 0  | 0  |
| Birch                                          | ton       | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm                                            | ton       | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantzig, &c.                              | ton       | 2  | 0  | 0  | 3  | 10 | 0  |
| Canada                                         | ton       | 2  | 10 | 0  | 4  | 10 | 0  |
| Fine, Canada red                               | ton       | 3  | 5  | 0  | 4  | 0  | 0  |
| Yellow                                         | ton       | 3  | 10 | 0  | 5  | 10 | 0  |
| Lath, Dantzig                                  | fathom    | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg                                 | ton       | 5  | 0  | 0  | 6  | 10 | 0  |
| Waincoat, Riga, &c.                            | log       | 2  | 15 | 0  | 4  | 5  | 0  |
| Odessa, crown                                  | ton       | 0  | 0  | 0  | 0  | 0  | 0  |
| Deals, Finland, 2nd and 1st, std. 100          | ton       | 0  | 10 | 0  | 11 | 0  | 0  |
| Riga                                           | ton       | 7  | 10 | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow                     | ton       | 11 | 0  | 0  | 15 | 0  | 0  |
| 2nd                                            | ton       | 10 | 0  | 0  | 11 | 0  | 0  |
| White                                          | ton       | 7  | 10 | 0  | 10 | 10 | 0  |
| Swedish                                        | ton       | 9  | 0  | 0  | 16 | 0  | 0  |
| White Sea                                      | ton       | 9  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                              | ton       | 15 | 0  | 0  | 20 | 10 | 0  |
| 2nd                                            | ton       | 11 | 0  | 0  | 17 | 10 | 0  |
| 3rd                                            | ton       | 8  | 0  | 0  | 10 | 10 | 0  |
| Spruce, 1st                                    | ton       | 9  | 10 | 0  | 11 | 0  | 0  |
| 3rd and 4th                                    | ton       | 7  | 10 | 0  | 9  | 0  | 0  |
| New Brunswick, &c.                             | ton       | 6  | 15 | 0  | 8  | 15 | 0  |
| Battens, all kinds                             | ton       | 6  | 10 | 0  | 20 | 0  | 0  |
| Flooring boards, sq. ft. 1 in. prepared, first | ton       | 0  | 11 | 0  | 0  | 14 | 6  |
| Second                                         | ton       | 0  | 8  | 0  | 0  | 10 | 9  |
| Other qualities                                | ton       | 0  | 5  | 6  | 0  | 7  | 9  |
| Cedar, Cuba                                    | ton       | 0  | 0  | 0  | 0  | 44 | 0  |
| Honduras, &c.                                  | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| Mahogany, Cuba                                 | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| St. Domingo, cargo average                     | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| Mexican                                        | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| Tobacco                                        | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| Honduras                                       | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| Box, Turkey                                    | ton       | 4  | 0  | 0  | 12 | 0  | 0  |
| Rose, Rio                                      | ton       | 15 | 0  | 0  | 20 | 0  | 0  |
| Balis                                          | ton       | 14 | 0  | 0  | 18 | 0  | 0  |
| Satin, St. Domingo                             | ton       | 0  | 0  | 0  | 0  | 1  | 0  |
| Porto Rico                                     | ton       | 0  | 0  | 0  | 0  | 1  | 3  |
| Walnut, Italian                                | ton       | 0  | 0  | 44 | 0  | 0  | 44 |
| METALS.                                        |           |    |    |    |    |    |    |
| Iron—Bar, Welsh, in London                     | ton       | 5  | 5  | 0  | 5  | 10 | 0  |
| " " at works in Wales                          | ton       | 4  | 15 | 0  | 5  | 0  | 0  |
| " " Staffordshire, in London                   | ton       | 5  | 10 | 0  | 6  | 10 | 0  |
| Copper                                         | ton       | 43 | 0  | 0  | 44 | 0  | 0  |
| British, cake and ingot                        | ton       | 43 | 0  | 0  | 44 | 0  | 0  |
| Best selected                                  | ton       | 44 | 0  | 0  | 45 | 0  | 0  |
| Sheets, strong                                 | ton       | 50 | 0  | 0  | 0  | 0  | 0  |
| Australian                                     | ton       | 49 | 0  | 0  | 0  | 0  | 0  |
| Chili, bars                                    | ton       | 89 | 10 | 0  | 0  | 0  | 0  |
| Yellow Metal                                   | ton       | 0  | 0  | 5  | 0  | 0  | 54 |
| Lead—Sheet, English                            | ton       | 13 | 10 | 0  | 14 | 0  | 0  |
| Strips                                         | ton       | 18 | 2  | 0  | 0  | 0  | 0  |
| Silesian, special                              | ton       | 18 | 2  | 0  | 0  | 0  | 0  |
| Ordinary brands                                | ton       | 18 | 0  | 0  | 0  | 0  | 0  |
| Tin                                            | ton       | 92 | 0  | 0  | 0  | 0  | 0  |
| Australian                                     | ton       | 92 | 0  | 0  | 0  | 0  | 0  |
| English Ingots                                 | ton       | 95 | 0  | 0  | 0  | 0  | 0  |
| Zinc—English sheet                             | ton       | 21 | 0  | 0  | 22 | 0  | 0  |
| OILS.                                          |           |    |    |    |    |    |    |
| Lined                                          | ton       | 19 | 5  | 0  | 19 | 12 | 8  |
| Coccolaut, Cochiti                             | ton       | 27 | 0  | 0  | 23 | 0  | 0  |
| Ceylon                                         | ton       | 24 | 15 | 0  | 25 | 0  | 0  |
| Palm, Lagos                                    | ton       | 23 | 10 | 0  | 0  | 0  | 0  |
| Rapeseed, English pale                         | ton       | 28 | 0  | 0  | 28 | 5  | 0  |
| " brown                                        | ton       | 28 | 10 | 0  | 0  | 0  | 0  |
| Cottonseed, refined                            | ton       | 24 | 10 | 0  | 25 | 10 | 0  |
| Tallow and Oleine                              | ton       | 19 | 0  | 0  | 4  | 0  | 0  |
| Lubricating, U.S.                              | ton       | 5  | 0  | 0  | 6  | 0  | 0  |
| " refined                                      | ton       | 7  | 0  | 0  | 12 | 0  | 0  |
| Tar—Stockholm                                  | barrel    | 1  | 2  | 9  | 1  | 3  | 0  |
| Archangel                                      | barrel    | 0  | 15 | 6  | 0  | 0  | 0  |

## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

### CONTRACTS.

| Nature of Work, or Materials.                | By whom Required.                  | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------------|------------------------------------|-----------------------------------|--------------------------|-------|
| Kerbing, Tarpaving, &c.                      | Lewisham Bd. of Works              | Official                          | May 28th                 | ii.   |
| Yarnouth Shingle Concrete Paving             | Hawell Local Board                 | E. J. W. Herbert                  | May 28th                 | ii.   |
| Shuttered Seats, Horse Bay                   | The Committee                      | do.                               | May 30th                 | x.    |
| Piggery, Boiling House, &c., Plumstead       | R. A. Co-operative Soc.            | J. O. Cook                        | do.                      | 31st  |
| Load Gutting                                 | Kent Asylum, Maidstone             | W. C. & A. S. Manning             | June 1st                 | x.    |
| Temporary Woods Stand, Newmarket             | Met. Asylums Board                 | A. & C. Harston                   | June 3rd                 | ii.   |
| Fire Escapes, Staircases, &c., Darent Asylum | Horseley Local Board               | T. de Courcy Meade                | do.                      | x.    |
| 10-ton Steam Road Roller                     | Stewards Jockey Club               | C. Toner                          | do.                      | ii.   |
| Extension of Sewer Outfall                   | Barbington Imp. Com.               | Samuel Mather                     | do.                      | x.    |
| Brick Sewer at Kingston-on-Thames            | G. W. R. Co.                       | Official                          | June 4th                 | x.    |
| Reconstruction of Riverford Viaduct, &c.     | Southend Local Board               | P. Dodd                           | do.                      | x.    |
| Making Good Alexandra-road                   | Stewards Jockey Club               | J. E. Worrell                     | do.                      | ii.   |
| Sewage Filters                               | Hastings R.S.A.                    | Jeffery & Skiller                 | June 5th                 | ii.   |
| Pipe Sewers, &c.                             | Pontefract Corporation             | G. Hodson                         | June 6th                 | ii.   |
| Works of Water Supply                        | St. Matthew (Bethnal Green) Vestry | F. W. Barratt                     | do.                      | x.    |
| Broken Granite                               | Bromley R.S.A.                     | Official                          | do.                      | x.    |
| Sawing, Dusting, and Waterlog                | Comm. of H.M. Works                | do.                               | do.                      | x.    |
| Making-up Private Streets                    | do.                                | do.                               | June 7th                 | ii.   |
| Postal Sorting Office, Leyton                | do.                                | do.                               | June 12th                | x.    |
| New Post Office, Bilton                      | Greenwich Bd. of Wks               | do.                               | do.                      | x.    |
| Concrete Embankment Walls, &c.               | School Bld. for London             | do.                               | Not stated.              | x.    |
| Erection and Enlargement of Schools          | War Department                     | do.                               | do.                      | ii.   |
| Painting Barnacks, Aldershot                 | do.                                | do.                               | do.                      | x.    |
| Painting, Whitewashing, &c., Plymouth        | do.                                | do.                               | do.                      | x.    |

### PUBLIC APPOINTMENTS.

| Nature of Appointment.       | By whom Advertised.               | Salary.          | Applications to be in. | Page. |
|------------------------------|-----------------------------------|------------------|------------------------|-------|
| Clerk of the Works           | Poplar Union                      | 4l. 4s. per week | May 27th               | xvi.  |
| Road Foreman                 | Kington - on - Thames Corporation | 2l. 2s. weekly   | May 29th               | xvi.  |
| County Surveyor              | Salebury County Council           | 450l.            | June 1st               | xvi.  |
| Surveyor                     | Horwich Local Board               | 178l.            | June 3rd               | xvi.  |
| Surveyor                     | Aldershot Local Board             | Not stated       | June 4th               | xvi.  |
| Draughtsman in Patent Office | Civil Service Com.                | do.              | June 5th               | xvi.  |

### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursday.]

**ACTON.**—For making, sewerage, channelling, and kerbing a new road at Acton, to be called Goldsmith-road. Mr. Edward Monson, jun., surveyor, Acton. J. Pizzev Horsey (accepted). £255 0 0

**ASHTED (Surrey).**—For the erection of a detached residence at Ashted, Surrey, for Mr. H. Furze. Mr. St. Pierre Harris, architect, &c., 1, Basinghall-street, London. £1,650 0 0

**BRISTOL.**—For new Wesleyan Chapel, Westbury-on-Trym. Mr. Herbert J. Jones, architect, Bristol. £2,911 0 0

**BRISTOL.**—For alterations and sanitary works at Chastford House, Clifton Downs, for Mr. W. Howell Davies, Mr. Herbert J. Jones, architect, Bristol. £759 0 0

**BRISTOL.**—For alterations to schoolroom, Wesley Chapel, Baptist Mills. Mr. Herbert J. Jones, architect, Bristol. £197 0 0

**BRISTOL.**—For works at Puckchurch Church, Bristol. Mr. John D. Bedding, architect, 447, Oxford-street. £1,312 0 0

**EASTBOURNE.**—For erecting All Saints' Conventual Hospital for Children, Eastbourne. Mr. A. Marston Mowbray, architect, Oxford. Quantities by Messrs. Henry Cooper & Sons, surveyors, Maidenhead and Reading. £211,405 0 0

**EASTBOURNE.**—For alterations to schoolroom, Wesley Chapel, Baptist Mills. Mr. Herbert J. Jones, architect, Bristol. £197 0 0

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**CHESHAM.**—For erecting schools at White Hill, Chesham, for the Chesham School Board. Mr. W. H. Syme, architect, Watford and Chesham. £5,080 0 0

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**LONDON.**—For work at hotel at South-street and South-place, Finsbury, E.C., for Messrs. J. & A. A. Armfield. Mr. W. M. Yett, architect, 44, Finsbury-place, E.C. Quantities by Messrs. B. L. Curtis & Son, London-wall, E.C.

|                                |             |
|--------------------------------|-------------|
| Asby & Horner.....             | 242,000 0 0 |
| Mowlem & Co.....               | 41,240 0 0  |
| Colls & Son.....               | 41,000 0 0  |
| Woodward & Co.....             | 40,370 0 0  |
| Higgs & Hill.....              | 40,700 0 0  |
| Asby Brothers.....             | 40,840 0 0  |
| Atkinson & Son.....            | 40,530 0 0  |
| Patman & Fotheringham.....     | 39,877 0 0  |
| Hobbs & Co., Limited.....      | 39,700 0 0  |
| Nightingale.....               | 38,080 0 0  |
| Rider & Son.....               | 38,080 0 0  |
| Brass.....                     | 38,753 0 0  |
| W. Downs.....                  | 38,416 0 0  |
| Felo.....                      | 37,987 0 0  |
| Jerrard.....                   | 37,880 0 0  |
| Bywaters.....                  | 37,780 0 0  |
| Lawrence.....                  | 37,700 0 0  |
| Marter.....                    | 36,573 0 0  |
| Garlick & Horton, Limited..... | 36,500 0 0  |

**LONDON.**—For the erection of new building at junction of Arden-street East with Lower Thames-street, for the Corporation of the City of London, Mr. Alexander Peebles, architect; Mr. W. E. Stoner and Messrs. Franklin & Andrews, surveyors:—

|                          |             |
|--------------------------|-------------|
| Cubitt.....              | 218,133 0 0 |
| Holland & Hannen.....    | 17,817 0 0  |
| Lawrance & Sons.....     | 17,100 0 0  |
| Morter.....              | 16,800 0 0  |
| Peto.....                | 16,272 0 0  |
| Clarke & Bracey.....     | 16,149 0 0  |
| Hall, Biddall, & Co..... | 16,137 0 0  |
| Doyle.....               | 16,100 0 0  |
| Mark Gentry.....         | 16,080 0 0  |
| Asby & Horner.....       | 15,840 0 0  |
| Nightingale.....         | 15,800 0 0  |
| Chappell.....            | 15,400 0 0  |
| Colls & Sons.....        | 15,325 0 0  |
| Mowlem & Co.....         | 15,120 0 0  |

**LONDON.**—For erecting a new warehouse at the corner of Worship-street and Paul-street, Finsbury. Mr. Edward Street, architect:—

|                      |            |
|----------------------|------------|
| Dove Bros.....       | 24,475 0 0 |
| Jno. A. Lyster.....  | 4,405 0 0  |
| Nightingale.....     | 4,271 0 0  |
| W. Lister.....       | 4,245 0 0  |
| W. Downs.....        | 4,190 0 0  |
| Kilby & Gayford..... | 4,134 0 0  |

**LONDON.**—For the erection of new warehouse, stabling, and dwellings, at Church-street, Fulham, for Messrs. Carter Paterson & Co., Limited, under the superintendence of William Fre, F.S.I., 10, Union-court, Old Broad-street, E.C.:—

|                                                            |            |
|------------------------------------------------------------|------------|
| Adamson & Son.....                                         | 23,495 0 0 |
| Dalbly.....                                                | 6,397 0 0  |
| Holland.....                                               | 6,384 0 0  |
| Chappell.....                                              | 6,218 0 0  |
| Godfrey & Son.....                                         | 6,185 0 0  |
| Burnard.....                                               | 6,040 0 0  |
| Chessum & Sons.....                                        | 6,028 0 0  |
| Downs.....                                                 | 5,950 0 0  |
| Clarke & Wardrop.....                                      | 5,915 0 0  |
| Higgs, F. H. F.....                                        | 5,965 0 0  |
| Johnson, J. H., St. Ann's Wharf, Limehouse (accepted)..... | 5,858 0 0  |
| [Holliday & Greenwood (too late).]                         |            |

**LONDON.**—For additional stabling, &c., at 14, Castle-street, Finsbury, E.C., for Messrs. McNamara & Co., Mr. J. T. Lamban, surveyor. Quantities by Mr. A. J. Bolton:—

|                           |            |
|---------------------------|------------|
| Knight.....               | 23,450 0 0 |
| Barrett & Power.....      | 3,438 0 0  |
| Stanger.....              | 3,160 0 0  |
| Garrud.....               | 3,147 0 0  |
| Toms.....                 | 3,119 0 0  |
| Hunt.....                 | 3,050 0 0  |
| G. Parker (accepted)..... | 3,043 0 0  |

**LONDON.**—For new building, Orange-street, South-west, for the Southwark Foundry Company, Limited, adjoining and in connection with Messrs. Hayward Brothers & Eckstein's premises. Messrs. Ford & Hesketh, architects:—

|                                |            |
|--------------------------------|------------|
| Oldrey & Co.....               | 22,582 0 0 |
| Rider & Son.....               | 2,948 0 0  |
| J. Morter.....                 | 2,882 0 0  |
| W. Downs.....                  | 2,831 0 0  |
| Turtle & Appleton.....         | 2,770 0 0  |
| Stubbs.....                    | 2,730 0 0  |
| J. Holloway.....               | 2,688 0 0  |
| Lawrence & Son.....            | 2,674 0 0  |
| Holloway Bros. (accepted)..... | 2,527 0 0  |

**LONDON.**—For alterations, repairs, and fitting up new bar and shop front, &c., at the "Coach and Horses," Creek-street, Brompton, W.C., for the Cannon Brewery Co. Messrs. J. C. Reynolds, architect, 30, Chamberwell-green, S.E.:—

|                                   |            |
|-----------------------------------|------------|
| Drew & Cadman, Holborn.....       | 21,908 0 0 |
| Jackson & Todd, Hackney-road..... | 1,810 0 0  |
| J. Walker, Limehouse.....         | 1,728 0 0  |
| J. & Hy. Cocks, Mile End.....     | 1,597 0 0  |

**LONDON.**—For warming the Langford-road School on the low-pressure hot-water system, for the School Board for London. Mr. T. J. Bailey, architect:—

|                                         |          |
|-----------------------------------------|----------|
| H. C. Price, Lea, & Co.....             | 2727 0 0 |
| J. G. Wagstaff.....                     | 890 0 0  |
| C. P. Kinnel & Co.....                  | 670 0 0  |
| W. Jenkins & Son.....                   | 645 10 0 |
| Emley & Sons, Limited.....              | 620 0 0  |
| J. & F. May.....                        | 595 0 0  |
| E. H. J. Pearson.....                   | 589 0 0  |
| J. & C. Christie.....                   | 582 0 0  |
| Eagle Iron and Engineering Company..... | 525 0 0  |
| Hayward Bros. & Eckstein.....           | 520 0 0  |
| R. Crane.....                           | 500 0 0  |
| J. Green.....                           | 500 0 0  |
| W. J. Cannon.....                       | 488 0 0  |
| J. G. Wagstaff & Son, Limited.....      | 484 0 0  |
| Purcell & Nobbs.....                    | 439 0 0  |

\* Accepted by the Works Committee.

**LONDON.**—For warming the Brackenbury-road School, Hammer-smith, on the low-pressure hot-water system, for the School Board for London. Mr. T. J. Bailey, architect:—

|                                  |          |
|----------------------------------|----------|
| T. Wenner Smith, Gray, & Co..... | 2380 0 0 |
| C. P. Kinnel & Co.....           | 730 0 0  |
| R. H. & J. Pearson.....          | 760 0 0  |
| W. Jenkins & Son.....            | 746 10 0 |
| H. C. Price, Lea, & Co.....      | 735 0 0  |
| Emley & Sons, Lim.....           | 731 0 0  |
| Thomas & Taylor.....             | 718 12 8 |
| J. G. Wagstaff.....              | 715 0 0  |
| J. & F. May.....                 | 695 0 0  |
| J. & C. Christie.....            | 670 0 0  |
| Hayward Bros. & Eckstein.....    | 660 0 0  |
| J. Grundy.....                   | 640 0 0  |
| Jones & Aldwood.....             | 623 0 0  |
| Purcell & Nobbs.....             | 600 0 0  |
| R. Crane.....                    | 598 0 0  |
| T. Green & Son.....              | 595 0 0  |
| W. J. Cannon.....                | 590 0 0  |

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For providing new rooms for the teachers of all departments of the Ship-street School, Kingsland, and also cloak-rooms for the Boys' and Girls' departments, for the School Board for London. Mr. T. J. Bailey, architect:—

|                    |          |
|--------------------|----------|
| Simmonds Bros..... | 2803 0 0 |
| Norris & Luke..... | 674 0 0  |
| F. Carter.....     | 525 0 0  |

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For enclosing, levelling, draining, and tarping the additional land adjoining the Everington-street School, for the School Board for London. Mr. T. J. Bailey, architect:—

|                    |          |
|--------------------|----------|
| Simmonds Bros..... | 2495 0 0 |
|--------------------|----------|

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For addition to offices at Islington Work-house, for the Guardians of St. Mary's, Islington. Mr. W. Smith, architect:—

|                               |          |
|-------------------------------|----------|
| Limfold.....                  | 2345 0 0 |
| Mastook Bros.....             | 328 0 0  |
| Langham.....                  | 315 0 0  |
| Turner.....                   | 306 0 0  |
| MacFarlane Bros.....          | 298 0 0  |
| Stevens Bros.....             | 294 0 0  |
| Dearing & Son.....            | 290 0 0  |
| Larks & Son.....              | 274 0 0  |
| Clarke Bros.....              | 265 0 0  |
| Edmonds.....                  | 248 0 0  |
| Hall.....                     | 248 0 0  |
| Wilkinson Bros.....           | 247 0 0  |
| Low & Son.....                | 245 0 0  |
| Brown & Sweetland.....        | 230 0 0  |
| Ward & Lambie (accepted)..... | 227 0 0  |
| Beavis Bros.....              | 225 0 0  |
| Wicks.....                    | 223 0 0  |
| Baylis.....                   | 180 2 0  |

**LONDON.**—For taking up old and relaying new drains at the St. Marylebone Parochial Schools, Southall, for the Guardians of the Poor of the Parish of St. Marylebone. H. Saxton Snell & Son, architects, London:—

|                                |            |
|--------------------------------|------------|
| George Gaisford.....           | 21,989 0 0 |
| E. Rogers & Co.....            | 21,957 0 0 |
| Wall Bros.....                 | 1,855 0 0  |
| Stokes & Son.....              | 1,584 0 0  |
| G. Gibson.....                 | 1,640 0 0  |
| W. Brown.....                  | 1,393 0 0  |
| C. Killingback (accepted)..... | 1,350 0 0  |

**LONDON.**—For repairs and painting to be done to eleven houses in Anderson's-walk, Lambeth, for Mrs. Fancourt. Mr. Banister Fletcher, architect:—

|                                   |          |
|-----------------------------------|----------|
| B. E. Nightingale (accepted)..... | 2320 0 0 |
|-----------------------------------|----------|

**LONDON.**—For sanitary works and decorations at No. 47, Beaufort-gardens, S.W., for Mr. Jules Desme:—

|                                  |           |
|----------------------------------|-----------|
| J. Munson & Sons (accepted)..... | 2,119 0 0 |
|----------------------------------|-----------|

[No competition.]

**LONDON.**—For alterations and additions to 180, Great Titchfield-street, W., for Mr. W. Parlett:—

|                                  |          |
|----------------------------------|----------|
| J. Tinson & Sons (accepted)..... | 2285 0 0 |
|----------------------------------|----------|

**LONDON.**—For alterations to No. 27, St. Mary-at-Hill. Mr. C. G. Baker, architect, 5, Bloomsbury-square, W.C.:—

|                    |          |
|--------------------|----------|
| Hawtrej & Son..... | 2329 0 0 |
| Edwards.....       | 259 0 0  |
| Weeks.....         | 258 0 0  |
| Carter.....        | 247 0 0  |

**LONDON.**—For pulling down and rebuilding Nos. 416 and 418, Holloway-road, for Messrs. Flatau & Co. Mr. T. E. Knight, architect, 106, Cannon-street:—

|                        |            |
|------------------------|------------|
| Kirk & Randall.....    | 22,231 0 0 |
| Kettle.....            | 2,138 0 0  |
| C. Wall.....           | 2,120 0 0  |
| J. & J. Greenwood..... | 2,087 0 0  |
| Ward & Lambie.....     | 2,087 0 0  |

**LONDON.**—For pulling down and rebuilding the "Spread Eagle" public-house, Bloomsbury, for the Burton Brewery Co. Mr. T. S. Archer, architect, 2, Gresham-buildings:—

|                           |            |
|---------------------------|------------|
| Toms.....                 | 21,167 0 0 |
| Tussell.....              | 21,143 0 0 |
| Holliday & Greenwood..... | 1,110 0 0  |
| Ward & Lambie.....        | 1,102 0 0  |
| Jackson & Todd.....       | 1,049 0 0  |

**LONDON.**—For alterations to "The Castle" public-house, 157, Kentish Town-road, for Mr. Locke. Messrs. Farniss & Thorge, architects, 50, Kentish Town-road:—

|                    |            |
|--------------------|------------|
| Scrivenor.....     | 21,735 0 0 |
| Anley.....         | 1,728 0 0  |
| Toms.....          | 1,895 0 0  |
| Voller.....        | 1,881 0 0  |
| Gould & Brand..... | 1,666 0 0  |

**LONDON.**—For alterations to the "Railway Tavern" beer-house, Willis-street, Bromley-by-Bow, for Mr. E. Spicer. Mr. E. T. Clarke, architect:—

|                      |          |
|----------------------|----------|
| Walker.....          | 2498 0 0 |
| Spencer & Co.....    | 425 0 0  |
| Dowery.....          | 417 0 0  |
| James A. Taylor..... | 409 0 0  |

**LONDON.**—For stables, 6, Upper Thames-street. Messrs. Hudson, Son, & Booth, architects. Quantities by Mr. H. Lovgren, 26, Buldew-street, E.C.:—

|                             |            |
|-----------------------------|------------|
| Colls & Son.....            | 21,891 0 0 |
| Greenwood.....              | 1,646 0 0  |
| Stimpson & Co.....          | 1,559 0 0  |
| Laurence & Son.....         | 1,550 0 0  |
| Hall & Biddall.....         | 1,490 0 0  |
| Scrivenor & Co.....         | 1,488 0 0  |
| Rider & Son.....            | 1,478 0 0  |
| Nightingale (accepted)..... | 1,425 0 0  |

**LONDON.**—For alterations at 37 and 39, Stepney-green, E. Messrs. Davis & Emanuel, architects:—

|                                            |          |
|--------------------------------------------|----------|
| C. A. King, 48, Fenchurch-street.....      | 2173 0 0 |
| F. & F. J. Wood, 94, Cleveland-street..... | 169 0 0  |

**LONDON.**—For shop-fronts at "Tavistock" and "Russell" Chambers, Hart-street, Bloomsbury. Mr. W. Seckham Witherington, architect, 79, Mark-lane:—

|                            |          |
|----------------------------|----------|
| Patman & Fotheringham..... | 2437 0 0 |
| Lascelles & Co.....        | 459 0 0  |

**LONDON.**—For alterations and repairs to 288, High Holborn, for the Avarat Bread Company. Mr. G. Edrly, architect, 52, Cannon-street:—

|                    |          |
|--------------------|----------|
| Barrett.....       | 2460 0 0 |
| Green & Lea.....   | 445 0 0  |
| Ward & Lambie..... | 437 0 0  |
| Schiering.....     | 421 0 0  |
| C. Wall.....       | 389 0 0  |
| Stevens.....       | 299 0 0  |

**LONDON.**—For alterations and repairs to the "British Store" public-house, for Mr. Gremmer. Messrs. Saville & Martin, architect, 57, Strand:—

|                    |          |
|--------------------|----------|
| Years & Co.....    | 2384 0 0 |
| Burch.....         | 373 10 0 |
| Walker.....        | 298 0 0  |
| Ward & Lambie..... | 270 0 0  |
| C. Baits.....      | 247 0 0  |
| Spencer & Co.....  | 245 0 0  |

**LONDON.**—For new counter and bar fittings to the Café de l'Europe, Haymarket, for Mr. H. Clarke. Mr. Walter Graves, architect, Winchester House, E.C.:—

|                   |           |
|-------------------|-----------|
| F. Sage & Co..... | 2134 12 6 |
|-------------------|-----------|

**LONDON.**—For the erection of seven shops, North End-road, West Kensington, for Mr. E. J. Scriven:—

|                            |            |
|----------------------------|------------|
| Flew & Co. (accepted)..... | 25,900 0 0 |
|----------------------------|------------|

**MANSFIELD (Notes).**—For erecting four houses, Nottingham-road, Mansfield, for Mr. W. Shippam. Mr. E. Frank Vallance, architect, Mansfield:—

|                                         |          |
|-----------------------------------------|----------|
| W. A. Vallance, Mansfield.....          | 2895 0 0 |
| James Evans, of Sutton-in-Ashfield..... | 873 0 0  |
| Saml. Dudson, Mansfield (accepted)..... | 689 5 0  |

**MARPLE.**—For oak panelling in library at Marple, for Mr. G. H. Hill. Messrs. J. W. & R. F. Beaumont, architects, 1, St. James's-street, W.:—

|                                   |           |
|-----------------------------------|-----------|
| C. Hindley & Sons (accepted)..... | 2198 10 0 |
|-----------------------------------|-----------|

**NORMANTON.**—For erecting house, shop, warehouse, and stabling, High-street, Normanton. Mr. William Watson, architect, Wakefield:—

*Accepted Tenders.*

|                                                     |          |
|-----------------------------------------------------|----------|
| James Bramham (Excavating, Brick, and Stone).....   | 2264 0 0 |
| Pickles Bros. (Slatting).....                       | 37 0 0   |
| T. C. Tattersall (Plastering).....                  | 35 6 8   |
| Henry Gibson (Carpenter and Joiner).....            | 285 0 0  |
| Thos. Brooke (Plumbing, Glazing, and Ironwork)..... | 96 0 0   |
| George Powell (Painting).....                       | 14 18 0  |

**NORMANTON.**—For erecting three dwelling-houses, High-street, Normanton. Mr. William Watson, architect, Wakefield:—

*Accepted Tenders.*

|                                                     |          |
|-----------------------------------------------------|----------|
| James Bramham (Excavating, Brick, and Stone).....   | 2527 0 0 |
| Pickles Bros. (Slatting).....                       | 46 6 0   |
| Joseph Reynolds (Plastering).....                   | 59 19 0  |
| W. H. Hutchinson (Carpenter and Joiner).....        | 333 0 0  |
| Thos. Brooke (Plumbing, Glazing, and Ironwork)..... | 77 0 0   |
| Thos. Taylor (Painting).....                        | 16 10 0  |

**ORPINGTON.**—For the erection of shop, house, and stables at High-street, Orpington, for Mr. W. P. Taylor. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street:—

|                      |            |
|----------------------|------------|
| Johnson.....         | 21,979 0 0 |
| Olvey.....           | 1,854 0 0  |
| Holt.....            | 1,800 0 0  |
| Wood.....            | 1,772 0 0  |
| Knigh.....           | 1,760 0 0  |
| Somerford & Son..... | 1,736 0 0  |

\* Accepted subject to modification.

**ORPINGTON.**—For additions, alterations, and repairs to private residence near Orpington, Kent. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street:—

|                       |            |
|-----------------------|------------|
| Somerford & Son.....  | 21,175 0 0 |
| Knigh.....            | 829 0 0    |
| Holt.....             | 850 10 0   |
| Olvey (accepted)..... | 850 0 0    |

**PAIGNTON (Devon).**—For building a cottage hospital, Paignton, for Messrs. M. & W. Singer. Mr. George Soudon Bridgman, architect, Torquay:—

|                                     |             |
|-------------------------------------|-------------|
| H. Webber, Paignton (accepted)..... | 21,825 10 0 |
|-------------------------------------|-------------|

**PAIGNTON (Devon).**—For building a house, and offices adjoining, at Paignton, for Mr. George Soudon Bridgman, architect, Paignton:—

|                                 |             |
|---------------------------------|-------------|
| Marcus Bridgman (accepted)..... | 21,073 10 6 |
|---------------------------------|-------------|

**SOUTHWOLD.**—For the erection of water-tower and engine-house, the supplying and fixing of pumping machinery, and the supplying and laying of cast-iron water mains, for the Southwold Waterworks Company, Limited. Messrs. Urban Smith & Arthur Pain, C.E., joint engineers, Westminster:—  
 Shillite & Son, Bury St. Edmunds. £4,515 15 3  
 Geo. Gibson, Southall ..... 3,978 0 0  
 Alfred Coe, Ipswich ..... 3,824 11 0  
 A. J. Gould, Storey Stratford ..... 3,504 3 3  
 Geo. Bell, Tottenham ..... 3,741 0 0  
 Alfred Dodman, King's Lynn ..... 3,702 7 0  
 Frederick Dupont, Colchester \* ..... 3,646 0 0  
 \* Accepted.

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 G. L. Wilson & Co., Limited ..... 970 0 0  
 Wilson & Stickley ..... 960 0 0  
 Little & Senecal ..... 940 0 0  
 Percival Hart, Tottenham ..... 898 10 0

**TOTTENHAM.**—For altering drains and laying new sewers on the Stoneley estate, Tottenham, for Mr. H. C. Williams. Mr. J. H. Couchman, surveyor, High-road, Tottenham:—  
 G. L. Wilson & Co., Limited ..... £136 0 0  
 Percival Hart ..... 103 0 0

**WAKEFIELD.**—For erecting five houses and shop, Jacob's Well-road, Wakefield. Mr. William Watson, architect, Wakefield:—  
 E. A. Rivey (accepted for all work) ... £275 10 0

**WAKEFIELD.**—For erecting offices for the Gas Light Co., Wakefield. Mr. William Watson, architect, Wakefield:—

*Accepted Tenders.*  
 J. S. Rd., & W. Flower (Excavating, Brick, and Stone) ..... £1,072 0 0  
 C. F. Everett (Slating) ..... 65 10 0  
 Chas. Driver (Plastering) ..... 74 0 0  
 Chas. Squire (Carpenter and Joiner) ..... 410 0 0  
 Ed. Kirk (Plumbing, Glazing, and Ironwork) ..... 210 10 0  
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**WIMBLEDON.**—For alterations and repairs to Cecil House, Wimbledon-common. Mr. W. H. Hawes, surveyor, Wimbledon:—  
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*Cemetery Chapels, &c., Sutton.*—Messrs. Arthur M. Deacon & Co., of West Norwood, write to say that their tender, amounting to £3,671, for cemetery chapel, &c., for Sutton Local Board, was omitted from the list. We printed the list as we received it, so that the omission was not ours.

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D. W. W. (not likely you could do it under about 1,400., unless it were very "jerry" work. The book you allude to is rather out of date now, but its place has not been exactly filled).—E. B. R. (thanks).—A. E. P. (cannot advise. Perhaps the Secretary of the Institute of Builders could direct you).—J. H. (we have already given illustrations and a good deal of information about the ancient manor house referred to).—J. W. & Co. (shall have attention).—E. & G.—S. & H.—H. R. M. (list of tenders received too late. They shall appear next week).—C. H. A. (too late this week).—J. M. Norwich (thanks). All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline printing out books and giving addresses. *NOTE.*—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications beyond mere news items which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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# The Builder.

VOL. LVI. No. 2417.

SATURDAY, JUNE 1, 1889.

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### The Urban Tenant and His Landlord.



EAR by year, with the growth of our large cities, the discomfort, and what is worse, the actual loss and suffering inflicted on the occupants of badly-built and insanitary houses, are increasing. Various

legislative remedies have been proposed, some of which have been adopted and are in operation. Thus, local authorities have been formed throughout the country, specially charged with the duty of enforcing proper drainage and water-supply to all buildings, and proper construction of new ones,—the happily-defunct Board of Works, now superseded by the London County Council, and the several District Boards and Vestries, being entrusted with all such matters in the Metropolis.

These measures have been of incalculable benefit in preventing much of the grosser kind of jerry-building. By their provisions, and by the By-laws framed under their sanction, the bricks, mortar, walls, drains, water-supply, and general construction of all new houses can be and to a great extent are properly regulated, and it might be supposed that time and an efficient executive would soon bring relief from the evils we have mentioned. Yet, though we have had the Metropolitan Acts since 1855, and the Public Health Act, applying to all places outside London, since 1875, it is a matter of common observation and experience that urban householders in 1889 endure as much misery from entirely removable causes, and are as little able to obtain redress, as ever.

Now the policy hitherto pursued in our remedial measures has been to create some new public authority, or to extend the powers and duties of existing ones; in fact, to throw upon the State what might reasonably be called the duty of the individual,—the duty of seeing that the house he occupies is not injurious to the health of himself or family. This policy has been in great part forced on us by the peculiar nature of the landlord and tenant law in England. By it, the rights which a party to any similar contract possesses are denied to the tenant in a contract of lease, and the State, awakened to the magnitude of the resulting evils, has stepped in to his aid with these measures.

To show what these rights are, we take the

case of a tradesman selling an article for a particular use and purpose. He is, very naturally and properly, held to warrant that it is fit for that particular use and purpose.\* We might therefore expect that where a landlord sells the use and benefit of a house (for that is what a letting really is) for a specific purpose, *he*, like the tradesman, would be held to warrant that it was fit for that purpose. In other words, we might expect that the purchaser of the use of a house would have the same right to receive what he really pays for as the purchaser of any other article.

On the contrary, however, the law holds that a landlord letting a house as a dwelling-house does not thereby warrant that it is fit to dwell in. Thus it has been decided that where the owner of a house, knowing that it is in a ruinous condition and dangerous to occupy, manages to let it to a tenant unaware of its condition, who takes it for the purpose of living in it, no action will lie against him for the omission to inform the tenant of the fact, in the absence of express warranty or proof of actual deceit.† To add to the effect of this ruling, we have the case of *Chappell v. Gregory*,‡ where it was laid down that where there is no agreement on the subject, a person who takes a house must take it as it stands, and cannot call upon the landlord to put it into a condition even fit for living in.

Lest it be supposed that these decisions have lost any of their effect, we need only remind our readers of the case of *Butler v. Goundry*, tried last year. The plaintiff here became tenant of a dwelling-house in the Brompton-road, after making due inquiry and receiving verbal assurances as to the good condition of the drains. On occupying the house the family suffered from symptoms of typhoid-fever, and the smells became so bad that the sanitary inspector was called in. He discovered that the only drainage—if drainage it could be called—was through an open brick channel under the kitchen floor, which had no connexion with the sewer. The sewage consequently overflowed freely under the basement of the house,—a state of things not unlikely to lead to fatal results. The Vestry then compelled the tenant to lay down proper drains, and the landlord, sheltered under the decisions quoted, refused to refund the cost. The tenant taking the only course which seemed to offer a remedy for his grievance, brought an action against

the landlord for having misrepresented the state of the drains, and was non-suited on the ground that there was no actual fraud on the part of the landlord. The Divisional Court refused a new trial, and on the case being taken to the Court of Appeal, it held that although the statement of the defendant as to the condition of the drains was untrue, it was honestly made, and the appeal was dismissed.\* The unfortunate tenant was thus compelled by the law to put new drains in another man's property at his own cost, and was refused redress for what he had suffered through the landlord's misrepresentation, besides having to pay the costs of these expensive legal proceedings. The principle mentioned before † was simply reaffirmed, that nothing short of actual fraud or deceit on the part of the landlord or an express warranty can make him responsible.

Now the butcher who supplies us with unsound meat,—who even has it in his possession for the purposes of sale,—is punished with forfeiture of the meat, and fine or imprisonment. Why should the butcher be so treated if the property-owner, who supplies us with houses to live in which are just as dangerous to health, not only escapes all punishment, but can actually claim the assistance of the State in enforcing his demand for payment? Is it because any one can tell whether a house be wholesome or not when he takes it, but very few can tell whether beef is until it is eaten? The opposite is the case; so that we may well ask, Why this anomaly?

It has become the custom to rail at the jerry-builder; nor have we a word to say in his defence. But it is evident that the want of trustworthiness, integrity, and fair-dealing on his part, of which we justly complain, has been largely encouraged by the freedom from responsibility which the landlord has secured for himself, and under which he can take shelter. Such immunity is the more to be regretted, as the restraint which the importance of his own credit places on the shop-keeper or trader is not much felt by the owner of house property.

An attempt to remedy these things was made by certain Acts‡ which gave to local authorities power to require the owner of insanitary premises to alter and amend them under certain penalties in case of failure. But the occupant is made equally liable with the owner, and it would seem from the cases

\* *Jones v. Bright*, 5 Bingham, 533. *Brown v. Edgington*, 2 Man & Grafton, 280.

† *Keates v. Earl of Cadogan*, 20 L. J. C. P., 76.

‡ 34 Beav., 260.

\* 4 T.L.R., 711.

† *Keates v. Earl of Cadogan*.

‡ *Metropolitan Building Act, 1865; Metropolitan Local Management Act, 1865; Public Health Act, 1875, &c.*



cited that the landlord generally comes off best.

An important step in the right direction was made by an Act of 1885,\* which provides that in letting houses for the working classes there shall be implied a condition that the house is at the commencement of the term in all respects reasonably fit for habitation. Houses for the working classes are defined as those of which the rental is under 4*l.* in Ireland, and under a certain limit of Poor Law Assessment in England, so that the benefit of this wise and eminently just provision is limited.

Of course, it may be said that any one may protect himself by becoming his own landlord, or by insisting on express safeguards in the agreement. But the largest class of respectable householders,—small tradesmen, clerks, mechanics, and others on yearly or three-yearly tenancies,—are too poor to buy or build, and could no more obtain a written warranty from their landlords than a written warranty from their baker with every loaf they buy. Nor should it be any more necessary for them than for those who are arbitrarily described as "the working classes."

From some nice ethical distinction not apparent to the lay mind, our lawyers have decided that persons letting furnished rooms or furnished houses must warrant that they are fit for occupation.† Unfortunately, we have no authoritative definition of what constitutes "furnishing," so we cannot tell whether this moral and legal responsibility slowly grows upon the landlord from the advent of the unassuming kitchen table to the completion of the household plenishing by the handsome drawing-room suite in blue repp, or whether a particular degree of furnishing is required to effect such a change. It is patent, however, that the class who let lodgings have not legislated for themselves as the class who let or lease houses.

It will be a matter of surprise to some to find that there is a very different law of landlord and tenant in Scotland. There the ordinary principles of justice which govern the contract of sale are applied to the contract of lease. Thus a landlord is not only bound to deliver the premises in a habitable condition, and (in the absence of express agreement to the contrary) to maintain them so during the currency of the letting, but is also liable for the cost of any necessary repairs executed by the tenant, and in damages for injury suffered by his neglect.‡ The effect of this is shown by a recent case where a tenant had complained to his landlord of bad smells, and made application to have the drains tested. This was not properly done; several of the family became ill, and one little boy died. The drains being proved to be in a defective condition, Sheriff Lewis awarded 160*l.* compensation to the tenant.§

On contrasting this with the result in *Butler v. Goundry*, it is clear that there is a defect in the administration of justice either in the north or the south of this island.

Nor is an action for damages the only remedy of a Scottish tenant. On the equitable and politic principle that no one should be compelled to remain in a house where there is danger to health, or where a nuisance exists which is not readily or easily removable,|| the tenant is there entitled to throw up the lease as well. Further (we quote Sheriff Spens), "where a landlord lets premises for a distinct and specified purpose, he must be held to warrant that they are sufficient for that purpose; at all events that they will not be insufficient owing to such a cause as damp"; so that a tenant taking premises for a provision shop, and finding the dampness such as to make it impossible to carry on business at a profit, was held entitled to renounce the agreement.¶

\* Housing of the Working Classes Act, 1885, section 12.  
† *Wilson v. Finch-Hatton*, 16 L.J. C.L.D., 489; Smith v. Marable, 11 M. and W., 6, &c.

‡ *Erskine's Institutes*, II., 6, 41.  
§ *Ferguson v. Goundry*, 3 "Scottish Law Review," 255.  
|| *Cuthbert on Trustees v. Turner*, 3 "Scottish Law Review," 449.

¶ *Cathcart Railway Company v. McLachlan*, 13 "Scottish Law Review," 220.

In brief, there is in Scotland no invidious distinction drawn between the lessors of furnished and unfurnished houses: no special exemption from responsibility given to one class. Redress for a breach of contract on the part of a landlord,—such as where the tenant has not got what was expressly contracted for or what was implied, where one room of a house, say, is uninhabitable,—is freely awarded under ordinary principles of equity.

In many other ways the rights and wrongs of the parties to these agreements are reversed in the two countries. Thus, a person who takes premises in England which are afterwards burnt down must still pay the rent, though he does not get what he is paying for. Even if the landlord had agreed to insure against fire, the tenant could not compel him to rebuild, unless a special covenant to that effect had been entered into, though the rent would still have to be paid. He might, however, give notice to the insurance company not to pay the money to the owner, but to spend it in re-building,—a relief to which he became entitled under an Act of Geo. III. Yet even this "relief" does not save the tenant from having to pay rent during the rebuilding.

Of course, should the landlord agree to keep the premises in repair, he could be compelled to rebuild. But even then, the right to exact the rent, whatever happens, is asserted. For, where a landlord contracted to keep premises in good repair, which yet fell down in the ordinary course of usage, the tenant was required to pay the rent notwithstanding the fall.\*

But when we inquire what view is taken in Scotland by lawyers, not less capable than our own, of the very same questions, we find it clearly laid down that if the house should tumble down, or the tenant be debarred from possession, even without any rashness or omission on the part of the landlord, no rent is due for the time that it is uninhabitable.† This seems only fair, for if A contracts with B to supply him with certain goods for which B is to pay as the goods are received, it is only right that the payments should cease if the supply ceases. Nor can the fact that A supplies certain conveniences, such as a house to live in, or premises to trade in, affect the principle of equity involved. The contract between A and B is not that B creates an unconditional liability upon himself, but that the rent being paid as the consideration is received, it is essentially dependent upon the receipt of the consideration.

There can be little doubt that the difference in the law which we have shown to exist north of the Tweed operates powerfully in securing sound construction and in the maintenance of premises in habitable condition. In advocating, then, that our English law should be made to conform to that of Scotland, it is alike in the interests of sanitary reform, and with the desire to remove a genuine injustice to which every tenant of a town or suburban house is exposed. Such a measure should provide for these objects, in whatever more guarded and precise phraseology may be considered necessary to give it true legal efficiency:—

First.—That where premises are let for a distinct and specified purpose, the lessor shall be held to warrant that they are sufficient in structure and condition for such purpose (in the case of dwelling-houses that they are in habitable condition), and shall also, in the absence of express agreement to the contrary, maintain them so during the currency of the lease.

Second.—That should any repairs be necessary, as aforesaid, which the landlord fails on notice given to do, the tenant may make such repairs and deduct the cost from the rent.

Third.—That should the tenant suffer any injury or damage through the defective condition of the premises, the landlord shall compensate him for such injury or damage.

Fourth.—Where the tenant of any premises is debarred from possession by reason of such premises being burnt down, or falling down,

\* *Manchester Bonded Warehouse Co. v. Carr*, 5 C.P.D., 707.  
† *Erskine's Institutes*, II., 6, 43.

or becoming uninhabitable in whole or in part, through any neglect of duty on the part of the landlord, no rent shall be due for the premises, or for such part, as the case may be, until the building has been re-instated in its original and proper condition.

We do not advocate any new principle in this, the responsibility of the owner having been already recognised in the Acts mentioned. And we maintain that as each tenant might be trusted to defend his right, were it clearly established, such a measure would do more to rid us of the evils of bad and insanitary houses than doubling our present staff of Medical Officers of Health, District Surveyors, and other public functionaries.

## SCULPTURE AT THE ACADEMY AND THE SALON.

IT cannot be said that this is a very good year for sculpture at the Royal Academy. There is a good deal of commonplace, and the most powerful works in point of execution do not rise to that poetic meaning and interest which is the highest triumph of sculpture. Mr. Armstead's statue, for Chatham, of Lieutenant Waghorn, the pioneer of the overland route, which forms the central object facing the entrance, is spirited, and has a meaning in its action, but the costume is fatal to it. In the lecture-room the most important work is Mr. Harry Bates's group of "Hounds in Leash," a couple of tremendous dogs held back in the leash by a nude man whose struggle to hold them, planting his foot forward and throwing his whole weight back in a crouching position, is most forcibly expressed; he and the animals are finely grouped, and his outstretched arm, level with his face, above the backs of the dogs, has great energy of action, and binds the whole group together. The man's torso is also very finely modelled. Still, this is not sculpture with an intellectual idea in it; it is the kind of thing that would be put in the hall of a big country mansion as a centre-piece. Mr. Richmond's large figure of "The Arcadian Shepherd" is simply a figure of a man striding along with his crook held and half-bent behind his shoulders; it is a good figure of a man, but has no other interest and tells no story. Mr. Brock's "Genius of Poetry" is a very dyspeptic-looking genius. Mr. Birch has chosen for his subject the martyrdom of Margaret Wilson, who is said (for we believe the story is apocryphal) to have been tied to a stake and drowned by the incoming tide of the Solway. Mr. Birch treats the subject with some pathos; the woman, tied to a stake with her hands clasped round it in prayer, looks over her shoulder at the same time in terror at the approaching water; at least we take it that is the idea; but the whole thing is not sculpture, there is a ragged look and a want of composition in it, and the mass of hair looks unfortunate and rather sea-weedy. Mr. Gell's "An Idle Hour" is a pretty nude figure of a girl seated playing with a bird on her wrist; this is pleasing enough, but there is no distinction in it, nothing to place it above many other figures of the same kind. Mr. Onslow Ford has been very successful in his aims in the statuette called "The Singer," but the work is rather an *objet de luxe* than a work of pure sculpture; it consists of a bronze pillar and capital, with a pedestal thereon decorated with birds and snakes, &c., in an Egyptian manner and with a kind of imitation of the effect of *cloisonné*, on which is a thin lank nude figure of an Egyptian girl with what would be called on the stage a "practicable" harp. The whole thing is very complete, and would look admirable in the corner of some richly-furnished room à la Grecque, such as Mr. Tadema loves to paint. Sir J. E. Boehm's design for a fountain to be erected for the Duke of Bedford (where?) is a small-size highly-finished model with a very spirited group of a boy and mermaid in bronze on the top; below are two successive basins, the upper one upheld by monsters of most grotesque character in bronze, half hidden by



the marble of the basin, and their fishy extremities appearing again out of it below. The whole of this part of the design is sheer *rococo*, and looks bad enough on this small scale; what will it look on a large scale?

In the octagon hall we find replicas of two of the four supporting statues of the Wellington monument, "the Guardsman of 1818" and the "Enniskillen dragoon of 1818." These are admirable works of their kind, the dragoon especially, whose action is fine and characteristic, and his face a typical physiognomy of an old soldier. Mr. G. A. Lawson's "Motherless," of which we have given an illustration, and which is a life-size, realistic group of a working man seated and holding his little child in his arms, is one of the most successful works, perhaps the most successful work, of the year; the child's face is lovely, and without losing the simplicity of nature the artist has succeeded in composing the group so as to be thoroughly sculptural, in which light it may be usefully compared with Mr. Birch's "Margaret Wilson" aforesaid, which is simple without being sculptural. Mr. Lawson's group, as a treatment of a subject from humble life in sculpture, recalls some of the best qualities of Dalou. His other figure of the youth with his father's shield and helmet, "bequeathed by bleeding sire to son," does not interest us much, but is a well modelled figure of a youth with a good deal of expression both in countenance and action. Among the other works in the octagon is Mr. Whitehead's seated figure of "Stephenson meditating on the locomotive," which we venture to think Stephenson did not do with a clumsy toy locomotive on his knee,—that was not the way locomotives were invented; the figure, nude to the waist, is expressive in countenance, and the feet are admirably modelled; the torso and arms are not those of a man engaged in hard manual labour. Mr. Peplow's "L'escave et son Dieu," an emaciated nude figure of a man with fetters on his wrists, lifting his hands in appeal and with his face turned upward, has fine qualities both of sentiment and execution, and is a work above the common order. The same artist shows his talent in a very different subject, in the spirited bust portrait of "Miss Rachel Gurney," a work also above the ordinary run of respectable busts which line the walls as usual. Miss Halse's alto-relief, "The Call of St. John," part of the *redoros* for St. John's, Notting Hill, is a graceful figure, not suggesting anything apostolic. Mr. H. C. Christie has been exceedingly successful in his life-size figure of a lion roaring, entitled "A Note of Triumph"; the outstretched rather dog-like head (a lion's head is not nearly so rounded and cat-like as it is shown in popular pictures, though the mane gives that idea), and the open mouth rounded for a sonorous roar, are exceedingly true, and show very careful observation; but is the ankle-joint, or what answers to it, of the hind leg really so near the paw as represented here? It looks as if it were a little too near the foot for correct anatomical proportion.

Among works in the Lecture-room, of less size and prominence than those we have already mentioned, are Mr. Thornycroft's two bas-reliefs for a memorial to Gordon to be erected at Melbourne. The first, representing Gordon's death at Khartoum, (of the manner of which, of course, we know nothing), is rather feeble and spiritless in conception; that representing "Gordon teaching ragged boys at Gravesend" is fine, the noble simplicity in the figure and head of Gordon is well conveyed and quite in keeping with all we know of his character. Mr. Reynolds Stephens has made an interesting experiment in a long bronze decorative panel in very low relief adapted from Mr. Tadema's "Women of Amphis," the composition being reduced from perspective and spread out on a flat plane by a kind of artistic "Mercator's projection"; the style and attitudes of the figures, we need not say, lend themselves very well to sculptural treatment of this kind.

This is the second time one of Mr. Tadema's pictures has been translated into sculpture. Mr. Armstead exhibits one of those experiments in portrait modelling in very low relief which are becoming common,—a kind of pictorial sculpture, in a half-length portrait of "Miss Lottie Armstead"; there is a little too much detail of dress and bows of ribbon for the severe style proper to this kind of work. In the opposite position to this is a curious work by M. Vereker Hamilton, mystically entitled "Wind from the Spring Star," a nude figure of a woman in such very low relief as to be almost pictorial in treatment, apparently standing on some rocks with sculptural water breaking behind. Vague as it is, there is a certain poetry about this; the artist has not quite got over the difficulty of the feet foreshortened in slight relief; they seem hardly modelled at all. There is a remarkable life-size "medallion" (so-called), really a quarter-length figure in marble relief, with a square frame round it, by Mr. Thomas S. Lee; a side-face in which the ground is to a certain extent raised and worked up to the profile, which seems to die into it; the marble appears to have been tooled and then partially polished, giving it a look of great softness and a certain indistinct or veiled character: the lower part of the marble is tinged with iron stains, adding to the unusual effect of the whole. Mr. Woolner exhibits a medallion (in the usual sense) of "Sir Joseph Whitworth," balanced on the other side of the door by a highly-finished one of "Mrs. Craik" by Mr. Armstead, in a decorative setting, part of a memorial to be erected in Tewkesbury Abbey. Mr. Pinker exhibits a medallion portrait of "The late W. E. Forster" which is very unhappy in effect; the face, in bas-relief, is turned nearly facing, and in a circular medallion only just large enough, so that the late much-respected statesman appears as if looking out of a pillory. The world has discovered some time ago that profile is the treatment best suited for low relief within a circular medallion, and these modern experiments are not calculated to convince any one to the contrary. A fine very low relief study is that of a woman seated with her face buried in her hands, and entitled "Forsaken," a bronze bas-relief by Mr. Schäfer. The life-size alto-relief head of the late Rev. Benjamin Webb, by Mr. Armstead, is a fine dignified head within an alcove with a "shell" top, and surrounded by various ornaments and emblems, forming the central part of a monument of which the architectural details are to be designed by Mr. Pearson.

Among smaller things that are worth mention are a miniature edition of Mr. Thornycroft's "Teucer"; a little square relief called "Mother and Children," by Mr. Schenck; a repoussé iron plate, "illustrating the four elements, with the head of Jupiter in the centre," by Mr. A. Hubert, a capital bit of work; a clever "Study of a head" by Mr. W. Sadler; a study of a child in very low relief by Mr. John E. Taylerson; "L'éveillée," a figure of a very solid-looking young woman stretching herself on waking, by Mr. S. Fry; "True Love," a pretty group of two sisters, by Mr. Owen Hale; a small bronze of "a young Himalayan tiger," all fore-legs, by Mr. J. M. Swan; and a little bronze "Byblis," by Mr. Gustave Natrop.

The Salon contains no work in sculpture that can be pointed out as the master-work of the year, and generally the class of monumental sculpture leaves much to be desired. A marble bas-relief by M. Chapu, representing "L'Espérance" under the guise of a woman seated and grandly draped, and two decorative figures designed by M. Mercié for the tomb of Paul Baudry, are the only two works in this class that rise above mediocrity; and even here it must be confessed that M. Mercié has often had better inspirations. The "Douleur" in long sweeping robes, leaning disconsolately on the tomb, is a fine figure; but the "Gloire Ailée" which crowns the bust of the painter is awkward in pose

and certainly does not exhibit the calm serenity of expression that ought to characterise an apotheosis. The work of M. Chapu is, as usual, full of grace and expression.

At the two extremities of the nave of the Palais d'Industrie there rise, facing one another, two monuments of vast proportions; one (already referred to in connexion with the architectural exhibits), is to be erected to the memory of Mme. Boucicaut, and the sculptural portion is by M. Léon Perrey. The other, intended for Guatemala, consists of a group of allegorical statues, heavily composed, by M. Carrier Belleuse, who has not inherited the feeling for harmony of line and composition, and a certain arch gracefulness, which characterised the works of his father. The colossal "Vierge" by M. Cugnot, intended for the chapel of the Collège de Juilly, is more impressive from its size than from any higher quality.

As usual, there is a certain amount of official sculpture,—works commissioned by the City and the State. M. Allouard's "Comédie," intended for the Odéon, is a graceful conception, much to be preferred to the brood of young satyrs exhibited by the same sculptor. The "Université de France" of M. Allar, a statue in stone commissioned for the Sorbonne, is a figure open to much criticism in regard to the modelling and proportions of the arms. We find near this the bronze edition of the "Génie de la Musique," of which M. Bailly exhibited the plaster model in the Salon of 1887. This is a statue which will eventually find its place in some Parisian square, as well as the "Premier Frisson" of M. Bonfosse, a pretty work and much more attractive than his immense group entitled "Gloire à Paris."

"La Chasse" of M. Barrias is a beautiful figure in marble intended for the Salle des Banquets of the Hôtel de Ville, as well as the "Vendange" of M. Crank, a somewhat heavy figure in aspect and attitude. Among portrait-statues there are to be noted that of the painter Rigault by M. Farail, for the town of Perpignan, and the seated statue of Carnot by M. Tuscan, a work of very fine character. The "Raspail" of M. Morice, and the "Arago" by M. Olive, on the other hand, are very mediocre works, which will, however, probably both go to swell the number of public statues which Paris has already erected to her celebrities.

There is a reproduction in marble of M. Mathurin Moreau's fine group of the "Exilés," of which the plaster model was exhibited two years ago, and which is said to stand a good chance for the "Médaille d'Honneur," if the jury award it this year: it is a masterly work in conception and expression, and exhibiting great science in modelling.

The "Judith" which M. Aizelin exhibits, and his group in marble of "Agar and Ismael," are both fine works, and the "Musique" of M. Falguère might be praised unreservedly had not the sculptor made the mistake of preserving in his work the trivial "masque" of a well-known model. M. Ferrary exhibits a fine group in marble, the "Décollation de St. Jean Baptiste," the work of a young sculptor who is making great progress.

Among the allegorical sculpture may be mentioned a "Naïde," a piece of decorative sculpture by M. Peynot, intended for the Château de Vaux; the "Muse" of M. André Chenier; the "Death of Attila," a "groupe mouvementé" by M. Lanson; a pretty figure by M. Hector Lemaire, "Il Primo Amor," and a very delicately modelled marble figure by M. Damp, entitled "Volupté."

M. Fremiet, not unmindful of various criticisms that have been passed on his equestrian statue of "Jeanne d'Arc," which since 1873 has adorned the Place des Pyramides, has been desirous to modify his first idea. Whether the new version of the statue which he presents to us has gained by the alterations may be questioned. In endeavouring to make his heroines more feminine in character, he has gone to the other extreme, and has substituted for the former figure, which was judged to have too much the appearance

\*The other instance was in the case of the two figures in his "Springs," which Mr. Maclean produced as a life-size group in marble.



of a young man, a stout and robust matron who seems ill at ease in her armour. That there is a medium in the reading of the character M. Dubois has perceived; his "Jeanne d'Arc," a statue intended for Rheims, is completely feminine in character in the true sense, and both figure and horse are full of vigour, but why should he have spoiled the group by the awkward gesture of the hand which brandishes the sword, and gives to the statue such an ungainly outline? The decorative sentiment is much more true in the work of M. Fremiet, where the unfolded standard surrounds the figure with its folds, and gives breadth to the whole.

Among the sculpture of animals a fine Danish dog, in marble, by M. Gardet, is to be noticed, as well as the "Lionne blessée" of M. Valton and the model in plaster of a rhinoceros by M. Robert Stark.

Busts are very numerous at the Salon. That of M. André Theuriot is an admirable portrait bearing the signature "Dalou." M. Jean Baffier, ordinarily realistic even to ugliness, has imparted a real grace to his figure of the "Paysanne Berrichonne." M. Paul Dubois sends a splendid bust of the painter Bonnat. The portrait bust exhibited by M. Chapu, and the "Tête de Femme" of M. Barrias, are both masterpieces of execution. To these we may add the "Buste de Femme" by M. Guillaume, a terra-cotta head by M. Aubé, the portrait of Mlle. Rivolta by M. Antonin Carles, a marble bust by M. Cordonnier, and one of Corot, the landscape painter, commissioned from M. Béguine by the Ministère des Beaux-Arts.

As to the innumerable other statues which crowd the nave of the Palais de l'Industrie, and which, under various more or less pretentious titles, are really nothing but atelier studies, one may pass them over merely with an expression of regret that the jury of admission has been so indulgent to these productions, which do not add to the prestige of modern art, and seem placed here only to hide the too rare works of the masters of French sculpture.

#### NOTES.

**T**HE London County Council finds it necessary this week to again hold a second meeting, which has been arranged for Friday, May 31, at 4 p.m. At the meeting on Tuesday last the Council were unable to deal with the whole of the Reports of Committees, which have to be taken before the notices of motion can be proceeded with. The agenda for last Tuesday contained no fewer than thirty-eight notices of motion, some of them relating to matters of urgency, but with the exception of deleting one or two which were withdrawn by the movers, the paper was left practically untouched. Several of these notices of motion have been standing on the paper for weeks. If we might venture to give a hint to some of the more ardent spirits among the Council, we should invite them to be less eager to do everything at once, and less voluble in their speech about everything. Even under so admirable a Chairman as Lord Rosebery, whose tact is most marked, and with the salutary rule limiting the duration of speeches to ten minutes or a quarter of an hour, a great deal of time is wasted in "words, words, words." Perhaps some allowance must be made for the Council as a new body with new duties to perform; but it is certainly time that they settled down and grappled with their work in earnest. It is not creditable that, at meeting after meeting, only half or less than half the business on the paper is got through. Some of the notices of motion, it is true, are of an abstract and doctrinaire character, and are therefore rightly opposed. But why such a motion as that which has been upon the paper for some weeks in the name of Mr. Walter Wren should be opposed we are at a loss to understand. Mr. Wren proposes to move, when he can get the opportunity—

"That it be an instruction to the Sanitary and Special Purposes Committee to take into considera-

tion the causes of the fogs which trouble London during the winter months, and the increased death-rate during their prevalence, in order to put in force existing powers for dealing with them, and obtaining increased powers, if necessary."

What the eminent "coach" is obviously driving at is an inquiry not only as to the origin of London fogs, but as to the manner in which their ill-effects are augmented and aggravated by London smoke. Why there should be any objection to the Sanitary and Special Purposes Committee (who now have the aid of an able Medical Officer of Health) inquiring into this question we cannot see. Surely such an inquiry can do no harm, and it may perhaps result in good. And after the experience of the fogs of Monday last, and of some previous days in May, Mr. Wren will no doubt readily agree to amend the terms of his motion so that it may include the spring, summer, and autumn as well as "the winter months."

**T**HE discussion at the private meeting of the Institute on the 6th, of which a report appears in the last issued number of the R.I.B.A. Journal, on the question whether the words "and surveyor" should be added to the word "architect" in the proposed model form of articles of pupillage, is of some interest in regard to the various views expressed and the reasons for them. The insertion of the words was moved as an amendment, mainly on the grounds that the title "surveyor" is used in many legal documents as the official title of the technical advisers connected with large hospitals and cathedrals throughout the country, and that the advising architect of St. Paul's has been from the first in name the "surveyor." This latter argument, however, is of little point; it is merely a question of obsolete phraseology. The view taken by most of the opponents of the amendment was that the word "architect" included "surveyor" in every sense in which it was desirable that an architect should act as such. The amendment was carried by a majority of ten, sixty having voted; but a mysterious reference to the minutes, "page 257 ante," states that "the matter still stands as it did before the discussion above reported." Without professing to understand this arrangement, we hope it will stand so, as we are of opinion that the Council are in the right. The body concerned is the "Institute of Architects," not of "Architects and Surveyors," and the wording of the form of articles should surely follow that style.

**T**HE prize offered by the King of the Belgians for the best essay on the method of supplying water to Brussels and other cities in Belgium seems to have caused general inquiry into questions relating to water-supply in that country. Many towns and cities have at last come to the conclusion that the water they use for domestic purposes is not what it might be in regard either to quality or quantity, and they are therefore seeking the assistance of those whom they deem to be qualified to advise them on such subjects. As a result, various schemes for supplying certain towns have been brought forward by officials and private individuals. Some of these are merely revivals of proposals that have been before the Belgian public for years, whilst others are entirely new. It is interesting to note the manner in which these schemes are being considered. Belgian scientists recognise the fact that it is utterly impossible for any one class,—engineers, geologists, chemists, or biologists,—to speak with authority on all matters relating to water-supply, and they have wisely, within the last year, held meetings in concert with each other. The combined efforts, perhaps, of the Société Belge de Géologie and the Société Royale de Médecine Publique, have contributed more than anything else to bring about this result. Every large scheme seriously brought forward is undergoing a rigorous examination at these meetings and in private conferences, and already one can see the great utility of combined action. Here is a case in point. An ambitious project

for supplying Namur, Charleroi, Brussels, Tirlemont, Louvain, Mechlin, Lierre, and Antwerp with water has been propounded by MM. Leborgne and Pagnoul. They proposed to derive the supply from the rocks and high ground of a region in the vicinity of the Sambre and Meuse, and in the Condroz. At first sight, nearly everything seemed favourable to it, so far as it went. No real fault was found in regard to the engineering part of the scheme; the whole appeared to be quite practicable, and in a fair way of acceptance by the authorities. When it came before one of the recent scientific meetings referred to, however, and was examined by competent hydro-geologists, the whole scheme came to the ground. The remark of the President of the Société Belge de Géologie, that he found the project "trop peu étudié au point de vue géologique, et qu'il juge inexécutable les assertions des auteurs lorsqu'ils disent que les terrains qu'ils comptent drainer sont perméables à un haut degré," together with the observations of other geologists and meteorologists at the same meeting, were quite sufficient to dispose of the scheme as it stands. For our own part, we think that at least Antwerp might have been left out of the question, seeing that Messrs. Easton & Anderson have already given an excellent supply to that city. It is high time, however, that something was done for Namur. The supply to the other cities mentioned is anything but satisfactory; but the water of Namur, in part, is in a highly-polluted condition, and quite unfit for domestic purposes,—a state of things brought about by the construction of numerous canals, and particularly by the terrible inundations of 1880, which latter flooded the majority of the wells in the city. So far, the names of English engineers do not figure very prominently in connection with the various schemes projected. Why is this?

**L**AST week, before a Committee of the House of Lords, a Bill for a traffic tunnel under the channel of Glasgow Harbour, as a means of transverse communication between the north and south banks of the Clyde (see *Builder*, Feb. 9, 1889), passed successfully the first of its various stages. The scheme, which is in the hands of private speculation ostensibly, is strenuously opposed both by the Clyde Trust and the City Corporation, on the primary ground that to the official authority alone should works of the kind be entrusted, and, further, because within a few months practical trial is to be made of cross-river communication by means of a powerful ferry of improved type, as already described in our columns, with the likelihood of thereby conferring a service satisfactory to the public. But these official objectors unfortunately stand convicted, and even confessed, of extreme dilatoriness in the matter of this ferry, eleven years having passed idly away since Parliamentary powers were, at their own request, confided to them for the necessary constructions; and this circumstance, brought out in the examination, seemed to assist the tunnel proposal immensely. After some very outspoken comment on the past behaviour of the Trust, the committee refused to consider any points beyond (1) whether cross-river communication below Glasgow Bridge, other than the old-established crossing by ferry at Govan, was *per se* desirable, and (2) whether the tunnel details of this Bill were workable in practice—both of which even opponents admit—and, receiving satisfaction on these, approved the measure accordingly, and passed it on to the next stage. A wider range of consideration ought, certainly, to enter into any adjudication on a matter affecting so closely the future navigable integrity and powers of expansion of the Clyde below Glasgow Bridge; and if the Clyde authorities, through undue delay, have done a wrong, which at the worst is in a large measure reparable, it would evince but very indifferent administrative craft to precipitate, partly as a punishment on these official laggards,—for it bears a look of the sort,—simply another wrong, which might prove to be irreparable.



The decisive fight is, of course, reserved for the House of Commons stage, not likely to be reached for some weeks, by which time the new ferry steamer will have made some appreciable progress in the yard of the designers and builders, and this fact, it is hoped, will strengthen the not unreasonable view that this ferry method, since it has been approved by Parliament, ought at least to have a trial accorded to it before taking in hand either tunnel or high-level bridge. The tunnelling works of the present Bill, in addition to the horizontal bores below the bed of the navigation, comprise perpendicular shafts at either end for lowering and raising the traffic, hydraulic power being proposed, and they do not pretend to deal with the heaviest loads, which would still have to seek passage by bridge as formerly.

THE Bromley School Board has been occupied in the consideration of a dispute in regard to the conditions under which, in the recent competition for their new school, the plans of Mr. Bell were selected by the arbitrator, Mr. Robson. It appears that Mr. Bell had employed, to assist him in the preparation of his plans, a draughtsman who is in the employ of Mr. Robson, but who is at liberty, as is usual, to occupy himself in any other work out of his own office hours. The insinuation made, in a letter addressed to the Board, is that this amounts to a collusion with the arbitrator. The Board adopted the very proper course of sending a copy of the letter to Mr. Bell and Mr. Robson, and asking for their comment. Mr. Bell replies that he employed an assistant who had special knowledge of the subject, for that reason only. Mr. Robson, expressing great surprise at the communication, replied (as might be expected) that he knew nothing of the matter, and had no control over the engagements of his assistant out of office hours, and that the said assistant had nothing to do with his report, and did not assist him either directly or indirectly in the investigation of the plans. The Board decided to lay the whole correspondence before the Institute of Architects, and ask for their advice; a course which is also to be approved of, if, as we conclude, the Bromley School Board feel unable to decide the question for themselves. As the matter has been referred to the Institute, we shall not anticipate their judgment.

ALL members of the architectural profession, and many outside its ranks, will join in congratulating Sir Arthur Blomfield, A.R.A., on the recognition of professional ability and private worth which has been shown in the official honour of Knighthood just conferred upon him; the rather as it may certainly be said that the architectural profession has been a good deal overlooked of late years in the distribution of honours of this kind.

IN the memoranda which appear frequently in our communications from Paris as to new works in sculpture, it may be observed that we nearly always learn that the sculptor who has been selected for any particular monument has chosen M. — as his architectural collaborator, and that in many cases of competitions for monuments an architect and a sculptor are officially associated on equal terms in the work. We may commend this to the notice of English sculptors, who nearly always profess to design their own pedestals and nearly always blunder them. And even when an English sculptor does see the wisdom of asking the advice or assistance of an architect in designing the pedestal, it is always *sub rosa*, the architect never being openly and officially credited with his share of the work; it is only mentioned privately that "Mr. So-and-so gave some assistance in designing the pedestal," as if it were a matter which it was hardly respectable to mention openly. Is this the way to treat either pedestals or architects? This is certainly one of the "matters they manage better in France."

THE entrance-hall and staircase of the Constitutional Club have just been decorated in colour by Messrs. Campbell, Smith & Co., under the direction of Col. Edis, the architect of the building. The decorations do not include modelled work, but some of the previously-existing modelled decoration has been heightened and brought out by colour, and colour has been applied to the flat surfaces. In the inner octagon vestibule, from which the stairs ascend, the plaster ceiling decoration originally put up by Messrs. Jackson has been entirely gilt, the gilding covering the entablature also. The effect of this is rich, and looks the more so, perhaps, from the rather subdued light in this part; but the gilding over the whole rather obscures the detail of the ceiling. On the staircase, and in the outer vestibule, considerable use has been made of a warm red colour, inclining to orange, with which the lower portions of the circular-headed niches have been covered, throwing out the busts placed in them in an effective manner, while the heads of the niches are lined out in a radiating design with lines of the same colour, which has also been applied as a decorative jointing or simple diaper over part of the wall-surface. In the pilasters on the staircase the relief ornament has been thrown up by a ground which, by comparison with the large amount of red in other portions, looks a little more green than it was probably intended to look. A curious instance of the effect of contiguous objects on colouring is shown in the outer vestibule next the street, for the red dado on the wall behind the mahogany partition for the hall officials, as seen through the openings in the partition, appears of a much duller tone than in other places, though it is really the same colour. The rich plaster ornament in relief on the ceiling and in some of the spandrels of the staircase has been brought out by colouring the ground with a faint delicate yellow tone, with good effect. The scheme of decoration of the staircase walls also includes a series of portrait heads, in full colour, of great Italian poets, which add to the general effect, though their symbolic connexion with the name and objects of the club is not quite apparent. Generally speaking, however, the work is a distinct addition to the entrance portion of this very sumptuous building.

THE June number of the *Art Journal* is one of unusual interest. Mr. Hodgson and Mr. Eaton continue their account of the Royal Academy in the last century, the present article (No. 2 of the series) being devoted to Reynolds, and including a very admirable and just summary of his position in the art, in regard to which it is said that while in every quality of art others had gone beyond him, none had combined so many qualities and in such high degree. Perhaps to add that he was "the most complete all-round painter that the world has ever produced" implies a momentary forgetfulness of the name of Titian. Among the attractions of the article are facsimiles of two or three of Reynolds's roughly scribbled memoranda page of the past to turn over again. Mr. Claude Phillips contributes an article on the Trocadéro Museum, with several illustrations from the examples of Medieval sculpture there. In an article on the Royal Academy, the *Art Journal* makes some perfectly just comments on the unreasonable detraction of the Academy which has been the fashion of late years, and remarks on the high general level kept up by the Academy in spite of all the influence of newer rivals. If the Academy only hung as few pictures as the New Gallery, selecting the best, it would be out and out the leading exhibition, and would be admitted to be so; it is the large number of paintings of mediocre interest which to some extent swamp the higher class works. A short article on the Paris Exhibition is accompanied by some interesting illustrations of English and French ceramic work. Dr. Farquharson, M.P., contributes a short grumble about the decoration

of the Houses of Parliament, or the neglect of it, and inveighs violently against the steps in Westminster Hall; but in his saving clause as to the tact and ingenuity of the additions to Westminster Hall he quite misses the real point. He says, "If the contained rooms are small and inconvenient, that is not the architect's fault, for he had to make the best he could out of the limited space at his disposal." Nonsense! The architect neither had to, nor did he attempt to make the best of the space at his disposal; he admitted in his evidence before the Commission that he did not; he made a "restoration" (so-called) of what was supposed to have been there before, and then labelled the rooms "Committee-rooms" because it was desirable to appear to find some use for them. It is astonishing how little even the more artistically educated House of Commons men (and Dr. Farquharson is one of those) understand what architecture really means.

ON Monday night Mr. Hulse asked the First Commissioner of Works whether he would consider the suggestion (which has been made before) of relieving the traffic of Piccadilly by a road across the Green Park "from the corner in Piccadilly facing Devonshire House, to the right of the Grosvenor-place entrance at the top of Constitution Hill," and another member hoped that instead of that he would consider the propriety of opening Constitution Hill to the public. Mr. Plunket declined to say anything in favour of the first proposal, which of course would be practically destroying the Green Park; as to the second he said it had not been lost sight of. We expect the opening of Constitution Hill will be done sooner or later, but we nevertheless think it will be a very foolish action, in view of those very interests of the public for which it is supposed to be urged. It would be destroying one of the pleasant quiet corners left in London, a kind of oasis in the desert, where all pedestrians can walk freely, and the charm of which will be gone for ever when it is made a public carriage-road.

LATER on in the same evening there was an amusing encounter between Sir G. Campbell and Mr. Plunket about the staircases in Westminster Hall, or rather on "the stone carvings of birds and beasts" which had been placed on the pedestals flanking the stairs, and which Sir G. Campbell and Mr. Cavendish Bentinck regarded as a serious aggravation of the original offence. It was explained that these were heraldic supporters bearing the arms of the Sovereigns who had done most to the building since the time of Rufus, and that Mr. Pearson had further assured the First Commissioner that there were numerous examples of figures and animals on newels of staircases and tops of pedestals, "both with and without heraldic meaning," as we should have thought any man with eyes in his head would be aware. We think the staircases absurd, but we do not think heraldic finials will render them either more or less so. However, Sir G. Campbell could not be satisfied, and again returned to the charge, asking "whether the right hon. gentleman was himself responsible for many of the fearful creatures in Westminster Hall," eliciting the reply from the latter, amid much laughter, that "he was not responsible for the fearful creatures either in Westminster Hall or in this House." On the whole it may be said that Mr. Plunket had the best of it, in spite of the threat to "move a reduction of his salary," which seems now to be one of the fashionable amenities of the House of Commons.

**New Building Regulations in Denmark.**—A Bill respecting new building regulations is before the Danish Parliament, and likely to be passed. By the new measure the post of the present official supervisor of buildings will be abolished, and a Board of five members, with a director, constituted instead. The latter alone is responsible for the actions of the Board.



# ARCHITECTURE AT THE ROYAL ACADEMY. V.

1874. "Reredos erected in Eleventh Church, Hants": Mr. A. H. Skipworth. The reredos takes the form of a triptych, the Crucifixion in the centre and a kneeling woman in each side panel, the whole enshrined amid gilt tracery-work with coloured panels showing between. The drawing is rather too high to see the small detail; the general effect is pleasing, but rather too suggestive of a small organ-case. There is nothing to show how it accords with the architecture of the church: it is better in such a case to indicate the architectural background.

1877. "Design for the West-end Hospital, Welbeck-street": Mr. C. G. Killmister. A small water-colour drawing showing a front of some originality of treatment; a central design in stone with a cornice, with mullioned Jacobean windows and pilasters, and triple arches on the ground-story; the whole relieved against a general ground of wide stripes of red and white brickwork. The drawing is too small to indicate the detail, except that the gable over the cornice has the usual decanter-stopper decorations of the style, perhaps in larger proportions than usual. It is a pity this poor and vulgar form of ornament (?) should be thoughtlessly repeated for the mere sake of imitation of a past style. It is hardly possible that any one can seriously admire it.

1881. "Canterbury Cathedral: interior view of the north-west angle of transept": Mr. H. Wilson. This, which we have before referred to is a good bit of freehand architectural sketching, with the lines of the vaulting very cleanly drawn; but then it is not so difficult to draw clean curves of the vaulting rib as given, all the rest being only indicated at the beginning and end of their course and the intermediate portion left to the imagination. This seems clever and effective to the uninitiated spectator, no doubt; but in reality it is shirking the most troublesome part of the work.

1882. "The Power of Sound: Design for Wall Painting in Music Room": Mr. P. H. Newman. A very carefully finished little bit of decorative design, showing in front of the deck of the galley on which Arion is singing his last song, the occupants of the ship all showing their attention and delight in various ways; on the sea beyond is seen a bevy of mermaids and dolphins, a kind of amplification of the legend of the dolphin that bore Arion to land. The treatment is not true to the legend, as the crew are not pirates, but rather respectable-looking persons, and do not seem the least inclined to compel Arion to jump overboard; but no doubt this makes the design pleasant for its purpose. What should be the sky is a gold ground, partially covered by the sail of the ship, which is elaborately decorated with ornament of a Greek character. All the details are very carefully given, and the whole is an interesting and effective piece of wall decoration.

1883. "Design for Painted Glass": Mr. Rowland G. Jones. An effective piece of Renaissance stained-glass design, the centre white with leaded small panes and a symmetrical trophy design of urn, scrolls, and wreaths in light colour on the white ground, disporting over it. The upper portion has a dark ground, on which similar conventional foliage appears, light against dark. The unbarked tree poles wreathed with flowers and ribbons, in the border, are much too realistic, but the design shows an eye for colour and effect.

1884. "Window in Salisbury Cathedral: north transept": Messrs. W. G. Taylor and W. J. Griffiths. The drawing is rather dull in colour, though in good taste; the treatment of a large lancet window with three broad bands of geometrical ornament across it, dividing the pictorial subjects, does not seem a satisfactory way of treating a window of this type, as it takes away from the vertical character essential to a lancet window, and which the glass design should rather emphasise. In detail the treatment seems good, except that the repeated ornament in the border is rather too strongly marked in its in-and-out lines, and looks jagged and uncomfortable.

1887. "Competitive Design for the Gorton Public Baths": Messrs. Mitchell & Butler. This is one of Mr. Arnold B. Mitchell's brown drawings, and for clear atmospheric effect and picturesqueness it is admirable; but that does not prove, of course, that the baths, of which no plan is given, were satisfactory in arrangement.

A point is made externally of deep buttresses against what seems to be the wall of the main bath compartment, which appear to have rooms between them below, but in the absence of a plan it is impossible to guess how this works in with the practical arrangement. It is a pretty architectural picture, and that is all.

1890. "The Raising of Lazarus: design for stained glass": Mr. W. G. Bailey. We should have said nothing about this had it not been awarded a central position in the hanging. Being placed so, we presume some one in authority in the Academy approves of it. It appears to us an entire mistake as stained glass design. It shows a group of figures in highly-coloured drapery and amid realistic landscape with a perspective distance; around the picture is a border in very light tones and with much white glass, the lines of which cross over at top in a kind of ragged arch-head, giving the effect of looking at the scene through a sheet of ornamental glass with the centre broken out. The object evidently is to throw back the scene in the centre—the very reverse of what ought to be aimed at in stained glass.

1891. "Northington Church, Hampshire": Mr. T. G. Jackson. A tower in Perpendicular style, with inlaid flint work introduced with good effect, especially as a broad wall-arcade pattern under the main window stage of the tower. It is a very correct realisation of the style adopted, though we cannot sympathise in this mere repetition of a past style.

1894. "One of the six aisle windows, St. Patrick's Church, Huddersfield": Mr. Alfred O. Heming. This is also a lancet window, being hung as a pendant to No. 1884, and shows a more correct sense of the proper treatment of the lines of a lancet window. There is one large compartment in the centre of the light, occupied by a figure; and above and below this is a design in geometrical patterns not arranged across but vertically as to the window, and continued above and below the picture compartment. Thus the height of the window is emphasised and increased, instead of being interfered with, by the glass design. Whether it was quite well to carry the picture compartment right across the outer border also may be a question: it makes it seem to hang rather heavily on the composition.

1897. "The Triforium, Wells Cathedral": Mr. A. B. Pite. A rather curious-looking drawing in blueish ink on grey-toned paper, very heavily shaded with the grey paper left for half lights, and some touches of white on the clearstory windows forming the only half light. As an experiment in effect with pen drawing it is interesting, but perhaps only half successful; it was worth a little more pains in the working-out of the shading, and moreover the architectural lines are not quite upright. An ink-photo from this drawing appeared in our pages on Dec. 22 last, but of course this did not convey the effect of the special experiment in tone.

1899. "New Building, Emmanuel College Cambridge": Mr. W. M. Fawcett. This seems intended to show how to render a new collegiate building at an ancient University as architecturally uninteresting as it can be made. This effect is perhaps added to by the mechanical style of the perspective drawing, which looks as if it were done by steam, with "engine-divided" lines of shading, &c.

1900. "A Proposed Church: South Elevation": Mr. John E. Newberry. Knowing as we do some of the drawings that have been refused this year, we cannot avoid asking what is the meaning of hanging this, which looks merely like a pupil's study of a side elevation of a Gothic church, correct and in good taste, but quite commonplace in character? Is it a piece of favouritism from an R.A. to a pupil, or what is it? A plan is added in the corner, from which it appears that the author proposes to place the large transept arches slightly on the skew, so as to widen the church towards the east. Is it this rather unadvisable eccentricity that gives it merit?

1904. "Perspective drawing submitted in competition for church to be erected at Largs": Messrs. J. Burnet Son & Campbell. A very large and rather coarse pen drawing of a powerful design, which we seem to have seen before; possibly in the Architectural Section of the Glasgow Exhibition. The style is Early Gothic, treated in a very broad and massive manner; the west end shows a gabled doorway with a deep archway with recessed chamfered arches, one within the other, springing from the splay of the doorway;

over this are three deeply recessed narrow lancet windows filling up the space between the angle buttresses, with a cornice and parapet over, and a somewhat more enriched gable with a wheel window under a deeply recessed arch. The same massive and stern character is kept up throughout the design. The lofty tower behind has an octagon lantern with stone spire, and solid angle pinnacles with flying buttresses. The low narrow aisles of the nave are evidently for passage only; no plan however is given. The whole is a fine piece of monumental building, with no nonsense about it.

1905. "Design for Transept Window, St. Jude's Church, South Kensington; the Apostles' Creed and their Antitypes": Mr. E. Frampton. We cannot profess to follow out the "antitypes," but this in a decorative sense is a fine design for a large six-light Geometrical window, the tracery and mullions left as blank paper, and the colour design filled into the spaces: not the most effective way to show a stained-glass design in drawing. The main features in the large lights are figures of prophets, with scrolls over their heads inscribed with Latin texts, the space above them filled with light white open-canopy work with a ground of warm broken colours showing through. There is a good deal of delicate diaper-work filling up the space around the heads of the prophets. Below are small scenes representing the main elements of the Creed, we presume. Above, the numerous small lights in the window-head are very artistically filled-up with little designs of cherubim &c., suiting the shape of the lights; in the centre of the large sexfoil light is a figure, in more richly-coloured drapery, of Elijah fed by ravens. The work is an important one of its class, exhibiting a true feeling for stained-glass design, and shown in very clear and pure colour, with a much brighter and more glass-like effect than is the case with many coloured drawings of stained-glass, a form of art so difficult to represent in any adequate manner by mere pigments.

1907. "Thorpe Malzor Church; South Chancel Window": Messrs. Ward & Hughes. A three-light window divided by transoms and foliated heads into nine lights, which are filled with figures representing the nine orders of angels. The figures are pretty in themselves; but the bower-like canopies of foliage under which they stand are not good examples of decorative design for this material; they are too naturalistic, and too thin and weak in line.

1910. "St. Clare's Church Sefton Park Liverpool (interior)": Mr. Leonard Stokes. This we have already illustrated. It is a fine example of solid modern Gothic work, with effect produced by the general character of lines and mouldings rather than by decorative detail, of which there is very little. It shows a nave with a wide centre aisle, a low round-arched ground-floor arcade (quite Gothic in character, however) with a narrow aisle for passage only, arched over from the piers to the outer wall. Above is a very large clearstory, with deep-set windows, which, in fact, appear to come over the centre of the aisle below, and a comparison with the exterior view (No. 1913) shows that the exterior wall above is nearly flush with the lower portion, so that the ambulatory aisle is almost, one may say, in the thickness of the wall. This treatment allows of a look of great solidity and mass in the treatment of the upper part of the nave design. A gallery at the triforium level runs under the windows, which are kept at a little height above it, this space being treated externally as wall-panelling; a narrow passage runs through at the back of each pier. The church has a simple open timber roof with the curved braces showing, and a wooden cornice with angels over each principal in the wide hollow which divides the upper and lower mouldings. The whole is a fine example of exceedingly solid Gothic design, in which the effect is produced by mouldings and by the management of the piers and openings; but the device of carrying up on each pier a large plain wall shaft with much the usual section of a window mullion, only a great deal larger, has rather the effect of diminishing the apparent size of the interior, and if this member were broken up with a moulding or two the effect would be to give more scale to the building. The exterior (1913) derives its principal effect from the range of traceried windows high up on the wall; there is a small transept addition on one side at the altar end, in the upper part of which the organ stands (the organ must in this position be very much thrust out of the church, as well as



cooped up in regard to space); at the junction of this with the church is a small turret and flicho. The clergy-house, a lower building, stands at right angles to the church, and groups picturesquely with it. Altogether this is an admirable and original piece of church architecture, illustrated by excellent drawings.

#### LETTER FROM PARIS.

THERE is to be a grand fête on the Champ de Mars on the 1st of June to celebrate the complete installation of the Exhibition, though it may be doubted whether it will really be complete even then, for some sections are still much in arrear. Thanks to the activity of M. Antonin Proust and his two zealous collaborators MM. Henri Havard and Roger Ballu, the Beaux-Arts Section is at last complete, but it is far otherwise with the Arts Libéraux. That of Histoire du Travail is only just begun, and in the Education, there is still a heap of packing-cases and boxes of books which have been lying in the same state for weeks. It is much the same in Class VII., where some photographic views, plans in relief, and a few cases, are all that is to be seen in illustration of Secondary Education. The department of Higher Education, though also incomplete, presents already a good deal of interest, thanks to the results of scientific missions which have brought together quite a museum of natural history. The printing and publishing exhibition is also unfinished, but that of paper-making, bookbinding, printing materials, &c., is complete, and also the section of photography; and the class of instruments of music is complete, and makes a fine show.

As to the cause of this discreditable delay no one is agreed; some say it is the fault of the contractors, some lay the blame on the architects. At all events, things will not be complete by June 1, however the supposed completion may be celebrated.

The State Manufactures (Gobelins and Savres) are now in possession of the central dome, the place of honour of the Exhibition. The pavilions of the Ville de Paris, long closed to the public, have made great progress, especially that on the left, which includes a good deal of artistic work, and contains some large decorative pictures giving an idea of the style of decoration now favoured in municipal buildings. The sculptures belonging to the Municipality are mostly arranged in the grounds, contributing to the general effect of the Exhibition. The architectural exhibits also include a great deal that is of interest. Among them are a model of Musée Gallieri by M. Glinain, another of the new Sorbonne, and another of the barracks of the Sapeurs-Pompiers of Rouss, as well as a number of plans of various buildings. This collection we will describe in detail on another occasion.

Between the two pavilions of the Municipality, and on the axis of the central dome, is to be placed a monumental statue of the Republic, 7 metres high, intended ultimately for the town of Lyons; it is the result of a competition in which M. Peynot was commissioned to execute the work, who has in his turn commissioned M. Blavette to design the architectural portion of the monument.

The lifts of the Eiffel Tower are in action, and work admirably, to the great satisfaction of the public, who, however, can only mount to the octagonal room on the third stage. There are still twenty-five metres above them, and in this portion, inaccessible to the public, is the enclosure reserved for scientific experiments. Thence a circular staircase of thirty steps leads to the little circular landing whence a tube with a ladder in it furnishes access to the campanile where the electric-light is installed. The cabin in which this is placed is decagonal, and 2.60 metres in diameter and 3.30 in height. The lantern proper is .90 metres in diameter, and rests on an iron tripod. The carbon pencils for the production of the light are surrounded by a glass cylinder. The whole is terminated by a little balcony only .60 metres in width, which forms the cap of the campanile.

The Exhibition is now in full swing as far as attendance goes, but it is sad to confess that Paris has not made the slightest advance in regard to public means of locomotion since 1878. There are a few more river steamers, perhaps, and the number of charrs-a-banc and breaks going to the Champ de Mars is greater

than in that year; but the "Compagnie des Omnibus," which enjoys a scandalous monopoly, has done absolutely nothing to meet the wants of the public. We were led to hope for six new tramway lines to the Exhibition from various quarters; vain hope! though the public of Paris is astonished and indignant at the carelessness of an administration which permits such a state of things.

In connexion with the Exhibition, a competition is to be held for the design for two medals, one a medal of recompense, the other a commemorative medal. The Municipal Council of Paris has also commissioned an artist in medal engraving, M. Levillain, to engrave a medal to be given to M. Eiffel as well as to all the employés who worked on the Tower. This medal, of which the model is already made, bears on its principal face the figure of a woman leaning on a balustrade and looking over Paris from a height.

Whilst the fête of May 6 was in preparation the Municipality very nearly lost their artistic collections at Auteuil by a fire caused by the explosion of fireworks which had been, very imprudently, stored there. The buildings containing the "matériel des fêtes" of the city were reduced to ashes, but the museum itself was fortunately saved. The loss would have been irreparable, for besides the number of models, casts and pictures on view there, there was the splendid collection of ancient tapestries, valued at a million francs. The Municipality ought certainly to take better care of its artistic possessions. Almost at the same time another accident happened at the Trocadéro Cascade, where M. Fremiet's fine group of the elk and serpent suddenly collapsed. It was in plaster-bronzed over, and had been there about eight years, exposed to weather and to the damp arising from the contiguous water, and M. Alphand had in vain asked for funds to have it executed in bronze. M. Fremiet hopes to have the opportunity of producing a new group, in which he will give a different action to the animals. If so, it is to be hoped it will be executed this time in a durable material.

The indifference of the Council in this case is curious, because in general it rather prides itself on acting the part of Mæcenæ, and encouraging artists in a very liberal fashion. It purchases important works from the Salon every year, and on the present occasion, according to custom, is about to make some important selections. Among the pictures which it is intended, according to report, to purchase, will be Roll's fine work "L'Éclat," to which reference has already been made in the article on pictures at the Salon in a recent number of the *Builder*.

The competition opened by the Municipality for a monument to Danton, to be erected in the Boulevard St. Germain, has been recently decided on. Three artists, MM. Desca, Levasseur, and Auguste Paris, had been selected to compete finally, and in this second competition M. Paris has been successful. His work is original and dramatic in character; Danton is represented standing, his arms extended and his head thrown back. Two young men are listening to the tribune, one is cocking his musket, the other has taken up a drum on his shoulders. M. Paris has chosen M. Lépozé as architect for the execution of the pedestal, the same architect who designed the pedestal for the statue of Sergeant Bobillot.

At the same time, a new competition has been opened for the decoration of the Mairie of Nogent-sur-Marne; in which three artists, MM. Debon, Karboersky, and François Lafon, have been selected for the final competition. An architectural competition has also been opened for the rebuilding of the Mairie of the Xth Arrondissement. In this, five designs, by the following authors have been classed in the order given, viz.: those of MM. Rouyer, Le Grand, Paul Wallon, Murcier, and Charles Morand.

The statue to Étienne Dolet, which was the subject of a competition some years ago, is now to be inaugurated on the Place Maubert, where Dolet was burned. We have already mentioned that this statue, a very mediocre work, is the design of M. Guilbert, who also executed the alto-relief decorating the principal face of the pedestal, and which symbolises "La Ville de Paris protégeant la libre pensée." On the sides of the pedestal are two other reliefs, one illustrating the arrest of Étienne Dolet, the other his execution. The pedestal has been designed by M. Paul Blondel, architect.

The Ecole des Beaux-Arts has passed judgment on the designs for a professional school

executed by students in their second year. Out of thirty-five designs submitted, the jury have given "premières mentions" to MM. Jalabert and Sérot, pupils of M. André, and M. Collardot, pupil of M. Guadet. In the "esquisse-esquise" competition, for which the subject was a drinking-fountain with a horse-trough combined, "secondes mentions" have been given to M. Guillaume, pupil of M. André; to MM. Warren, Michel and Plummer, pupils of MM. Daumet and Girault; to M. Fiaut, pupil of M. Glinain; and to M. Louis Lenormand, pupil of MM. Lenormand and Raulin.

The work in the Square du Carrousel is being pushed on actively at present by M. Guillaume, architect to the Louvre. It is to be regretted the work was not commenced earlier, so as to have left this large space open to the public from the commencement of the Exhibition. The orange-trees sent from Versailles now decorate the alleys, and the architect has placed symmetrically, in the grass-plots, columns surmounted by gilt globes which formerly decorated the ancient Grille du Carrousel, which was sold by auction and bought by Prince Sterbey for his fine château of Bécon. There will soon not remain a trace of the melancholy ruins that have long disfigured the site. It is unfortunate that the Government does not take the same action in regard to the Cour des Comptes. The master of a new theatre also, for the Opéra Comique, seems adjourned to the Greek Kalends, and it is announced that the Conseil des Ministres has authorised the establishment of a temporary concert-room on the site of the burned theatre. To build a "café-concert" on the site of the second lyric theatre in France is a pitiable declension, the ridiculous side of which however, probably escapes the notice of the political authorities who have sanctioned it.

The Gare St. Lazare is at last finished, or all but finished. The new pavilion at the angle of the Rue d'Amsterdam and the Rue St. Lazare is devoted to main-line service. Before it extends a large arrival court of 2,500 square metres, smaller however than the court of the pavilion of the Rue de Rome. These courts communicate with each other by a street 18 metres wide situated behind the Terminus Hotel, which itself communicates by a foot-bridge with the "Salle des Pas Perdus" of the station. This latter is an immense room, 200 metres in length, between the Rue de Rome and the Rue d'Amsterdam. The hotel will be almost immediately opened to the public. The galleries which surround the exterior form a covered way lined by first-class shops, which will add a new feature to this busy and animated corner of Paris.

Let us add, in regard to railway management, that the total suppression of level-crossings is now a *fait accompli* along the whole line of the suburban circle railway of Paris. The work, commenced scarcely a year ago, is now entirely finished. These new crossing systems will prevent numerous accidents, and one must congratulate the engineers who in so short a time have completed a work, necessarily carried on under great difficulties, without having interrupted the passenger service for a single day.

We have to record the death of an artist of merit, M. Joseph Navlet, who has died at Paris at the age of 68. He was a pupil of Abel de Pujol, and made his début at the Salon in 1848 by a picture representing the "Departure of Tobias." Most of his works belong to the historic class, and reproduced incidents in Medieval life, among others the assassination of the Duke of Orleans, the death of Jacques Cœur, &c. He painted also pictures representing episodes in the Franco-German War, and left besides a number of water-colours. A conscientious but modest artist, he was little known to amateurs, but obtained a medal in the Salon of 1867.

**Wesleyan Schools, Blackpool.**—In an open competition for designs for new school premises for the Wesleyan denomination, in Adelaide-street, Blackpool, the drawings submitted by Mr. J. H. Burton, of Ashton-under-Lyne, have been accepted by the Trustees.

**The Employment of Children in Spanish Factories and Works.**—The Spanish Government has prepared a Bill prohibiting the employment of children under nine years of age in factories, works, and mines. The maximum hours of labour for children between nine and thirteen is five hours daily, and from thirteen to seventeen eight hours, but never more than four hours at a stretch.



## ETRUSCAN PAINTINGS: BRITISH MUSEUM.

THE British Museum has lately acquired five terra-cotta slabs on which are Etruscan paintings of an archaic and interesting character, such as have not hitherto been seen in this country. These slabs (figs. 1-5) were found at Cervetri (Caere) in 1874, inside a small rock-cut tomb, to which they had served as wall-decorations. The only measurement that has been given of the tomb is that of the entrance, which was 40 in. high. That corresponds with the height of the slabs, and possibly they had been placed against the walls so as to rest on the ground of the tomb. The two sphinxes (figs. 1 and 2), it may be inferred from a comparison of other Etruscan tombs, had been placed one on each side of the entrance. The surface of the slabs has been first covered with a white slip, on which the design has been first sketched in outline with a sharp point and then filled in with reds and blacks, the white ground being allowed to stand for the faces and arms of the women, and for dresses which were meant to be white; the flesh of the men is always painted red. The date of these paintings is probably about B.C. 600. Pliny speaks of the very great antiquity of the art of painting at Caere, and we may take these slabs as representing in general the art as he knew it. The hats worn by the two men in fig. 3 are identical with those on the famous bronze situla at Bologna; they were apparently a local fashion. The standard carried by the middle figure on slab 3 reminds us that it was the early Etruscans who gave the Romans their idea of standards. In this instance, the standard



FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.



FIG. 5.

*Etruscan Paintings in the British Museum.*

is surmounted by a bull, much in the Assyrian manner. Similarly, the branches of pomegranates carried by the figures on slab 4 are quite Assyrian, as are also, to a great extent, the types of the faces and the deep border along the tops of the slabs. Possibly, therefore, these slabs tend to confirm the belief of the Etruscans that their ancestors had come to Italy from Lydia, in which case they would have brought with them customs prevalent in Asia Minor.

Mr. Murray has arranged the slabs in a different order from that which was proposed at the time when they were found. By placing the slab No. 4 in the middle he gets a continuity in two ways of the procession of mourners. The high boots worn by two of the women in fig. 4 remind us of the fame of ancient Etruscan boots. These women carry their skirts over their arms in a peculiar fashion. The foremost woman in fig. 5 appears to be undoing a metal girdle, which as she undoes it springs into coils round her body.

## THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

It has been determined by the executive of the Cambrian Archæological Association to hold its annual congress this year in Brittany, in order to compare the pre-historic antiquities which are so numerous in that district with those which exist in the Principality. The visit has been long meditated, and this year appears to be a very favourable one for carrying out the project.

Since it will hardly be possible for the whole of the members generally present at the congresses held in Wales to attend it, it was arranged to hold a preliminary meeting in London, to give such members the opportunity of holding a meeting, and it was considered that it would afford valuable results by enabling Welshmen to study various ancient documents relating to the early history of their country, preserved in the various public museums of the Metropolis.

The meeting commenced on Tuesday, May 21,

when the members assembled at four p.m. in the rooms of the British Archæological Association in Sackville-street, and settled various matters of detail relating to the Brittany excursion, which will be held later in the year.

On Wednesday, the 22nd, a visit was paid to the British Museum, for the purpose of inspecting some of the Welsh manuscripts forming part of the national collection. Assembling in the entrance-hall at eleven o'clock, the party was received by the authorities, and, by permission of the Principal Librarian, a number of ancient documents were examined. These were lucidly described by Mr. W. de Gray Birch, F.S.A., and Mr. Scott, F.S.A., and the members were not a little surprised at finding so large a number of records in existence, many being evidently not known to them. Many hours were devoted to the examination.

In the evening a meeting was held in Sackville-street, by invitation of the British Archæological Association, and was well attended by



the members of both societies. The chair was taken in the first instance by Mr. Thos. Morgan, F.S.A., Honorary Treasurer of the British Archaeological Association, who, in a graceful speech, welcomed the members of the Cambrian Association to London, and reminded them of the cordial welcome rendered to his own Society on two occasions in Wales. After referring to the active work of the Cambrian society years, he vacated the chair that the meeting might be continued for the reading of papers by members of the Welsh society. Before he did so, Mr. Geo. R. Wright, F.S.A., endorsed the chairman's remarks, and invited the party to refreshment prepared for them. The chair was then taken by the Rev. Prebendary Thomas, who returned thanks for the courteous reception. A lengthy and learned paper was then read by the Rev. E. McClure, Secretary of the Society for the Promotion of Christian Knowledge, upon "Early Welsh (in relation to other Aryan) Personal Names." A great many ancient Welsh documents and customs were referred to trace the earliest examples of names, since very few ancient names now remain in the Principality. The documents in question, however, have preserved a vast number, and the lecturer indicated that these can be traced to very early sources. Owing to the advanced hour, other papers were not proceeded with.

On Thursday, the 23rd, a visit was paid to Lambeth Palace, where the party was received by the Archbishop of Canterbury, and the ancient documents, more particularly those relating to Wales, were described by the Librarian, Mr. S. W. Kershaw, F.S.A. Owing to the shortness of the invitation, many of the party missed the opportunity of being present.

The afternoon was devoted to a visit to the Record Office, by permission of the Deputy-Keeper. Here, again, a large collection of ancient manuscripts recording Welsh events, &c., was inspected, and Mr. R. Arthur Roberts pointed out a great number of their special features.

Another evening meeting followed, again in the rooms of the British Archaeological Association, the Reverend Prebendary Thomas being chairman. The proceedings were commenced by the reading of a paper upon the remarkable Cylindrical Pillar at Llantwit Major, Glamorganshire, by Mr. J. Romilly Allen, F.S.A. (Scott.). The pillar, which stands against the north wall of the church, is grooved on one side along its whole height, as if for the insertion of a slab, and the surfaces are covered with elaborate interlaced work, the principle of the formation of which was described by the lecturer.

An elaborate and interesting paper was then read on "Some MSS. and Seals relating to Wales, in the British Museum," by Mr. W. de Gray Birch, F.S.A. The paper was an attempt to render something more than a catalogue of the more important documents in the Museum for future use, and an enormous number were noted, all of which were of value to elucidate the history of the country. The seals were equally numerous, those of Llewellyn, Prince of Wales, the English princes, Owen Glendower, the English kings and queens, the seals of counties and of groups of counties, being especially mentioned. A representation of Llandaff Cathedral appears on an early seal, and a different view on a later one. A good view of St. David's Cathedral also appears on a seal. The Welsh monastic seals are also numerous and important, many of them being altogether unedited. The paper concluded with a suggestion for the formation of a museum for the collection of documents distinctively Welsh, in one or other of the cathedral cities of the Principality. An interesting discussion followed, in which Professor Rhys, Mr. Kershaw, and many others, took part. The proceedings were brought to a close by a paper upon the "Religious Houses of South Wales" by Mr. J. W. Willis-Bund, F.S.A. The lecturer pointed out that these abbeys were not founded by Welsh princes. Such an act would have been treasonous to the country, since they became so many strongholds of the Norman foe. They were mainly erected by the invaders. This was shown by a large amount of curious documentary evidence.

Friday, the 24th, was devoted to a visit to St. Albans. On arrival at the west door of the cathedral, the large party of ladies and gentlemen was met by the Rev. Canon Davys, on behalf of the cathedral authorities, and by the

Rev. H. F. Fowler, representing the St. Albans Architectural and Archaeological Society, under whose guidance the cathedral was minutely inspected. There was every desire on the part of the members and their friends to confine their attention to what ancient work is left at St. Albans, but Lord Grimthorpe's fearful additions are but too obtrusive. The two transepts are ancient no longer, so far as their fronts are concerned. The south transept was defaced last year. The north transept has just emerged from the builder's hands disfigured with a huge wheel window of nearly the whole width, painfully out of scale with its surroundings, flanked by two obtrusive turrets of as mean design as those on the south side. Scaffolding is now erected around the choir, and the same ruthless work is in progress among the quaint and picturesque detail. Weather-worn stone, mellowed Roman brick, artistic mouldings, all alike are in the most extreme danger. The Lady-chapel is about to be restored by Mr. Gibbs, under the direction of an eminent architect, and the party heard the good news with evident satisfaction from the lips of Canon Davys on arriving at the extremity of the building.

Thanks having been rendered by Prebendary Thomas in the name of the party, a halt for luncheon was made, after which a visit was paid to the Church of St. Michael, within the ancient area of the ruined city of Verulam. The church was described by Mr. Loftus Brock, F.S.A., in the absence of the Vicar. The pre-Norman date of the masonry of the nave can now be readily demonstrated, since, in the restoration of the church, the traces of early windows of Roman brick, cut through by later Norman arches, were kept open for observation. The fabric does not follow the lines of the Roman streets of the city, but is orientated, as is usual in England, and is, in consequence, set diagonally to them. Under Mr. Brock's guidance, the circuit of the best portions of the Roman city walls was made, and the construction observed. Through the whole length of their extent, it was pointed out, there is no sign of the use of pounded brick in the mortar. The irregular plan of the city suggests that it is of the same form as the earlier British town, which occupied the site prior to the advent of the Romans. The excavations made by the British Archaeological Association in 1869 were detailed, and a plan showing the results obtained was exhibited. The positions of almost all the roads were determined by these excavations, and they proved to be not quite at right angles one to another.

All the area of the city is now under cultivation, and nowhere does any of the buried masonry of the ruined buildings come to the surface.

The party returned to town by various trains, many of the members lingering over the ruins of past ages, and all well pleased with the week's work. The weather throughout was magnificent, and every spot visited was seen under the most favourable auspices.

#### ARCHITECTURAL ASSOCIATION VISIT.

The final visit of Session 1888-89 was made on Saturday last to Kensington Court, when the latest addition to the group of mansions occupying the former site of Baron Grant's palace was inspected. This is a house for Mr. R. K. Crompton, the electrical engineer, designed by Mr. John Slater, B.A., past president of the Association, and now in course of erection by Messrs. Kirk & Randall. As an instance of the application of modern constructive science to domestic architecture the house is particularly interesting, iron construction of an advanced order being largely and boldly employed, both for floors and roofs, with the result of great advantages in the matter of plan. By the free use of girders and stanchions, together with Lindsay's steel decking for the ground floor, the architect has found himself unfettered by the usual necessity of supporting walls upon walls, and consequently has been at liberty to arrange his plans with considerable freedom. As an instance of the extent to which ironwork has been utilised may be mentioned the main girder, carrying a load of 120 tons over a span of 25 feet. The principal rooms are the dining-room and school-room on the ground floor, the boudoir and drawing-room on the first floor, and the laboratory on the second floor. Other features of interest are the lighting, which is to be wholly by electricity; the heating, principally

by gas, including the cooking apparatus in the kitchen; and a passenger lift, in addition to the staircases, which run from the basement to the attic. Unfortunately the interior of the building was not sufficiently advanced for the visitors to see the more artistic finishings—the ceilings, panellings, and staircase, the ornamental ironwork of which latter is, we believe, to be supplied from Nuremberg. The exterior is carried out in red brick and stone, severely treated with Tudor detail, a good feature being made of the large oriel window to the drawing-room.

After inspecting the house, the members, under the guidance of Mr. Crompton and Mr. Slater, visited the central electric lighting station adjoining, where in a remarkably small space, are concentrated the machinery and dynamos and secondary batteries for the distribution of electrical energy to the houses in Palace-court and the vicinity. This establishment is to be shortly considerably enlarged from the plans of Mr. Slater, to meet the increasing demand for electric lighting in the neighbourhood.

#### WROUGHT-IRON GRILLE.

This piece of wrought-iron work, by Mr. S. C. Hobbs, received the first prize in the last competition for artisans and art-workmen at the Society of Arts.



Wrought-iron Grille: by Mr. S. C. Hobbs. (Awarded the Society of Arts' Prize for original design in ironwork.)

#### MODERN GUTTER-SPOUT, NUREMBERG.

This characteristic bit of modern ironwork is from a small internal courtyard of the German National Art Museum at Nuremberg.



It stands out about 3 ft. from the eaves-gutter, from which it leads the water.

**Mission Hall, Reigate.**—On Friday, May 24, the memorial-stones of a new Mission Hall at South Park, near Reigate, were laid by Lady Henry Somerset, of Reigate Priory, and Mr. W. H. Tyndall. The architect is Mr. T. Rowland Hooper, of Redhill, and the contract has been taken by R. Lee & Son, of Reigate.



### "HATCHLANDS," SURREY.

THE following is the architect's description of this plate, which was published last week, but of which the description, as then mentioned, was unavoidably delayed:—

"Hatchlands" is situated on the north side of the Downs, about five miles east of Guildford, between Horsley and Clandon. The house was built about 1760, and, though externally rather bald, contains beautiful carved woodwork and moulded plasterwork in the rooms.

The additions involved making a new entrance, large entrance-hall, &c., turning the present entrance into a garden door, &c. Besides these, the scheme is to form a formal garden, with terraces, bounded with a colonnade leading to an orangery, as shown in the drawing. It is intended to compensate for the want of a distant prospect of Nature (except where the house looks on its own park) by providing a foreground where all forms are the result of art and of labour; to make the surroundings architectonic, in sympathy with the severity of the architecture of the house.

HALSEY RICARDO."

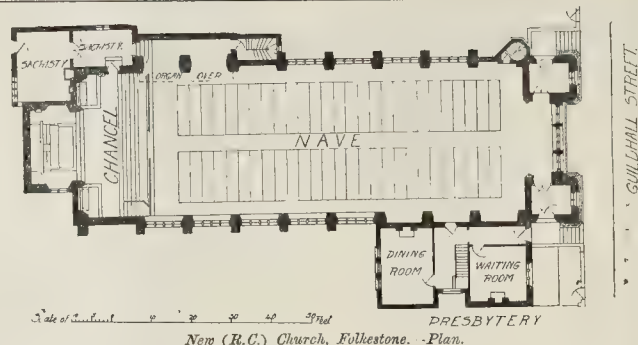
### Illustrations.

#### LIVERPOOL UNIVERSITY COLLEGE.

THIS is a reproduction, from the original drawing in the Royal Academy Exhibition, of the important range of buildings now in course of erection for the authorities of the Liverpool University College, from the designs of Mr. Alfred Waterhouse, R.A. The buildings are to occupy a site at the corner of Brownlow-hill and Ashton-street, the principal frontage being to Brownlow-hill and facing south. Generally speaking a parallelogram on plan, its total length will be about 250 ft. It will adjoin the nearly-finished Engineering Laboratories (shown in the illustration west of the main block), also designed by Mr. Waterhouse, and the gift of Sir A. B. Walker, Bart.

The range of buildings seen on the left of the tower consists on the ground and first-floors of a double row of class-rooms and professors' rooms, separated by a spacious corridor lined with glazed bricks. On the second-floor is placed the library, upwards of 100 ft. long and 50 ft. wide, the low-roofed aisle towards the street being divided into bays. It has an open timber roof, and is lighted by large dormers at intervals, as well as by a series of windows at a lower level. At the entrance to the library will be placed a bust, by Mr. Gilbert, A.R.A., of Mr. Tate, the donor of this part of the building. The approach to the library and class-rooms is from the tower adjoining, which is to be erected from a portion of the funds subscribed for Liverpool to commemorate Her Majesty's Jubilee. Its total height, from the street level to the apex of its lead-covered spire, will be about 170 ft. The upper part of the tower will contain a clock, and the exterior will be enriched with the Royal Arms and an appropriate inscription.—this last, as well as the clock-dials, being in glass mosaic. On the right of the tower is the principal staircase, giving access to all parts of the building. Behind this, and approached by the tower entrance, is the entrance hall, 50 ft. by 30 ft., and two floors in height; its walls internally, as well as those of the vestibule and principal staircase, being lined with buff terracotta. In the hall is to stand the statue, by Mr. Bruce Joy, of Mr. Christopher Bushell, one of the founders of the College. An arcaded gallery across the south end of the hall connects at the first-floor level the blocks on either side. The staircase balustrades will be in terra-cotta, the stanchions supporting the flights being encased with faience. Above the hall are art class-rooms and a spacious art lecture-theatre. The angle of Brownlow-hill and Ashton-street is devoted to the great lecture-theatre, additional access to and egress from which will be gained by a separate staircase in the circular tower at the corner of the streets; the theatre itself is at the second-floor level, semicircular on plan, with a chord of 70 ft., and a height of about 30 ft. from floor to ceiling; it will contain a semicircular gallery, and accommodate altogether about 450 students. There will be an extra staircase at its north-east corner. On the floors beneath this theatre are placed common and reading-rooms, for both male and female students.

The construction of the floors and staircases throughout is fireproof.



New (R.C.) Church, Folkestone. Plan.

Heating and ventilation will be effected by means of hot-water radiators placed beneath the windows, where fresh-air is also admitted. The vitiated air will be carried downwards by extract-flues in the walls to trunks beneath the ground-floor corridors, these trunks conducting to a ventilating-tower at the north-west corner of the theatre block.

Around the building, externally, is carried a high stone plinth. Above this the general treatment of the walls is in alternate bands of grey Liverpool and red Ruabon bricks, the window-dressings and principal architectural features being in red terra-cotta.

The roofs generally will be covered with green Westmoreland slates.

#### NEW BUILDINGS FOR THE CAFÉ MONICO.

THE second illustration which we publish this week is a reproduction of the drawing hung in the Royal Academy Exhibition, and shows the new front of the Café Monico towards Shaftesbury-avenue.

The elevation is composed entirely of the Burmanoffs Company's buff terra-cotta on a polished grey granite plinth.

This new block of buildings is an addition to Messrs. Monico's already extensive premises, and contains on the ground-floor a large grill-room and luncheon-bar, with central entrance to the original café saloon, a marble staircase leading to the first-floor, which contains a spacious table d'hôte room 70 ft. long by 30 ft. wide. On the second-floor are the Masonic or private dining-rooms.

Prior to building this new block, Messrs. Monico went to considerable expense in enlarging their premises in Piccadilly-circus, decorating them in a permanent manner with marble wall-linings, &c.

The new addition in Shaftesbury-avenue has been erected by Messrs. Kirk & Randall, and the architects are Messrs. Christopher & White.

The first-floor of the new building has been recently decorated by foreign artists under Messrs. Monico's personal superintendence, and they are now about to decorate the ground-floor. For this part of the decoration of the building Messrs. Christopher & White are not responsible.

#### DENHAM COURT, NEAR UXBRIDGE.

WE publish this week a drawing showing a view of the new oak staircase and lower hall at the above-named mansion, for the owner, Captain Swinbank.

There is over this hall a handsome billiard-room, and the works included an extensive remodelling of the remainder of the house.

The work was executed by Messrs. Farnidge & Son, Uxbridge, the architects being Messrs. Christopher & White.

#### NEW (R.C.) CHURCH, GUILDHALL-STREET, FOLKESTONE.

THIS church, with its presbytery, has been erected from the designs of Mr. Leonard Stokes, and is constructed of red brick, with stone dressings. The church will accommodate about 500 people, and is designed so that every one in the church may see the altar. Another design for this church, &c., was exhibited last year at the Academy, but that design had to be abandoned. Our illustration shows the building as executed, and is taken from a drawing now

being exhibited at the Royal Academy. Mr. Moody, of Folkestone, is the builder.

#### THE NEW CATHEDRAL AT MARSEILLES.

WE give this week a view of the west front of the new Cathedral at Marseilles, from a photograph. The building is still in progress, and the scaffolding not entirely removed; but the view shows the front complete.

On another plate are illustrations of two pieces of decorative sculpture from the building. These are the design of the architect of the building, M. Révoil, and have been executed from his drawings by M. J. Brémont. The one with the two winged griffins is over the side door to the right of the principal façade, that of the harts drinking in the similar position on the left.

Marseilles, the third town in France, and the first port, is very deficient in important architectural monuments. The only public buildings worth speaking of are modern, and the churches, except Notre Dame de la Garde and the new Cathedral, have nothing to attract the attention of the artist. The ancient cathedral, called "La Major," and which, according to tradition, marked the site of a temple of Baal, is now a ruin of little interest. The new basilica which is to replace it was commenced thirty years ago from the designs of Léon Vaudoyer, who died in 1872, when Esplanade, his pupil, was entrusted with the work; and when he died two years after the direction passed into the hands of M. Révoil, who is still carrying it on.

The site has been admirably chosen; it is an esplanade near the Quais de la Joliette, and raised about ten metres above the sea level. The principal façade is entirely built of white stone of Calissances, alternating with a grey stone from Florence. The deeply-recessed porch giving access to the building is decorated with a rich mosaic on a gold ground. The two towers are 55 metres in height.

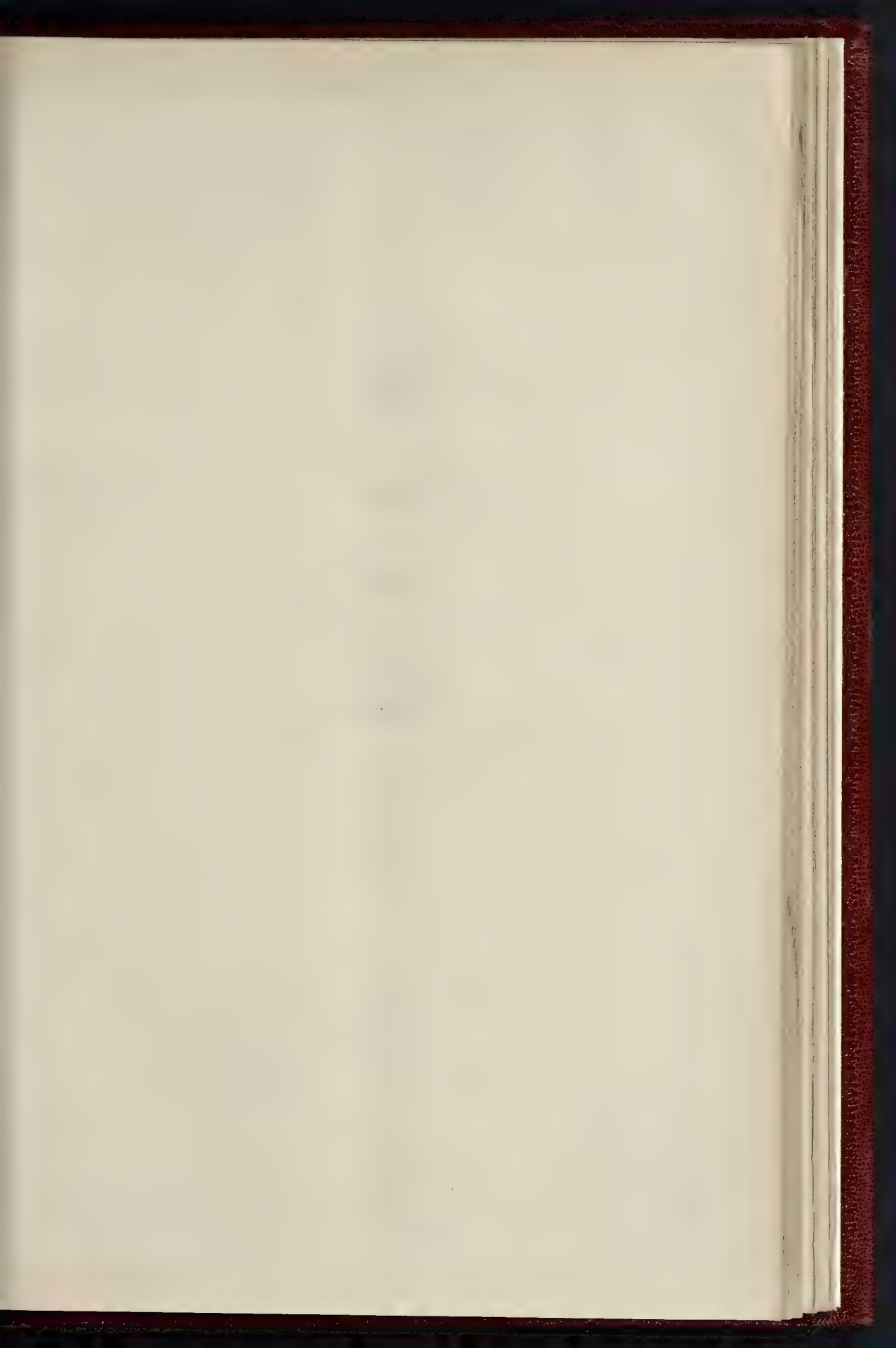
The same system of masonry in two tones is adopted in the lateral façades, but here the stones employed are Calissances and Galfalina. At the intersection of the nave and transept there is an octagonal dome 77 metres in height, with two lower cupolas, all covered with lead.

The general arrangement of the church will be seen from the plan. The interior is intended to be completed in a very rich manner, with a great deal of coloured marble, but much of this work has still to be completed. An illustration of one of the capitals of the nave is subjoined. Each bay is divided into three arcades of which the spandrels are decorated in Venetian mosaic. Above is a gallery with a richly-carved balustrade of Echallion marble; this gallery is lighted by stained-glass windows produced by M. Didron, of Paris. The interior of the principal dome has been decorated with sculpture by M. Allar.

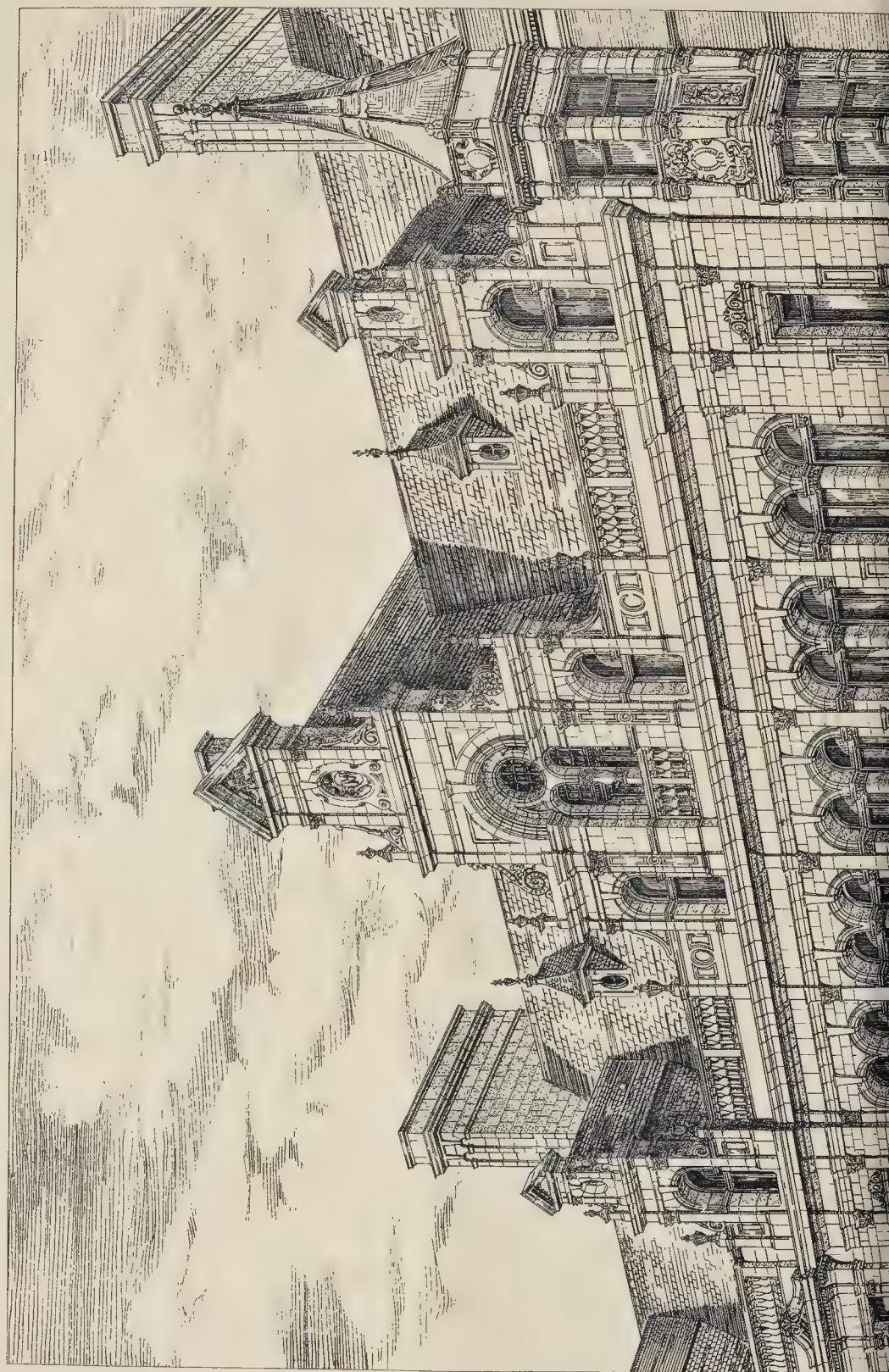
The choir, raised several steps, is surrounded by arcades separated by square pilastered piers carrying a series of tribunes partially supported by columns of green marble. This part of the church is the least advanced. Behind the choir is the Lady Chapel, at the extremity of the apse, with six other semi-circular chapels, to right and left. The windows of the choir and transept are the work of M. Martin, of Avignon. The decoration generally is by M. Cantini; the mosaic has been executed by M. Mora of Nîmes.

The Cathedral is 140 metres in length,





THE BUILDER, JUNE 1, 1889.





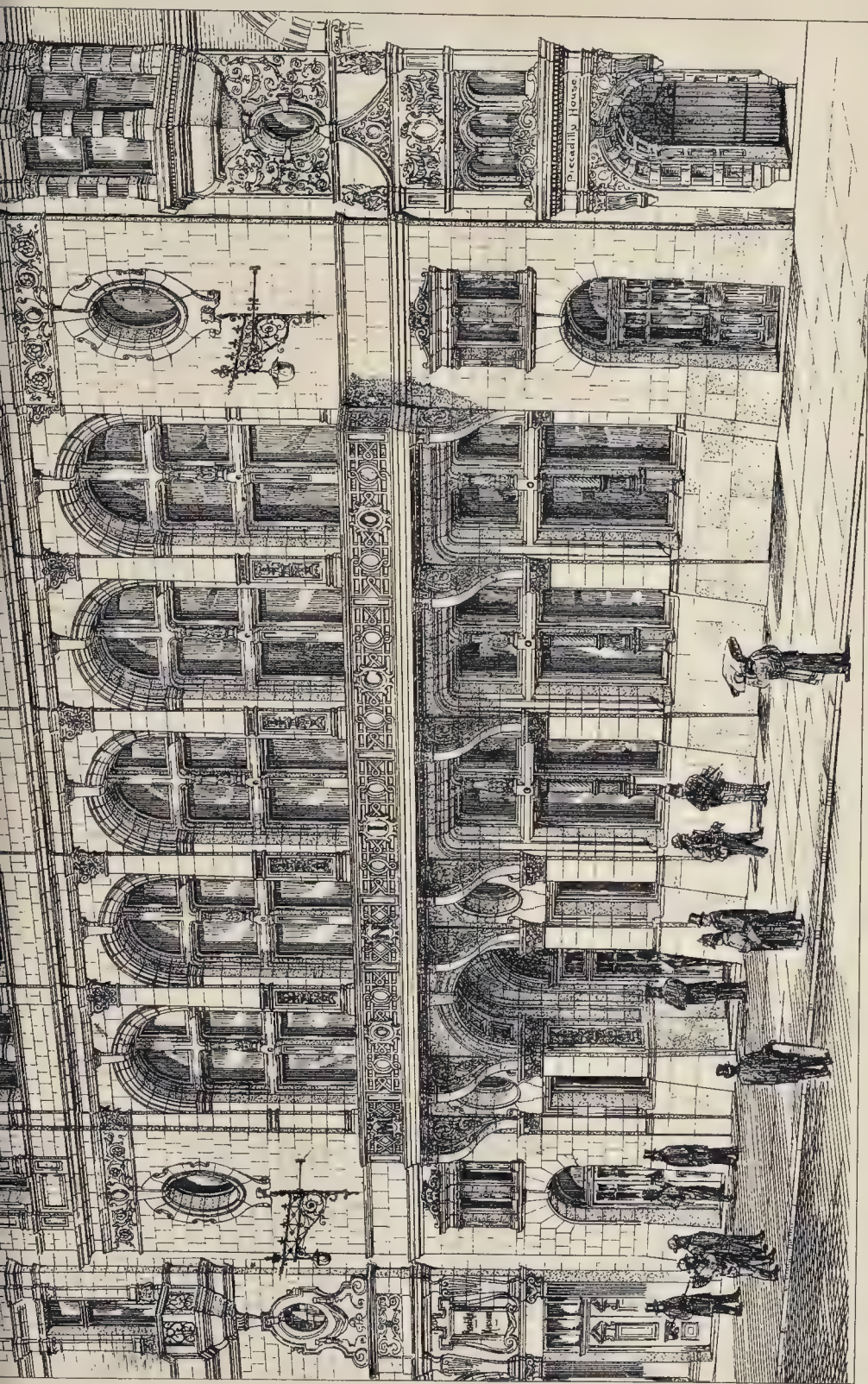
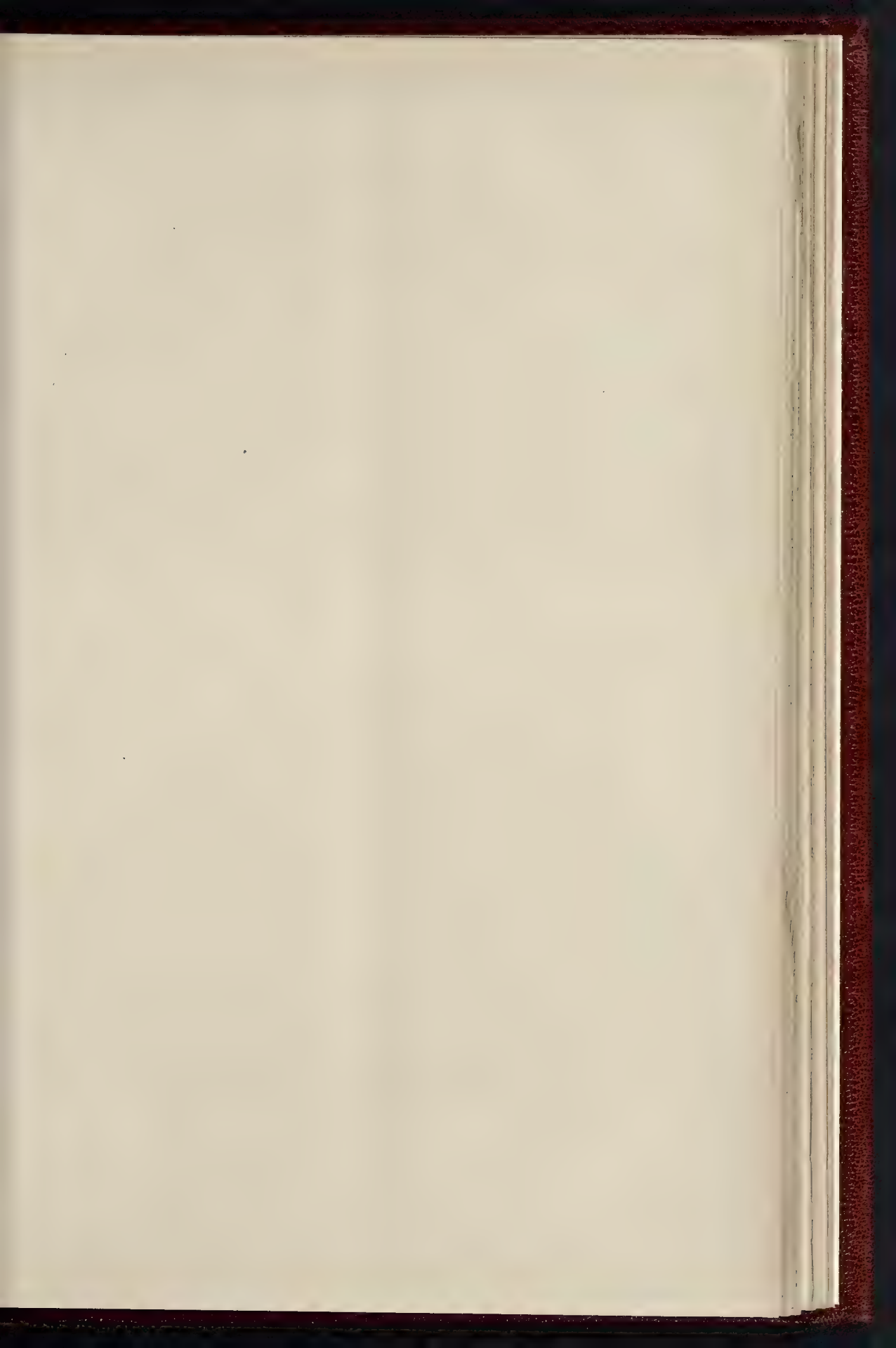


PHOTO. LITHO. SIMPSON & CO. 22, MARK LANE, LONDON, E.C.

NEW BUILDINGS, CAFÉ MONICO, SHAFTESBURY AVENUE.—MESSRS. CHRISTOPHER & WHITE, ARCHITECTS.





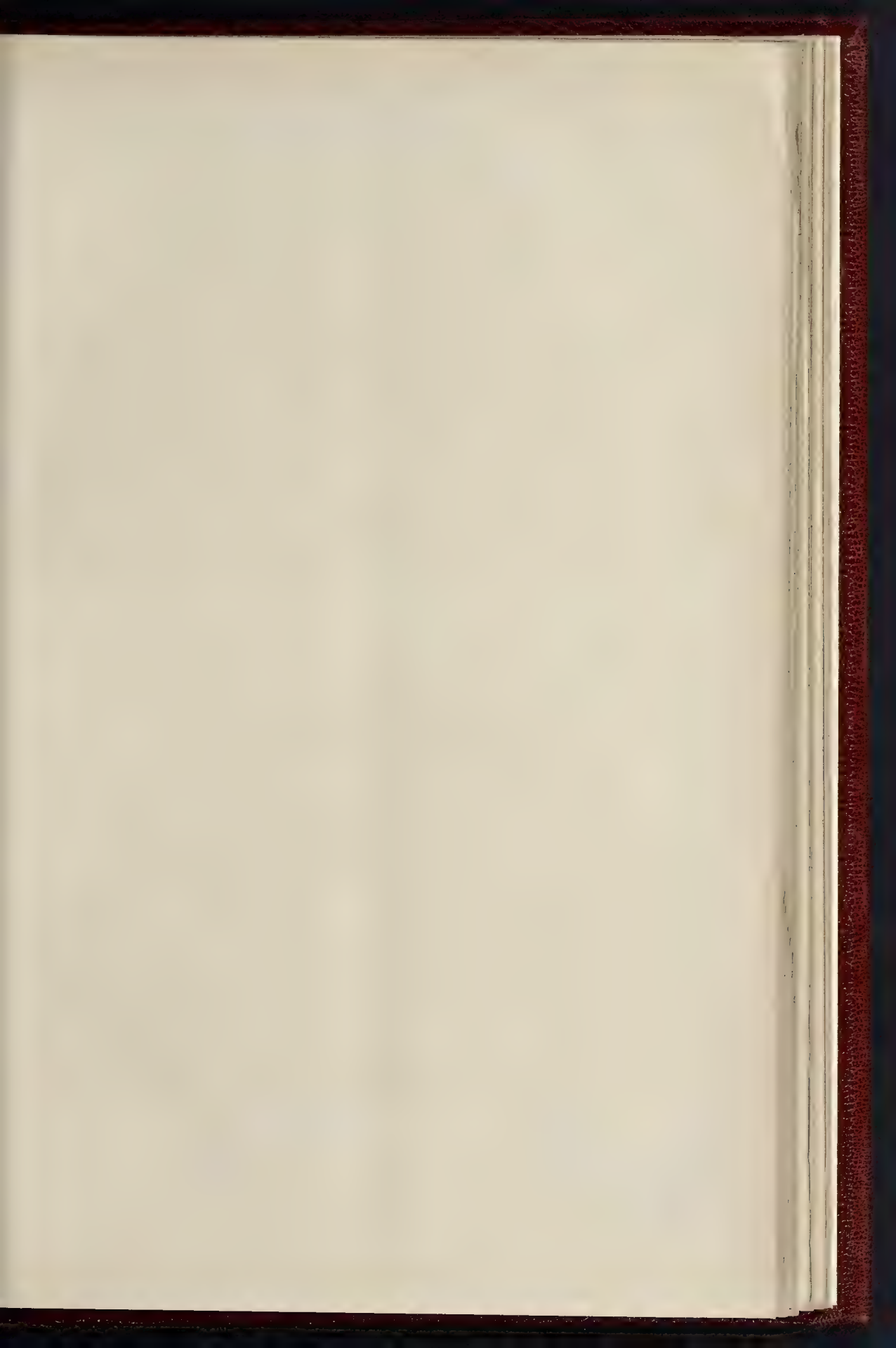




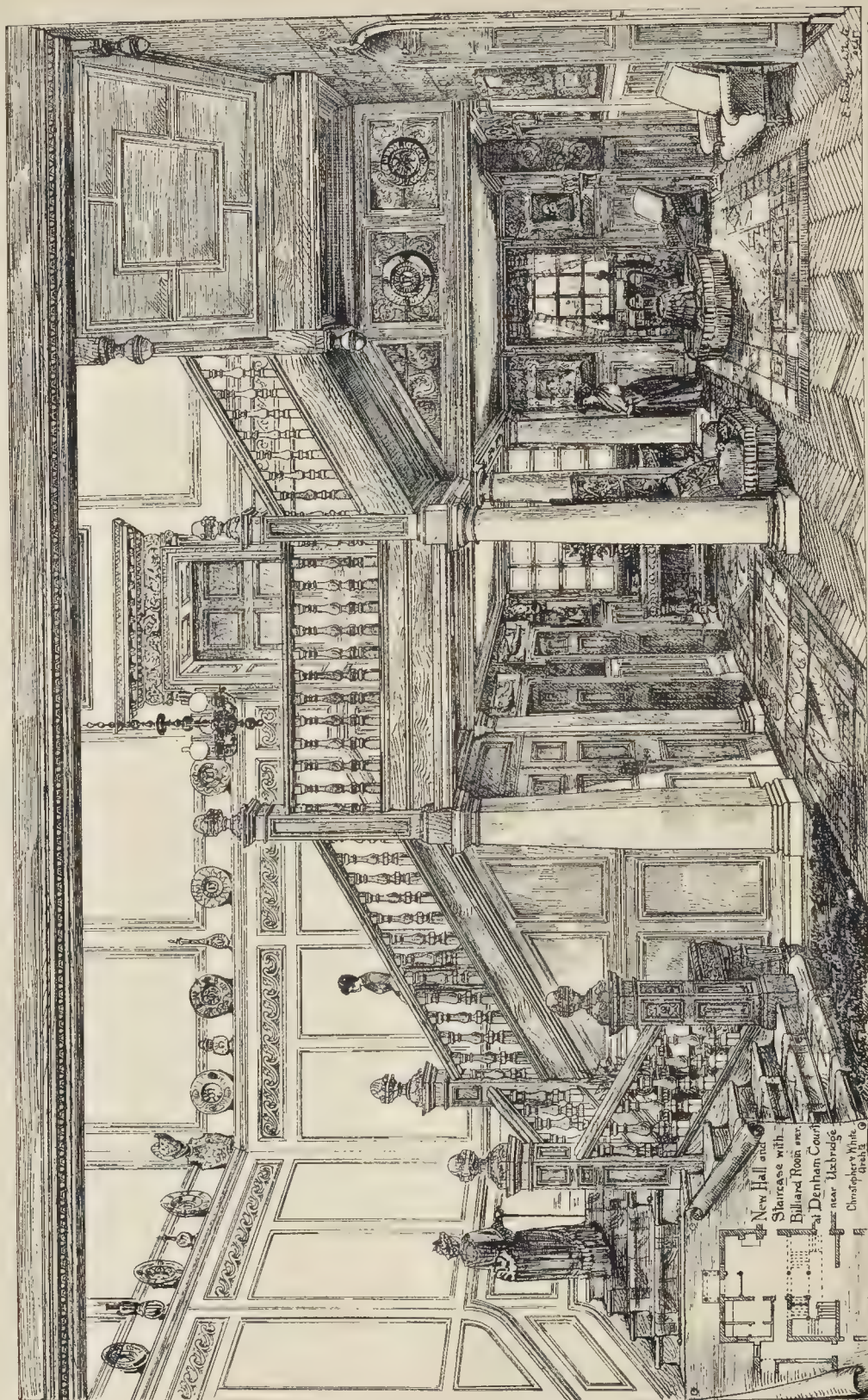
The Phototype Co., 30, Strand, London.

DECORATIVE SCULPTURE IN THE CATHEDRAL, MARSEILLES.

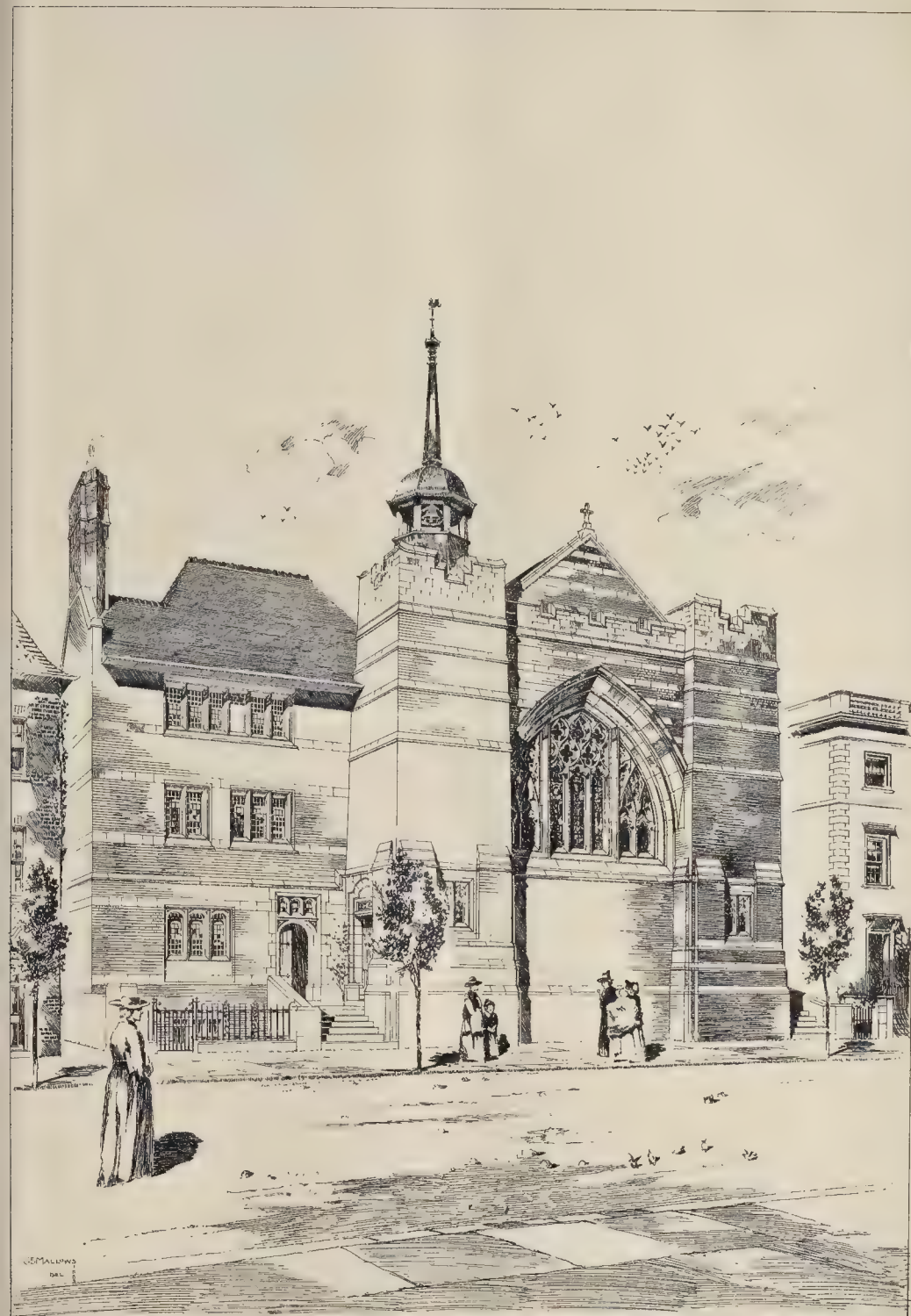




THE BUILDER, JUNE 1, 1889.



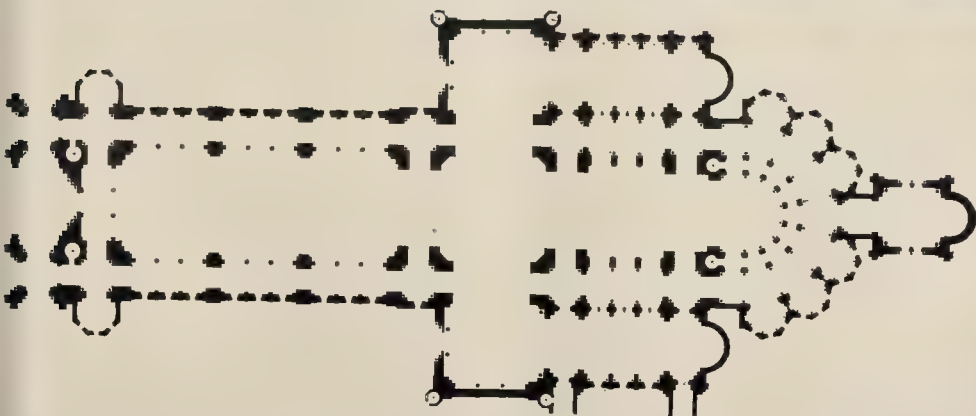




NEW CHURCH (R.C.) GUILDHALL STREET, FOLKESTONE.—MR. LEONARD STOKES, F.R.I.B.A., ARCHITECT.





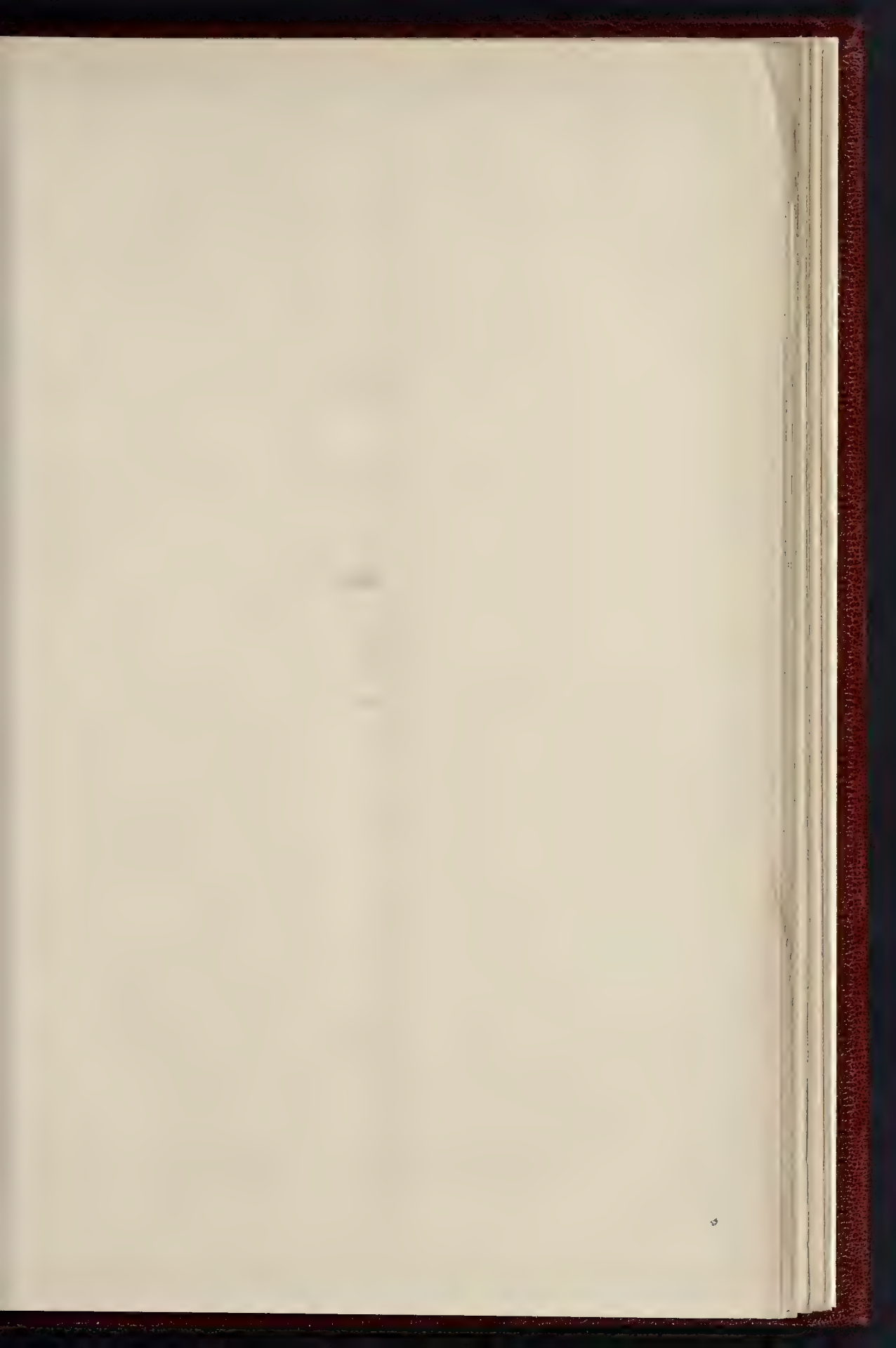


The Phototype Co., 33, Strand, London.

THE NEW CATHEDRAL OF MARSEILLES. WEST FRONT AND PLAN.









UNIVERSITY COLLEGE, LIVERPOOL: BROWN





INK PHOTO-STRAUSS & CO. 22 MARK LANE, LONDON E.C. 3

FRONT.—MR. ALFRED WATERHOUSE, R.A., ARCHITECT.







Capital in the Apse of the New Cathedral, Marseilles.

internal measurement, and 55 mètres across the transepts.

It was in 1852 that the first stone was laid by the "Prince President," but the work was not really commenced till 1858. Since then the building has progressed very slowly amid impediments of all kinds, partly arising from the ill-will of the Municipality of Marseilles, which is indifferent to aesthetics and hostile (on principle) to ecclesiastical art. The cost of the construction has amounted so far to twelve million francs, and two millions more would be required to complete it, without counting the cost of furnishing; and the additional 400,000 francs which is estimated for the construction of sacristies; and it is difficult to predict a date for the opening of the building which the late M. Balu, in his biographical notice of Léon Vaudoyer, referred to as "the most colossal religious monument of the nineteenth century."

#### THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday last in the Council Chamber, Guildhall, Lord Rosebery in the chair.

*The Seal of the Council.*—After the confirmation of the minutes, the Chairman called attention to Mr. Walter Crane's completed design for the Seal, which the Standing Committee thought very graceful and worthy to be accepted.

*Building Trade Operatives and the Council.*—The Chairman then said:—The other day the Building Trades Committee, a working men's association, wrote asking us to receive a deputation on the question of contracts. This letter was referred to the Main Drainage Committee, as it was supposed that it related to the fixing of one of the contractors at the outfall sewage works. The Main Drainage Committee in due course heard the deputation, but only on the question of sub-contracts. I have since received another letter from the Building Trades Committee complaining of what they deem to be a breach of faith, they having expected that they would be heard on the whole subject of contracts. I have referred to the whole of the correspondence, and I came to the conclusion that, quite unwittingly on the part of the Main Drainage Committee, they did give the representatives of the workmen some ground for supposing that they would be heard not only upon the particular question which had arisen in connexion with the main drainage works, but upon the whole subject of contracts for the execution of works. That subject is so important that I venture to suggest that it would be best to appoint a Special Committee to consider that subject, such a Committee to consist of the chairmen of all those standing committees of the Council who are specially interested in the question, together with such other members of the Council as the Standing Committee, at the next meeting of the Council, shall recommend; and that that committee be entrusted with the duty of examining the whole of our contracts and of receiving and hearing the deputation on the subject.

On the motion of Councillor John Burns, seconded by Alderman Barker, the Chairman's suggestion was adopted without discussion.

*The Whitsuntide Recess.*—On the motion of Mr. Harben, it was agreed that the Council, at its rising on Tuesday next, June 4, do adjourn until Tuesday, June 18, no Committee meetings to be held in Whitsun-week except by special arrangement.

After spending an hour in the discussion of the

Fire Brigade parade *fiasco* of Saturday last, nearly as much time was spent in discussing the

*Appointment of Clerk.*—On this question the Standing Committee presented the following report:—"The attention of your Committee has been directed to the necessity for the early appointment of a Clerk of the Council. The office is created by the Local Government Act, 1888, and has specific functions attached to it. The Council is aware that Mr. De la Hooke, who for many years was the Assistant Clerk of the late Metropolitan Board of Works, was nominated by the Council to act temporarily as Clerk, and has been so acting since the first meeting of the Provisional Council on Jan. 31. His long service of twenty-four years with the late Metropolitan Board has given him knowledge and experience which your Committee believe will prove highly useful in carrying on the work of the Council. They therefore consider that he should be appointed to the office of Clerk. Upon the question of salary, your Committee find that Mr. De la Hooke has for some five or six years been in receipt of a salary of 600*l.* a year as Assistant Clerk of the late Metropolitan Board, the Clerk of that body having received 1,000*l.* a year. Your Committee are of opinion that Mr. De la Hooke's salary should now be 800*l.* a year, and that it should gradually rise to 1,000*l.* The recommendation which they submit is—

That Mr. H. De la Hooke be appointed, during the pleasure of the Council, Clerk of the County Council of the Administrative County of London; that he do discharge the statutory duties prescribed by the Local Government Act, 1888, and other Acts of Parliament, and such other duties as the Council may from time to time determine, and do exercise supervision over the Clerk's department; that his salary be 800*l.* a year as from the 25th of March last, and that it be increased by annual instalments of 50*l.*, until it reaches 1,000*l.*"

After two or three amendments moved and supported by some of the "economists," and much inquiry as to the way in which this appointment would be affected by the Council's recent anti-pension resolution (Mr. Firth, M.P., the Deputy-Chairman, stating that in the opinion of the Standing Committee, this proposed appointment, if agreed to, would and ought to constitute a continuing service, and that it would carry all Mr. De la Hooke's pension rights, rights derived from the terms of his appointment under the Metropolitan Board, and which were quite unaffected by the anti-pension resolution before referred to), the Committee's recommendations were adopted by a large majority, and Mr. De la Hooke briefly returned thanks for his election.

*The Shortlands and Nunhead Railway Bill.*—The Parliamentary Committee reported against this Bill, which relates to a new railway intended to serve as an alternative route for the main line through traffic on the London, Chatham, & Dover Railway between Shortlands and London. At present this traffic, which is stated to be on the increase, has all to go via Dulwich, Sydenham-hill, and Penge. There is a long tunnel between the two last-named stations, in which, it is asserted by the promoters of the Bill, cannot be widened without inordinate outlay and some danger to life and property. A Committee of the House of Commons, having heard the evidence of the Chairman of the London, Chatham, and Dover Railway Company, has passed the preamble of the Bill, but the Parliamentary Committee of the Council have recommended "that the Bill be opposed, and that a petition against the preamble be sealed, and presented to the House of Lords." This recommendation was opposed by, amongst others, Councillors Brereton and Hughes, Colonel Hughes, as a Member of Parliament, giving it as his deliberate opinion (in which Councillor Lawson, M.P., agreed) that the opposition of the Council would be futile. The gallant colonel said he knew the

locality well, and was sure that the proposed railway would be a boon to it. This was too much for Councillor Acworth, who is an authority on English railways, as his book, recently reviewed in our pages, testifies. Colonel Hughes, said Mr. Acworth, "might know the locality well, but he evidently did not know the London, Chatham, and Dover Railway well, or he could never say that one of its lines would be a boon." Ultimately, the Committee's recommendation to oppose the Bill in the House of Lords was agreed to.

After transacting some other business, but leaving a great deal more unfinished, the Council adjourned until Friday, May 31.

#### ARBITRATION CASE: CLAIM FOR DILAPIDATIONS.

VISCOUNT GORT AND ANOTHER v. COOPER.

THIS was a claim for £288 for dilapidations upon eleven small houses situated in Tudor-place, Tottenham-court-road, under the original lease of sixty-one years, which expired at Midsummer last. It was heard in the Royal Courts of Justice on May 6, 7, and 14, before W. H. Verey, Esq., Official Referee.

Mr. William Wills (instructed by Messrs. Walford) appeared for the plaintiff, and Mr. J. Lawson Walton (instructed by Mr. Clarence Beckford) for the defendant.

The defendant, on the advice of his surveyor, Mr. Sextus Dyball, paid 150*l.* into court, in satisfaction of the claim, which was made under a covenant to "well and sufficiently repair, uphold, support, sustain, maintain, glass, pave, purge, scour, cleanse, empty, amend, and keep the said messuage or tenements and premises, and all brick walls, privies, sinks, sewers, wydraughts, drains, water-courses, and pavements, with all manner of needful and necessary reparations, cleansings, scourings, and amendments whatsoever."

It appeared that in March, 1887, the plaintiff's solicitors served defendant with a notice to repair, setting forth certain works required, and that defendant obtained estimates for carrying out these works, and accepted one amounting to 244*l.*; but as in the meantime he was negotiating for a renewal of the lease, the execution of the work was suspended. The negotiations having fallen through, defendant put the work in hand, and the greater part was done; but he was unable to complete the whole before the expiration of the term, and permission to do so afterwards was refused.

The defendant was then served with a schedule and claim for dilapidations amounting to 308*l.* 4*s.* 6*d.*, which had been prepared by Mr. Robert Reid; but, according to the defendant, this schedule included a certain proportion of the work which was comprised in the first notice to repair (the greater part of which he alleged had been executed), as well as much for which he disclaimed liability under the covenant in the lease. This was represented to Mr. Reid and to Messrs. Walford, but credit only to the amount of 181*l.* 4*s.* 6*d.* was allowed in respect thereof, reducing the claim to the sum sued for (288*l.*).

Mr. Robert Reid and Mr. Fend (architect and surveyor) gave evidence in support of the claim, based upon their interpretation of the covenant in the lease, which amounted, they held, to a literal performance, without regard to the character of the property or to the length of the term.

Mr. Sextus Dyball and Mr. James Tolley (architect and surveyor) contended, on behalf of the defendant, that a general covenant to repair is satisfied by the lessee keeping the premises in substantial repair,—*i.e.*, wind and water tight,—and that a literal performance of the covenant is not required. Diminution in value resulting from the operation of time falls, they submitted, upon the lessor, the lessee having only to take care that the premises do not suffer more damage than natural causes would effect. And they further held that the lessee was not bound to repair with new materials, and that he was liable only for such work as was necessary to keep the property as nearly as possible in the condition in which it might reasonably be expected to be after sixty-one years' wear.

Mr. Verey has since given judgment, with costs, in favour of the defendant on all the issues of the case.—(Communicated.)

#### WHAT IS A NEW STREET?

A CASE of some importance was decided on the 23rd ult., before Mr. Cooke, Magistrate, at the Marylebone Police-court. Messrs. C. & A. Daw & Son, 27, Palace-gate, Kensington, were summoned by the Solicitor to the London County Council for that, in the month of March last, at Farnwood-gardens, Bayswater-road, he "did unlawfully form or lay out a certain road, passage, or way for building as a street for carriage traffic without being open at both ends from the ground upwards, contrary to the 18 & 19 Vic., cap. 120, and 25 and 26 Vic., cap. 102, and by-laws. There was a second summons for causing to be erected certain "posts, rails, fences, bars, obstructions, or encroachments in,



upon, or over" Forwood-gardens in such a manner as to impede and hinder the traffic for which the street was formed.

Mr. Barton, from the Solicitor's office, was for the prosecution, and Mr. Glen, barrister, defended.

The site in question was that on which the historic Shaftesbury House, Bayswater-road, once stood, and which is now being built upon. The evidence of Mr. Millwood, surveyor, was that in the July of 1886, Messrs. Daw & Son applied to the Metropolitan Board of Works for leave to lay out the site and build thereon, at the same time submitting plans. Those plans, which showed two clear entrances to the road, were approved of by the Board on Nov. 12, the condition being that no obstruction was to be put up. On Nov. 19 Messrs. Daw & Son made a further application, and sent in altered plans, and both these were refused. In August last Mr. Millwood examined the estate, and found the old wall and gate at the Moscow-road end still standing, as was also the old wall in the Bayswater-road. But inside the latter, and on either side of a new road which had been laid out, buildings were in course of erection. In March of this year this was again visited, and it was discovered that at the Bayswater-road end of the estate, and within the old boundary wall, two brick piers, on which it is intended to hang gates, had been erected across the roadway of Forwood-gardens, thus reducing the 60 ft. roadway at that point to a considerable extent. Houses had been built on both sides of the roadway.

The defence, argued at great length, was that the estate was private land, and although accessible for those residing there, was not thrown open to the public, and that, therefore, the owner was not bound by the judgment of the Metropolitan Board of Works or the London County Council, but could do as he pleased. The case had been adjourned for Mr. Cooke to view the site, and he now gave judgment.

Mr. Cooke said the facts were hardly disputed. The defendant wishing to lay out a street for building purposes, applied to the Metropolitan Board of Works for leave, and deposited plans which would never have been accepted if it had been known what the defendants intended doing as to the construction at the entrances. A second set of plans was submitted to the Board, but they were rejected as contravening the following By-law of the Board:—"Every new street shall, unless the Metropolitan Board of Works otherwise consent in writing, have at the least two entrances of the full width of such street, and shall be open from the ground upwards," as it proposed to place gates or some kind of erection, so reducing the width of the roadway and interfering with the street, which was to be 40 ft. wide and open from the ground upwards. Mr. De Rutzen had had the case before him last year, and as he found that the end of the road leading into Moscow-road was simply obstructed by a hoarding, or structure of a temporary character, he dismissed the summons, as it was not clear what was the intention of the defendants. The position of the case was now entirely altered. Permanent erections had been made at the Bayswater-road end of the new street in the centre of the roadway, thus limiting the carriage-way to a width of about 27 ft., whereas it should be 60 ft. In addition, there were erections on each of the pavements on either side which clearly contravened the By-law requiring that the street should be open from the ground upwards to the full extent of the street itself, which was some 60 ft. Without giving any decision as regards the Moscow-road end, he should find that Forwood-gardens was a "new street," and that when dedicated to the use of the public, the carriage-way would not be 40 ft. wide, owing to the erections which had been built, and that it was not open from the ground upwards the whole width of the street. He could have wished that the defendants had made a further application to the Board of Works, but as his decision had been asked for, he convicted the defendants in a penalty of 40s. He at the same time stated that if there was any appeal he should be ready to state a case.

#### THE R.I.B.A. STANDING COMMITTEES.

SIR,—I am strongly of opinion that in addition to the existing Standing Committees of the Royal Institute,—namely, those of Science, Art, Literature, and Practice,—there should be, for the purpose of regulating and exercising judicious control over the multifarious legal enactments which affect the profession of architecture, a properly-constituted Law and Parliamentary Committee. The laws affecting architects and architecture are constantly undergoing change,—and, indeed, require to be materially changed;—and it is absolutely essential that in all such changes the Royal Institute, recognising its political position, and pursuing an active policy, should direct these desirable innovations into channels which may be found most beneficial to architecture; secondly, to the profession of architecture; and ultimately and consequently to the public. Upon a resolution passed some two months since

by the Kensington Vestry, that the working of the existing Public Health Act, the Sanitary and other cognate Acts should be referred to and reported upon by one of the Standing Committees, the matter was referred by the Committee to both the medical officer and parish surveyor to submit their respective reports upon the questions and Acts of Parliament involved. The suggestions made both by the medical officer and surveyor have been unanimously adopted by a resolution of a general meeting of the Vestry; and with a view to carry them into effect the Vestry have memorialised or petitioned the London County Council with a view to their adoption by amending the existing laws. One of the suggestions contained in the Surveyor's report is a matter which is closely allied to and sensibly affects the architectural profession, to the effect "That the present dual system of supervising the erection of buildings within the metropolis, by the District Surveyors, being attached to the County Council, who supervise the constructional portion of the work; and the sanitary engineers (:) attached to the various Vestries who supervise the drainage (:) is unnecessarily cumbersome and expensive."

The whole tone and tendency of the suggestion is that District Surveyors, like the Vestry sanitary engineers, should not be attached directly to the Royal Institute, which is very desirable; but be under the thumb of Vestrydom. Now it occurs to me that the Institute, acting through the Practice Committee in conjunction with a Law and Parliamentary Committee—to be formed—might exercise a controlling voice and influence in all such changes of the law, to the material advantage of the whole profession. This is self-evident; and further, the very first change which is both necessary and pressing, which the Law and Parliamentary Committee could immediately enter upon, would be a complete revision and consolidation of the whole of the Metropolitan Building Acts, and their Amendment Acts, to the immense satisfaction of architects, builders, clients, and certainly of District Surveyors themselves.

CHAS. R. GUY HALL.

#### "NOTES ON BUILDING CONSTRUCTION."

##### PART III. (MATERIALS), 2ND EDITION.

SIR,—I regret to find from your leading article of the 26th May that there are so many mistakes in the references to pages in the above-mentioned volume.

May I ask you to give me the opportunity of saying that in the course of a few days a table of *errata* shall be printed and sent to every one who applies to Messrs. Rivington for a copy?

I thank you for this and other kindly notices of my book, and may mention that want of space compelled me to restrict myself rigidly to the actual materials used in this country, and to exclude American and other experiments which do not refer directly to those materials.

THE AUTHOR OF  
"NOTES ON BUILDING CONSTRUCTION."

#### TRIANGULATION THEORY.

SIR,—The use of the term "Triangulation Theory," to denote the system supposed to have been used by the old architects for the setting-out of the proportions of their buildings, is calculated, I fear, to mislead, and to bring discredit upon the "Geometric Principles" which were undoubtedly employed by them. It may not be easy to discover anew, from existing remains, the exact application of the principles employed in their structures under an elaborate system; and Mr. A. B. Pite may well be excused his non-discovery of any principle when testing solely with the equilateral triangle. This figure was rightly held in estimation by the mystics and symbolists of those days, and its proportions were often used. This, however, was but one small item of the manifold resources at their disposal in the vast geometric principle which was within the reach of the old architects, and which was carried out by them to an extent which no doubt would astonish many who cavil at the theory. The equilateral triangle, as distinguished from other figures, would probably possess no special charm for the setting-out of proportions in which the actual presence of the triangle would not be applicable; and it was the whole system of applied geometry which readily enabled them to bring within harmonious relations the various elements of length, and breadth, and height. In this way the unpleasing and commonplace proportions,—for instance, of exact halves, quarters, and thirds,—were absolutely and necessarily avoided. Amongst other

figures used were the diagonals of squares and tangents of arcs struck upon the same, and I will defy any one to disprove the practical application of problems which I have worked out,\* showing how accurately the proportions of the plans of some of the earlier churches were determined prior to the great development which subsequently took place, when all the details of *graduated* widths and heights of windows and other openings were with equal accuracy laid down. They are such as to preclude the possibility of their being accidental on the one hand, or the result of a fine intuitive perception of proportion on the other. They pervade the works of various men, at various epochs, and in various localities. Whether or not, in some instances, merely imitative work was carried out, as at the present day, to the disregard of principles thus scientifically deduced, may, of course, be open to question. It is, for me, enough to assert, as I do with the greatest confidence, and will maintain "at the point of the lance," that the best and noblest of the earlier works were thus developed. Proportions which have relations to one another, and have relations to one another also; and hence, if length and breadth are in some definite and harmonious relation to one another, the further dimension of height can easily be made so by following similar relation, whether to the cross or to the long section. I am glad to see that Mr. Blow does not consider it beneath the notice of a Travelling Student of the Architectural Association to take up what has been considered by the great mass of modern architects as an effect and exploded theory. WILLIAM WHITE.

30a, Wimpole-street, May 28, 1889.

SIR,—I am sorry that I must disclaim the remarks attributed to me in your report of the Architectural Association meeting on the 17th inst., but, not being present at all, it is obvious that they fell from the lips of a namesake of mine, to whom this explanation is fairly due, though I heartily agree with him. A. NEDHAM WILSON.

Brockley, S.E., May 24, 1889.

[We regret the mistake, though we are glad that no harm has resulted from it. The name mentioned in our report was that given to the reporters, who cannot be expected to be able to identify every one of the thousand (and more) members of the Association.]

#### STAINED GLASS.

Aston, Cheshire.—The Talbot Memorial, subscribed for by the tenants of the Aston Estates, has taken the form of a large painted window, with the subject of "Our Lord healing the sick" introduced. The window is from the studio of Messrs. Charles Evans & Co., London. The subject consists of eleven figures nearly life-size, the ornamental surroundings being classic in treatment, harmonising with the architectural details of the church.

Leighland Church, Washford.—The east window of this church has recently been filled with stained glass. The window is of three lights, and contains a representation of the Ascension of our Lord, under architectural canopies, in keeping with the style of the church. Messrs. Warrington, of London, were the artists employed.

Wandsworth.—Messrs. Charles Evans & Co. have recently erected a painted memorial window in the Church of St. Stephen, Wandsworth, to perpetuate the memory of Henry Davidson, who died in Malaga. The window is the gift of General Davidson.

The English Iron Trade.—The English iron market, taking it all round, is quieter. Pig-iron is weaker in the North of England and Scotland, but very steady,—and even firm,—in Lancashire, Staffordshire, and Worcestershire. Scotch warrants have declined on the week, and makers' iron is easier. Some Cleveland makers are approaching more nearly to merchants' prices, and quote No. 3 Middlebrough 1s. a ton lower, at 39s., but most of them still hold to 40s. Bessemer iron has lost 6d. a ton in the north-west. The finished iron trade continues fairly active, and there are no perceptible changes in rates, the market in Lancashire and Staffordshire continuing strong in tone. Welsh bars have dropped 2s. 6d. a ton. Tin-plates are quieter. Steel is the least affected, and remains in good demand and firm in price. Shipbuilders are as busy as before, and the engineering trade is still brisk.—Iron.

Spanish Exhibition.—We understand that Mr. Thomas W. Cutler, F.R.I.B.A., is retained as consulting architect to this exhibition.

\* Our correspondent's ideas of logic seem rather defective. The *onus probandi* lies with him; he cannot call on his opponent to prove a negative.—Ed.



## The Student's Column.

## TOWN DRAINAGE.

## XXII.—WATER-SERVICE TO HOUSE-FITTINGS.

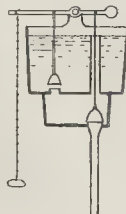
THE water-pipe laid into a house from the street main is now mostly  $\frac{3}{4}$  in. internal diameter, but it varies in different towns, and sometimes in different parts of the same town, according to the height of the service reservoir and pressure of water. The weight of the pipe per yard also varies with the pressure of water in the mains, a "light" pipe  $\frac{3}{4}$  in. diameter being about  $3\frac{1}{2}$  lbs. per yard in length, a "strong" pipe  $\frac{1}{2}$  lbs., and an "extra strong" pipe 6 lbs. per yard. The plumber is in this matter and a few others controlled by the regulations of the water authority, whether it be a company of proprietors or the public authority of the town. The water-supply pipe within the house and its premises is the service-pipe. The short length between the street main and the house, or the outermost part of the premises, is the communication pipe, at the end of which and commencement of the service pipe a stop-cock is placed, which is under the control of the water authority. The turncock can here, by coming in the dead of night when no water is being drawn, close the water-taps are left open, or other waste of water is going on. He does this by the sense of hearing, placing his iron bar upon the stop-cock. Leaving a tap open wastes water to a serious extent, while it is not an economical means of keeping the drains clear. A tap running four gallons in a minute wastes a whole day's supply in half an hour, while the continuous run of so small a stream of water through the drain removes but little deposit, supposing there to be any.

But there may still be waste of water, with every intention to avoid it by shutting all taps as soon as the water has been drawn, or when it is drawn through self-closing taps, for the end of the supply-pipe to the cistern is fitted with a self-acting valve, opened and shut by a lever, at the end of which is a floating ball of copper, which rises with the water in the cistern until it is full, falling again and opening the valve when the water sinks. Whether the ball-cock does not act properly, the water continues to rise to the level of the overflow-pipe and runs to waste. This overflow-pipe has often caused trouble by conducting foul air from the drain into the cistern, contaminating the water and spreading into the house, notwithstanding that a trap was placed in the pipe, for, as the water did not often overflow and replenish the trap, that with which it was filled evaporated and left the trap open. Every overflow-pipe of a cistern is now taken through the outside wall, and is left with an open end, so that if the ball-cock is not acting properly and there is an overflow of water from the cistern, it is seen, and the plumber is sent for, thus serving a doubly useful purpose,—warning against waste of water and preventing foul air entering the house through the overflow-pipe. In a similar manner foul air is sometimes conducted into a house through the overflow-pipe of a safe-trap under a water-closet basin. By the carelessness of house servants things are thrown into the basin of a water-closet which will not pass through the trap. These may not at once stop the outlet, but their presence causes an accumulation which soon does so, and, notwithstanding that the basin may be properly provided with an overflow, the opening of the valve causes the water to overflow the basin. To catch such an overflow a lead trap used to be, and is still often, placed under the basin, extending beyond its circumference all round, the edges being turned up.\* From this "safe" a pipe carries off the water into the soil-pipe, and should, of course, be trapped, either by entering the main trap below its water-level, or, if it enter the soil-pipe, having a separate trap. But with a separate trap there is the same objection as there is to a trap on the overflow-pipe of a water-cistern,—that the water evaporates and leaves the trap open; and if the overflow of the basin arises from the stoppage of the main trap, the pipe from the safe to the trap becomes useless. These safe-traps are only laid on floors which have a ceiling underneath, where the damage by such an overflow of water may be more than the cost of the safe; and when they are fixed the overflow-pipe should be taken through an outside wall in the manner already mentioned,

the end of which may have a light copper flap to prevent back-draught of air.

Cisterns are distinguished as storage and service cisterns. They are, on the smallest scale, what reservoirs of gravitation waterworks are on the largest; one for storage, another for service. A storage reservoir receives the intermittent supply of rain-water, and enables an average quantity to be transferred daily throughout the year to the service reservoir, whence the water proceeds directly to the town for use. In a similar way, when the supply of water to houses is not constant, day and night,—that is, when it is supplied intermittently, as in some parts of London, during a few hours of the day only,—a storage cistern is necessary in a house, from which the service-cisterns may be supplied at all times, the storage cistern holding 24 hours' supply, while the service cistern, or regulating box, of a water-closet supply holds only a few gallons. Taps from which water is drawn for every other purpose than that of supplying water-closets and urinals are connected through pipes with the storage cistern only, while the supplies to those fittings just mentioned are derived from the service cisterns only, there being no direct connexion between these and the main cistern from which the house-taps are supplied. When the supply of water in a town is constant, storage cisterns in houses are not required: water is drawn direct from the pipes which are connected with the street-main; but in all cases, whether the water-supply be on the constant or the intermittent system, separate small cisterns are required for the fittings; and as they are so small they are more often called service-boxes, and are often of cast-iron, in one piece, or at most in two. Each one has two compartments, one of which is large enough for the movement of the ball-lever of the valve through which it is supplied with water, either direct from the house-service pipe or from the storage cistern, the other compartment being the regulating box holding two gallons or other quantity allowed by the regulations, and from which the water is directly supplied to the fitting. If this be supplied through a valve on the pipe near its lower end, the service-box need not necessarily be directly over it, although it is better for being so; but if the fitting be a flush-out or wash-out closet-basin, the service-box should be directly over it at a height of not less than 4 ft., and the pipe from it should be of such size as to discharge the water into the basin instantly: if the pipe offer an obstruction to the flow of water through it, by being either too small in diameter or too long, the desired effect of the supply of water is not obtained:  $1\frac{1}{2}$  in. is the least internal diameter for this pipe, and the proper size varies from that to 2 in. in different situations. On the one hand, height above the basin is necessary to give velocity to the water, while, on the other hand, the supply should be brought near to it, so as to act as instantaneously as possible on the valve being opened. Combining these two requirements, a height of 5 ft. with a pipe  $1\frac{1}{2}$  in. internal diameter give the best results. But the proper size of pipe may be put in and yet not discharge the water satisfactorily. This will be so unless the mouth of the pipe in the cistern be sufficiently large to contain a valve which has a clear waterway of sufficient area to give effect to the capacity of the pipe for discharging the due quantity of water. Two gallons of water should be discharged in four seconds with a  $1\frac{1}{2}$ -in. pipe, or in five seconds with a  $1\frac{1}{4}$ -in. pipe. The form of waste-preventing cistern which has been, perhaps, more in use than any other is that of the double valve, in which the second compartment, supplied from the first, holds the stipulated quantity of water, usually two gallons; a quantity, however, too small to ensure effectual flushing in many cases; it should be three gallons for safety. The two valves are connected to one lever, one on each side of the centre on which it turns, so that when one of the valves is opened the other is closed. One end of the lever is weighted; the other is pulled down to discharge the water, as in the figure. The secondary or measuring compartment is sometimes placed alongside the other one, but more often underneath it. This form of cistern is all that is required for a flush-out closet-basin; and in this category must be included, besides the improved form called properly the wash-out, previously shown in sketch 4, the common hopper or similarly-formed basin, which has its outlet at the bottom, and is connected immediately with the trap. Some other kinds

require that the cistern be so formed as to give an "after-flush," but not these.



With regard to the common form of basin, there is sometimes a flange round its outlet, bedded in putty on the socket of the trap beneath it, and there is also sometimes a flange on the outlet of the trap, similarly bedded; but this is a mistake, inasmuch as it prevents the joint being made effectually. It covers the joint and looks well enough outside, but it is impossible to caulk the joint, or to make it air-tight in any other way, with this projecting flange.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

## 8,470, Latches. C. Young.

The latch-bolt which is the subject of this patent is provided at the back end with a roller, against which the spring bears. In the mortice of the latch-bolt is fitted a pin, carrying a roller. Against this pin and roller is a double-armed lever, terminating in a knob or handle. Similar mechanism is provided on each side of the doorway. To open the door from the inside the handle is pulled away from the door; and to open the door from the outside the handle is pushed against the door. The invention is applicable to doors for dwelling-houses, and for shops, safes, cupboards, bookcases, case-ment-windows, &c.

## 8,879, Mixing and Making Cement. T. C. Fawcett and T. Castle.

The chief improvements which are the subject of this invention are connected with the machinery for mixing the materials for cement-making. The bottom of the pug-mill pan is perforated, and the mixture, when properly ground, is passed to other mills, and treated in the manner usual in making cement.

## 1,363, Improvements in Water-closets. J. Clayton and C. Tindall.

In tipping-closets, according to this invention, the basin is made shallow, and the tipper is actuated outside the basin, with its tipping and opposite to it. The tipper acts automatically when nearly full of water, the flush carrying everything over the shallow surface of the basin to an  $\Omega$  or  $\Gamma$  trap, from which it is discharged to the main drain by the next flush. The water-line in the trap is several inches below that in the basin, to lighten the force of the flush. The chamber in which the tipper is mounted, and the basin, may be made all of one piece.

## 4,395, Ventilating Apparatus. B. Von Busse (Berlin).

This invention relates to an improved system of ventilating the hollow space underneath the floors in houses and other buildings, whereby dampness and also the formation of fungi is prevented. In winter, too, by this arrangement, it is possible to utilise the heated air of rooms for the ventilation, preventing the coldness which proceeds from the hollow space underneath the flooring. The apparatus consists of a three-armed tube, opening severally (1) into the space to be ventilated, (2) into the space above the floor, and (3) into the open air, with means of shutting off at will communication between the arms. An extra tube is fitted to one of the arms, to be used in telescope fashion, to make the combined apparatus fit the varying thicknesses of wall.

## 8,945, Earth or Dry Closets. B. Shillito.

According to this invention a pivoted scoop or measure is combined with a hopper or hoppers to hold the earth, disinfectant, or deodoriser, and is arranged so as to measure out any desired quantity. When the slide is actuated it pushes the measure from beneath the mouth of the hopper and passes into its place, thus closing it as well as pushing the measure off the ends of its support, and allowing it to swing down on its pivot and shoot its contents into the excreta pan. Reversing the motion draws back the empty measure to its original position beneath the hopper, and it is again filled.

## 9,054, Chimney Head or Pot. W. Peyton.

The chimney-pot which is the subject of this patent is made of burnt clay in the shape of a pipe, having on the outside, just above the base, a series of trumpet-shaped holes or inlets, continued by tubes constructed in the thickness of the pipe in an

\* With the modern form of pedestal-closet, where everything is in view, these lead safes are not requisite.



upward direction for about half its height, and finishing with orifices on the inside of the pipe. The chimney is easily swept and down-draught prevented.

#### 9,317, Fastenings for Casement Windows. R. J. Stephens.

The improvement which is the subject of this patent consists in utilising the rod or bar, loosely pivoted in most forms of casement-fastenings, for the double purpose of opening the casement and acting as a fastener when it is closed. The improved fastener is fixed half-way up the casement, instead of at the bottom, and is so arranged that when the casement is closed the projecting bar or rod falls in a vertical position and forms a secure fastener. This is effected by having a joint in the rod near the point where it has passed through the bracket attached to the window-frame. The fastener, being fixed in the centre of the casement, prevents rattling and vibration.

#### 14,127, Hooks, Staples, and Hook-headed Nails. H. Lilley (Philadelphia).

This invention refers to a method of forming "pipe-hooks," used by gasfitters in fixing pipe, or hook-headed nails out of stamped sheet-metal blanks. The blank being compressed between suitable dies is strengthened in the shoulder, where strength is most needed.

#### 4,186, Attachment for Grates. J. H. Wait.

This invention, which is of American origin, consists of a series of the old-fashioned "footman," with grooves in the bars, and hooks by which it may be hung on to the front bars of the grate.

#### 4,856, Flue Ventilator. G. Connell.

According to this invention, a box or frame with divisions forming chambers, and flaps for regulating the direction of the air, is fixed in the flue, and by means of peculiar-shaped baffle-plates the air is made to take a descending direction before entering the flue. The baffle-plates becoming heated, the air is assisted afterward in its ascent, and the air is also more readily drawn into the flue from the apartment.

#### 5,076, Window-sash Fasteners. F. Fry.

The fastener which is the subject of this patent, unlike many others, requires both hands to open it, and this is thought to be an advantage in the case of nefarious attempts to open it from the outside. A hinged cover-plate folds over the fastening-bar, which cannot be withdrawn until the plate is first lifted.

#### NEW APPLICATIONS FOR PATENTS.

May 6.—7,525, S. and W. Dearden, Stone-cutting or Sawing Machinery.—7,537, W. Congreve and R. Brownwood, Dry-earth Closets.—7,567, A. Caudle, Burglar-alarm and Sash-locks.—7,583, J. Lancaster, Lathing.

May 7.—7,592, A. Hogan, Plasterers' Lath.—7,593, A. Hogan, Preventing the Bursting of Water-pipes by Frost.—7,650, H. Whitehouse and J. Clifford, Floor-springs for Swing-doors.—7,652, C. Butcher, Kitchen Ranges.

May 8.—7,696, C. Young, Mortice Locks and Latches.

May 9.—7,776, S. Worthington, Self-supporting Concrete Casing Iron or Timber Brackets.—7,790, A. Cassard, Portable Water-closets.

May 10.—7,837, W. Byatt, Bunk-board Latch or Bolt.—7,840, B. Boshier, Guide to Fitters and Carpenters' Compasses.—7,853, W. Syer and W. Clark, Ventilating.

May 11.—7,881, N. Denny, Anti-fouling Paint.—7,898, H. Diggins, Dust-bins.—7,899, H. Price, Sanitary Dust-bins.—7,903, J. Lewis, Hooks or Supports for Rain-water, Drain Pipes, &c.—7,908, T. Kennedy, Attaching Door Knobs or Handles to their Spindles.—7,913, S. Hindley and G. McKenzie, Cement for Joining Wood, Stone, &c.

May 13.—7,918, J. Charlton and R. Hodges, Fastenings and Latches for Door-handles.—7,924, G. Smith, Ventilating Sewers.

May 14.—7,988, M. Farrell, Window Catch or Fastener.—8,019, W. Macdonald, Ventilation Adaptable to Existing Sash-windows.—8,033, W. Abell and J. Watling, Tip Vans or Wagons.—8,051, W. Scott, Cut Sponge to be used in place of Flock for Wall papers and Decorations.—8,060, J. Maw, Metallic Lathing.

May 15.—8,101, O. Bellamy, Water-cistern.—8,111, W. Hassall, Fireplaces for Brick-kilns, &c.—8,114, T. Bate, Water-closets.

May 16.—8,129, S. Ingham and others, Parquet.—8,132, B. Cordingley, Plug-cocks for Lavatories, &c.—8,162, J. Rome, Metallic Trough Flooring for Bridges, &c.—8,182, J. Burford, Fireplaces.—8,183, J. Wade, Warming and Ventilating Rooms, Houses, &c.—8,185, L. Follansbee, Traps for Baths, Water-closets, &c.

May 17.—8,199, F. Martin, Shop Fittings.—8,201, W. Allenby, Retaining Sash-windows at any height.—8,225, S. Smith, Cottage Ranges.—8,233, J. McLaws, Wood-working Machines.

May 18.—8,272, H. Brookfield, Flushing Water-closets, Drains, &c.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

2,882, J. Millar, Combined Bath and Lavatory Basin.—4,253, F. Hayward, Wedge-block to keep Fastenings rigid on Roofs.—4,524, C. Shewbrooks,

Roof coverings.—4,683, H. Ellis, Fireproof Wall and Ceiling Papers and Coverings.—4,913, C. Elliott, Glazing and Fixing Metal Sheets to Roofs, &c.—4,958, W. Lindsay, Glazed Structures and Sash-bars for same.—5,266, H. Knowles, Fastenings for Window-sashes, &c.—5,756, J. Macnaughton, Window-sashes and Doors.—6,157, T. Prentice, Raising and Lowering Window-sashes.—6,310, J. Gibson, Tombstones, Monuments, &c.—6,394, G. Ewart and others, Metal Roofing.—6,433, W. Schlenker, Application of the Residues of Soda for Building Purposes.—6,447, F. Coulsell and others, Wood-block Flooring.—6,536, H. de Lespaze and W. Sra-to, Plaster.—6,555, H. Allan, Kitchen Ranges.—6,603, I. Sergrinson and J. Noble, Chimney-cowl.—6,637, R. Kenny, Plug for Drain-pipes, &c.—6,915, G. Ewart and others, Metal Roofing.—6,995, C. Reeve and J. Hands, Window and Door Locking Fasteners.—5,312, T. Tutin, Chimney-top.—5,368, H. Kent, Disinfecting Pan.—5,370, C. Nixon, Chimney-tops.—5,952, E. Allen, Construction of Dwellings for the Poor.—5,989, T. Graham, Setting of Light at any Angle.—6,179, J. Simpson, Raising, Lowering, and Sustaining in Position Window-sashes.—6,245, J. Howie, Syphon Cisterns.—6,293, D. Hildersley, Flush Cisterns for Water-closets, &c.—6,507, R. Evered, Door and other Bolts.—6,543, H. Algar, Locking Sliding Sashes, &c.—6,760, J. Sizer, Firegrates or Stoves.—6,815, R. Melvor and others, Whitelead.—7,051, A. Washington, Paint.—7,154, J. Thorne, Whitelead.—7,156, J. Macfarlane, Yellow Pigments.—7,164, J. Kimm, Chimney-pot.—7,244, G. Hone, Chamfering Planes.—7,318, W. Vase, Slow-combustion Stoves.

#### COMPLETE SPECIFICATIONS ACCEPTED.

#### Open to Opposition for Two Months.

7,182, W. Goodchild, Bolts for Coach-horse and Heavy Doors.—7,225, J. Hird and J. Ford, Fittings for Casements, Sash-windows, &c.—8,485, R. Mansmann, Fireproof Columns.—8,553, J. Ogerby and J. Lea, Chimney-tops.—9,050, J. Neild, Ladder Bracket.—9,685, E. Foakes, Excavating Machinery.—17,372, G. Stephan, Movable Timber-sawing Machines.—18,308, J. Abel, Automatic Door-closer.—3,872, L. Cadwell, Pavement Blocks.—11,796, D. O'Halloran, Bell-pulls.—12,896, J. Gerhold, False Bucks for Firegrates.—15,557, J. Kinneir, Metallic Collages.—16,729, F. Stokes, Finger-plates for Doors.—1,613, A. Stevenson, Window Ventilation.

#### RECENT SALES OF PROPERTY:

#### ESTATE EXCHANGE REPORT.

MAY 16.—By P. D. TUCKER & CO.  
Upton Park—Ninety-one plots of 1 a. .... £3,434

MAY 20.—By J. A. EGGER.  
New River Company—One-half of a King's Moisy 42,270

Notting Hill—13, 16 and 18 St. George's-rd., u.t. 62 yrs., g.r. £11. 10s. r. £97 p.a. .... 710

Shepherd's Bush—137 to 181 (odd), Blythe-rd., u.t. 87 yrs., g.r. £113. 11s. r. £245 p.a. .... 3,550

Thornton Heath—4, 6, 8 and 10, Brighton-rd., f., r. £220 p.a. .... 3,625

Fulham—F.g.r. of £40, with reversion in 98 yrs. to r. of £200 p.a. .... 930

City of London—35, Fenchurch-rd., 30 yrs., g.r. £310. r. £1,618 p.a. .... 8,000

Bromley—"Church House" and 6½ acres, f. .... 7,100

Brentwood—"North End House" and 4s. 0l. 16p., f. 1,800

Higbgate—81, Dartmouth-pk.-hill, u.t. 63 yrs., g.r. £10 .... 1,250

Regent's Park, York-terrace—Stabling, u.t. 32 yrs., g.r. £5, r. £30 p.a. .... 1,800

The adjoining block, u.t. 32 yrs., g.r. £5, r. £30 p.a. .... 770

The adjoining two blocks, u.t. 32 yrs., g.r. £10, r. £216 p.a. .... 1,745

Camden Town—13, Eversholt-rd., u.t. 64 yrs., g.r. £7, r. £50 p.a. .... 625

12, 13, 14, and 15, Eversholt-rd., u.t. 64 yrs., g.r. £7, r. £50 p.a. .... 625

26, Eversholt-rd., u.t. 64 yrs., g.r. £7, r. £50 p.a. .... 625

By HAMPTON & SONS.  
Ealing—8, Sandringham-gdns., u.t. 75 yrs., g.r. £10 .... 1,155

By G. STONEGROVES.  
Strand—8, York-hill, f., r. £20 p.a. .... 1,110

Bloomsbury—27, Brunswick-sq., u.t. 5 yrs., g.r. £23. 12s. 6d., r. £100 p.a. .... 100

Upper Tollymore-pk.—No. 62, u.t. 86 yrs., g.r. £28, r. £10 p.a. .... 480

By A. SPAIN & SONS.  
Peckham—20 to 22 (even), Clayton-rd., u.t. 67 yrs., g.r. £20 .... 1,410

Eudford, Chesham-green-avenue—"Virgennes" u.t. 83 yrs., g.r. £10. 10s. r. £40 p.a. .... 490

Byculla-avenue—"The Mews," f., unfinished .... 490

Stratford—1 to 5, Edith-rd., u.t. 68 yrs., g.r. £10. 10s. r. £25 p.a. .... 400

By TREVAGNO & MARTIN.  
Notting-hill—"Norland Chapel" and 172a. 3r. 56p. f. .... 10,600

Two plots f. land, 11s. 2r. 21p. .... 976

The Pleasure Farm  
47a. Or. 20p. .... 8,600

Four enclosures of land, 4s. 2r. 6p. f. .... 2,610

Two freehold cottages. .... 480

By F. J. BISLEY.  
Kingston—Park Villa, f., r. £35 p.a. .... 880

Peckham—9 and 7, Trafalgar-sq., u.t. 84 yrs., g.r. £12. 4s. 15d. .... 495

Hermesbury—122, 124, and 126, Keston-rd., u.t. 57 yrs., g.r. £36. r. £97. 10s. p.a. .... 775

Southwark—21 to 26, Bath-st., u.t. 52 yrs., g.r. £27. r. £20. 6s. p.a. .... 1,550

Rotherhithe—1, Berkeley-rd., u.t. 65 yrs., g.r. £2. 5s. r. £26 p.a. .... 255

19 and 20, Hadland-st., u.t. 66 yrs., g.r. £4. 10s. r. £49. 8s. p.a. .... 425

MAY 23.—By REYNOLDS & EASON.  
Bethnal-green—F.g.r. of £25, reversion in 151 yrs. .... 215

36 to 46 (even), Green-st., f., r. £317 p.a. .... 3,070

13, 15, and 19, Winchester-st., f., r. £76. 14s. p.a. .... 735

87, 60, 63, and 69 (odd), Buxton-st., u.t. 66 yrs., g.r. £23. 12s. r. £23 p.a. .... 1,065

2 York-st., u.t. 3 yrs., g.r. nil, r. £28 p.a. .... 28

Old Ford—145, Armagh-rd., f., r. £26 p.a. .... 260

152, 144, and 146, Usher-rd., f., r. £65. 12s. p.a. .... 510

By G. G. STANHAM.  
Chelsea—441, King-rd., u.t. 67 yrs., g.r. £6, r. £32 p.a. .... 285

Hyde Park—42, Cambridge-st., u.t. 34 yrs., g.r. £8. 1s. r. £24 p.a. .... 900

Kentish Town—38, Weddington-rd., u.t. 51 yrs., g.r. £5. r. £28 p.a. .... 250

Hampstead-rd.—12, Robert-st., u.t. 32 yrs., g.r. £9. 1s. r. £24 p.a. .... 715

5, Robert-mews, u.t. 32 yrs., g.r. £2. r. £12 p.a. .... 180

43 and 80, Robert-st., u.t. 33 yrs., g.r. £11. 10s. 6d., r. £86 p.a. .... 1,040

MAY 25.—By A. WATSON.  
West Norwood—12, Court-rd., u.t. 80 yrs., g.r. £7, with possession .... 500

By WALTON & LEE.  
Uxerston—"Hill Foot House," and 21a. Or. 2p., l. Roshead Farm, and 83a. 1r. 29p. .... 3,000

By W. W. JARVIS.  
Clapham—"Lynton House," with grounds, f. .... 6,800

Kingland—34, 35, and 38, Stanley-rd., u.t. 62 yrs., g.r. £11. 6s. r. £113 p.a. .... 780

By DENNANT & CO.  
Balham—6, Larch-rd., f., with possession, f. .... 250

Holloway—6, Ingleby-rd., u.t. 60 yrs., g.r. £6, r. £33 p.a. .... 230

By C. C. & T. MOORS.  
Leytonstone, Harve-rd.—"Haughton House," f. .... 475

1, Lancaster-rd.—A plot of f. land .... 155

Stepney—23, 24, and 25, Smith-st., u.t. 25 yrs., g.r. £7. 10s. .... 490

By BRIANT & SON.  
Kennington Park-rd.—No. 318, u.t. 41 yrs., g.r. £5, r. £80 p.a. .... 680

Tulse-hill—No. 33 and 35, u.t. 40 yrs., g.r. £23. 10s. r. £135 p.a. .... 1,125

Ruston-rd.—L.g.r. of £21 p.a., term 17 yrs. .... 200

By PRICKEET, VENABLES, & CO.  
Hornsey—F.g.r. of £50, with reversion in 95 yrs. to r. of £500 p.a. .... 1,690

Eltham—F.g.r. of £102, with reversion in 77 yrs. to r. of £500 p.a. .... 2,536

F.g.r. of £23. 4s., with reversion in 77 yrs. to r. of £100 p.a. .... 579

Putney—F.g.r. of £35, with reversion in 79 yrs. to r. of £210 p.a. .... 985

By NEWBORN & HARDING.  
King's-cross—A, Averspold-pk., f., r. £35 p.a. .... 1,000

Hornsey—Harold-lane—A plot of f. land .... 250

96, Myddleton-rd., f., r. £24 p.a. .... 1,245

10, 30 to 38 (even), Harve-rd., f., r. £134 p.a. .... 1,385

40 to 50 (even), Harve-rd., f., r. £134 p.a. .... 1,385

Canonsbury-lane, Canonsbury-lane, 13 yrs., no g.r., r. £24 p.a. .... 210

Stoke Newington—44, Gordon-rd., u.t. 70 yrs., g.r. £8. 10s. r. £24 p.a. .... 290

Upper Norwood—1 and 3, Selwyn-st., u.t. 71 yrs., g.r. £12. r. £90 p.a. .... 420

By REYNOLDS & EASON.  
Homerton—F.g.r. £3. 3s., with reversion in 4 yrs. to £21 p.a. .... 205

60 and 62, Church-st., f., r. £87. 12s. p.a. .... 695

Stepney—73, Samuel-st., c. r. £23. 8s. p.a. .... 200

44, Ernest-st., f., r. £18. 4s. p.a. .... 150

Plaistead—1, 3, and 5, Church-st., f., r. £40 p.a. .... 295

Commercial-rd.—84 to 70 (even), Bromley-st., u.t. 18 yrs., g.r. £10. r. £37. 10s. .... 228

Bethnal-green—"The Cooper's Arms," u.t. 18 yrs., g.r. £5. r. £33 p.a. .... 300

Commercial-rd.—"The Mulberry-tree" p.h., f., r. £20 p.a. .... 1,600

Bethnal-green—1 and 3, Buxton-st., and "The Two Brewers" p.h., u.t. 44 yrs., g.r. £27. 10s. r. £124. 12s. .... 650

82, Jubilee-st. and a.l.g. of £4, u.t. 12 yrs., g.r. £3. r. £41. 10s. .... 100

138 and 140, Jubilee-st., u.t. 19 yrs., g.r. £28. r. £67 p.a. .... 365

1, Uxet-st., f., r. £28. 12s. .... 340

38, Derbyshire-st., f., r. £3. 4s. .... 350

91, Coventry-st., f., r. £314. 4s. .... 350

By A. RICHARDS (at Edmonton).  
Tottenham, Birkbeck-rd.—Two plots of f. land, .... 68

Lordskip-lane—A f. plot of land, .... 84

Dyson-pl.—Two houses, profit rent of £15 p.a. for 24 yrs. .... 30

F. cottage and outbuilding, r. £24 p.a. .... 250

Two cottages, f., r. £4. 4s. p.a. .... 110

Edmonton—12 and 14, Upper Ford-st., f., r. £50 p.a. .... 530

1 to 7, Eaton-pl., f., r. £16. 16s. p.a. .... 170

F. house, cottage, and p.h. .... 270

MAY 24.—By RICE BROS.  
Mile-end-rd.—F.g.r. of £50, with reversion to r. of £230 p.a. in 55 yrs. .... 1,080

By E. CHRISTIAN.  
Poplar—241 and 250, High-st., c. and f., r. £57 p.a. .... 670

St. George's-in-East—1 and 3, John-hill, f., r. £41 p.a. .... 100

1, 2, and 3, John-st., f., r. £31. 4s. .... 250

By WOODS & SKELLING.  
Brixton—338, Coldharbour-lane, u.t. 62 yrs., g.r. £4, r. £50 p.a. .... 665



|                                                                                    |       |
|------------------------------------------------------------------------------------|-------|
| By BAKER & SONS.                                                                   |       |
| Hazwell—1 to 5, Clifton villa, f. r. £39 p.a.                                      | 790   |
| Hornslow—1, 2, and 3, Gordon-st., f. r. £96 p.a.                                   | 695   |
| Enfield—F.g.r. of £52. 10s., with reversions in 93 yrs.                            | 1,115 |
| Gray's land—29, 30, and 31, Bowdler-st., u. t. 12 yrs., g.r. £3. 10s., r. £33 p.a. | 110   |
| Marlebone—1A, Allsopp-mews, u. t. 12 yrs., g. r. nil, f. £54 p.a.                  | 210   |
| Southend—10 and 11, Ashburnham-ter., u. t. 79 yrs., g.r. £4. 10s., r. £40 p.a.     | 555   |
| Harlesden—5, Bolton-road, f. r. £31 p.a.                                           | 300   |

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| By W. HALL.                                                                                                                                                                                                                                                                                                                                                                                                         |     |
| Regent's Park—4, Cumberland-st., u. t. 35 yrs., g.r.                                                                                                                                                                                                                                                                                                                                                                | 240 |
| Kenington—37, Trevett-st., u. t. 75 yrs., g.r.                                                                                                                                                                                                                                                                                                                                                                      | 95  |
| 77, 10s., r. £45 p.a.                                                                                                                                                                                                                                                                                                                                                                                               | 255 |
| Kilburn—1A, Offenheimer-ter., u. t. 74 yrs., g.r. £2, in hand                                                                                                                                                                                                                                                                                                                                                       |     |
| (Contractors used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; o. for estimated rental; u. t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.) |     |

## MEETINGS.

SATURDAY, JUNE 1.  
*Architectural Association.*—Visit to the New Building, at the College, Birkenhead, architect.  
*Royal Institution.*—Professor W. Knight on "The Classification of the Sciences, Historical and Critical." 3 p.m.

MONDAY, JUNE 3.  
*Royal Institute of British Architects.*—Mr. Basil Champneys on "The History and Uses of Plaster-Work, especially as relating to Ornamental Ceilings." 8 p.m.  
*Royal Institution.*—Meeting. 8 p.m.  
*Society of Engineers.*—Mr. H. Fajls on "The Forced Percolation of Water through Concrete." 7.30 p.m.  
*Works of the Works' Association (Carpenters' Hall).*—Monthly Meeting. 8 p.m.

TUESDAY, JUNE 4.  
*Society of Biblical Archaeology.*—8 p.m.

WEDNESDAY, JUNE 5.  
*Architectural Association.*—Annual Dinner, Holborn.  
*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting. 8.30 p.m.

THURSDAY, JUNE 6.  
*Society of Antiquaries.*—Ballot for the election of Fellows. 8.30 p.m.

FRIDAY, JUNE 7.  
*Royal Institution.*—Mr. A. Geikie, F.R.S., on "Recent Researches into the Origin and Age of the Highlands of Scotland and the West of Ireland." 8 p.m.

## Miscellaneous.

**The Royal Archaeological Institute.**—We hear that the programme of this year's annual meeting, which is to be held at Norwich in August next, is now fairly settled, and the following is an outline of the arrangements, subject to possible alterations:—The president of the meeting will be the Duke of Norfolk, E.M. The meeting will commence on Tuesday, August 6, and will terminate on Wednesday, August 14. On Tuesday, August 6, there will be a reception in St. Andrew's Hall, and in the afternoon the Cathedral will be visited, under the guidance of Mr. J. Willis Clarke. On Wednesday, August 7, Castle Acre will be visited, under Dr. Jessopp's guidance. The Roman Earthworks will be described by Mr. G. E. Fox, the Castle by Mr. Hartshorne, and the Priory by Mr. W. H. St. John Hope. On Thursday, August 8, in the morning, Norwich Castle will be visited, under the guidance of Mr. Hartshorne. In the afternoon, Carrow Priory will be visited. On Friday, August 9, there will be an excursion (by water) to Burgh Castle and to Yarmouth. On Saturday, August 10, there will be an excursion, during which Cley Church (a fine Decorated building, very little known), Blakeney Church, and Bingham Priory (Norman and Early English) will be visited. On Monday, August 12, Cawston and Sall Churches will be visited, under the guidance of Mr. J. T. Micklethwaite. Thence there will be a drive through Blickling Park to Blickling Hall. On Tuesday, August 13, Barton Turf Church (noted for its screen), Tunstead Church (Decorated, and with curious altar-pattern), Worstead Church (which we recently illustrated), Knapton Church (with its double hammer beam roof), and Trunch Church (with its baptistery) will be visited. On the last day, Wednesday, August 14, there will be an excursion (by water) in the Broad district, taking in Ranworth and Ludham Churches. Several good papers will, it is expected, be read at the Sectional Meetings, including one by Mr. G. E. Fox on "Roman Norfolk."

**Maldon Sewerage.**—The Town Council of Maldon, Essex, at its last monthly meeting, resolved to carry out the plans submitted by Messrs. R. B. Grantham & Son in 1885, and approved by the Local Government Board in 1887, for the sewerage and disposal of the sewage of the principal portion of the town.

**The Sukkur Bridge.**—Regarding the oscillation of this bridge, Mr. Robertson, the Superintending Engineer, writes to the *Indian Engineer*:—"The number of men assembled on the bridge to test it with the seismograph was not so great as on the opening day. The oscillation was also judged by those present on both occasions to have been rather less than with the larger crowd—perhaps half an inch; so that on the opening day it may have been so much as 2 in., but not more. This was also the estimate made by myself and other engineers at the time. The following experiment will probably convince those who think the amount here stated insufficient to account for their sensations.—Stand on a plank on rollers, and get somebody to shake it backwards and forwards 2 in. at the rate of fifty-four beats per minute. The bridge was covered in the centre as well as on the sidewalks after the passage of the train till about two in the afternoon; it was during this time that the oscillation was observed by spectators from below. The seismograph was tried in the centre of the bridge as well as on the noses of cantilevers with the same result. This central portion is simply a 200-ft. girder resting on the cantilevers, and is no more likely to oscillate than an ordinary bridge. If the cantilevers oscillate, it must partake of the motion; but the centre might be absolutely at rest if the ends happened to vibrate in opposite directions at the same time. As a matter of fact, both the cantilevers vibrated in the same direction and the girder with them, but as the latter, which is 200 ft. long, had the full vibration for its whole length, whereas the apparent motion of the cantilevers diminished from the nose inwards, it doubtless appeared to move more. Nor does this movement cause any strain at all in the central girder; it simply moves with its supports. And it may assure the nervous traveller to know that the cantilever can deflect 2½ in. to either side of the centre line, equal to a total motion of 5 in., with only the ordinary working strain in the metal, and that even this amount might be rather more than doubled without passing the elastic limit." This statement will be of some interest now that the cantilever form of bridge seems to be coming so much into favour.

**The late Earl of Cardigan's Estates.**—In our columns of August 18 and November 10, 1888, we referred to the then projected sales of Kirkstall Abbey and a portion, being the first, of the Cardigan estates in Yorkshire, West Riding. At the sale, on December 12, the former property was withdrawn at a bid of 6,100, by the Leeds Town Council, the reserved price having been fixed at 10,000. On Jan. 25 Colonel J. T. North, of Eltham, in Kent, and a native of Leeds, gave to the Corporation a cheque wherewith to purchase the Abbey ruins, together with its grounds of 12 acres, and so to preserve them for the use and enjoyment of his fellow townfolk. By direction of the trustees the remaining portions of the Leeds division of these estates will be put up for sale by auction at Leeds in the course of next July. The seventy-seven lots comprise various buildings, market-gardens, farms, holdings, accommodation lands, and the like, that cover nearly 700 acres in all, and lie within the neighbouring townships or parishes of Farnley, Bramley, Newlay, Haddingley, Burley, Kirkstall, and Horsforth. They include, further, the paper mills at Woodsie, Kirkstall Hall with the Hall farm, and the Park Spring Wood and Quarry. The Wakefield division will also be offered for sale in that city in July. The 133 lots, extending over about 3,970 acres in the aggregate, consist of similar properties to the foregoing, situated in East and West Ardsley, Alverthorpe, Ossett-cum-Gawthorpe, and Wakefield itself. This sale includes a wharf by Calder side; the site, at Tingley, of the West Yorkshire Iron and Coal Company's works, 144 acres; and Howley Hall, with its grounds of 216 acres, in Morley parish, a former seat of the Saville family.

**An Academy for the Restoration of Paintings.**—The Prince-Regent of Bavaria has decided upon establishing a special academy at Munich for the restoration of old paintings;—an institute which does not exist in any other city. Professor Alois Hausen, well known for his restoration of the Holbein Madonna at Darmstadt, has been appointed director of this novel and, we may add, rather alarming institution.

**Surveyorship, Carlisle.**—Mr. H. U. McKie, City Surveyor of Carlisle, has resigned that office.

**The Registration of Plumbers.**—At the monthly meeting of the Court of the Worshipful Company of Plumbers, held at the Guildhall on the 22nd ult., it was reported that meetings of the Registration Committee had been held during the month in Newcastle-on-Tyne, Liverpool and Dublin. The report of the annual meeting of the District Council for Glasgow and the West of Scotland was presented, from which it appeared that 487 members had been registered, and that the average attendance of apprentices at the Plumbers' Classes was 109. Prizes were awarded to the successful students for the best illustrated notes of lectures, essays on plumbing and sanitation, written exercises by apprentice plumbers, &c. The Class Committee reported that very commendable attention had been shown by the students, and Prof. Jamieson mentioned that many of the apprentice plumbers' note-books were quite equal to those of the students in the Class on Applied Mechanics. Applications to establish Plumbers' Classes in various districts were reported, and it was also stated that upwards of 1,400 plumbers are now waiting to pass the Company's Examinations in various provincial centres. The North of England Council reported that during the month forty-two plumbers had been registered, and that the applications received extended over the counties of Northumberland, Westmoreland, Durham, and the North Riding of Yorkshire. The Council urged the Company to provide facilities for examinations and classes in these counties. A financial statement to March 31 last was prepared and ordered to be printed. By this it is seen that up to that date the Company expended on the registration department 4,532l. 13s. 3d., and that the fees received from the plumbers registered amounted to 1,756l. 18s. 6d., leaving a balance of 2,775l. 14s. 9d. provided by the Company. A communication from the Committee for the Western District of London, expressive of the desire that a mass meeting of plumbers should be convened to consider the further extension of the registration system in that district, was laid before the Court, and the Court decided to defray the necessary expenses in connexion with such meeting, believing it to be in the interest of the public.—A deputation from the Registration Committee of the Plumbers' Company, composed of masters and operatives, and representative plumbers from all parts of the country, had an interview on Tuesday last with Mr. Ritchie, at the Local Government Board, to ask him to recommend the use of qualified plumbers bearing certificates of the Company of their efficiency, for employment by Boards of Guardians and other local authorities over which the Local Government Board had control. Mr. Ritchie, in reply, said it did not require that influential deputation to convince him of the immense importance of the subject, for he did not know any body of men upon whom they were more dependant in matters of health than upon plumbers. As to the request that he should ask local authorities to employ none but registered plumbers, he would consider whether he could officially make such representations, but in the meantime the Company were at liberty to inform local authorities that the movement had his most entire and most cordial sympathy.

**A New Gas Enricher.**—The Gas-Lighting Improvement Company send us a report by Mr. Corbett Woodall, M.Inst.C.E., on a system of enriching or carburetted coal-gas, patented by Mr. Maxim, and now in use at the Erit Works of the Maxim Nordenfeldt Company. The report describes the apparatus as consisting of "a retort in which the gasoline or other hydro-carbon is vaporized, and a mixing chamber in which the vapour is combined with the gas to be enriched. The gasoline is fed from a tank placed outside the building, and at such a height that the retort is kept charged by gravity. The vaporising is effected by steam or hot water circulating through a jacket round the retort. The apparatus is simple, safe in use, compact, and occupies but very small space." Mr. Woodall states, as the result of his examination, that by this system the amount of light required can be obtained with one-third the amount of gas ordinarily required, and at a reduced cost of from 30 to 60 per cent. as against the average present cost of gas-lighting.

**The Prince's Club, Knightsbridge.**—A description of this building, recently opened by the Prince of Wales, is unavoidably held over until next week.



**Liverpool Architectural Society.**—The annual general meeting of this society was held on Monday evening at the Royal Institution, Colquitt-street. The president (Mr. E. Kirby) was in the chair, and there was a fair attendance of members. From the report of the honorary secretary, the finances of the society appeared to be in a prosperous and improving condition. Messrs. T. W. B. Harding and R. F. Atkinson were elected student members; Mr. R. Holt, associate; and Mr. H. A. Mateu, fellow of the Society. The following were elected officers for the next session:—President, Mr. T. Mellard Reade, F.S.A.; vice-presidents, Messrs. F. W. Hornblower and G. W. Bleasie; librarian, Mr. H. L. Thorneley; treasurer, Mr. J. Dod; secretary, Mr. H. L. Beckwith; Council, Messrs. O. Aldridge, Thomas Cook, F. W. Hornblower, J. M. Hay, T. H. Harrison, E. Kirby, W. Parslow, J. A. Berrington, and H. W. Keefe. The President, in the course of his annual address, referred to the affiliation of the Society with the Royal Institute of British Architects, and the advantages that were expected to accrue therefrom to the society. He also drew particular attention to the 41st clause of the Liverpool Corporation Bill, which was of interest to them both as citizens and professional men. They would notice the sweeping character of the clause, which applied not only to the future, but was also retrospective. He also referred to the invitation of the Bootle Town Council to the society to nominate three of their members to act as arbitrators for the new Bootle police-court buildings. The meeting concluded with the customary vote of thanks to the President.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                                               | £. s. d. | £. s. d. |
|-------------------------------------------------------|----------|----------|
| Greenheart, B.G. .... ton                             | 8 10 0   | 7 10 0   |
| Teak, E.I. .... load                                  | 11 10 0  | 15 0 0   |
| Siquina, U.S. .... foot cube                          | 0 2 0    | 0 3 0    |
| Ash, Canada, .... load                                | 3 10 0   | 5 0 0    |
| Birch " " " " " " " " " "                             | 3 10 0   | 6 0 0    |
| Elm " " " " " " " " " "                               | 4 0 0    | 5 0 0    |
| Fir, Dantie, &c. .... ton                             | 2 0 0    | 3 10 0   |
| Oak " " " " " " " " " "                               | 2 10 0   | 4 10 0   |
| Canada " " " " " " " " " "                            | 5 10 0   | 7 10 0   |
| Fine, Canada red " " " " " " " " " "                  | 3 5 0    | 4 0 0    |
| " yellow " " " " " " " " " "                          | 3 10 0   | 5 10 0   |
| Lath, Dantie, .... fathom                             | 4 10 0   | 5 10 0   |
| St. Petersburg " " " " " " " " " "                    | 5 0 0    | 6 10 0   |
| Walnut, Riga, &c. .... ton                            | 2 15 0   | 3 5 0    |
| Deals, Finland, 2nd and 1st, std. 100                 | 9 10 0   | 11 0 0   |
| " " " " " " " " " " " "                               | 8 0 0    | 9 0 0    |
| " 4th and 3rd " " " " " " " " " "                     | 7 10 0   | 8 0 0    |
| " " " " " " " " " " " "                               | 8 0 0    | 9 0 0    |
| " 2nd " " " " " " " " " "                             | 10 0 0   | 11 0 0   |
| " white " " " " " " " " " "                           | 7 10 0   | 10 0 0   |
| Swedish " " " " " " " " " "                           | 9 0 0    | 10 0 0   |
| White Pine " " " " " " " " " "                        | 9 10 0   | 12 0 0   |
| Canada, Pine, 1st " " " " " " " " " "                 | 16 0 0   | 26 10 0  |
| " " " " " " " " " " " "                               | 11 0 0   | 17 10 0  |
| " " " " " " " " " " " "                               | 8 0 0    | 10 10 0  |
| " Spruce, 1st " " " " " " " " " "                     | 9 10 0   | 11 0 0   |
| " " " " " " " " " " " "                               | 7 10 0   | 9 0 0    |
| New Brunswick, &c. .... ton                           | 6 15 0   | 8 15 0   |
| Battens, all kinds, 12 ft. by 4 in. by 2 in. .... ton | 6 10 0   | 20 0 0   |
| Flooring Boards, 12 ft. by 4 in. by 2 in. .... ton    | 0 11 0   | 0 14 6   |
| Second " " " " " " " " " " " "                        | 0 8 0    | 0 10 9   |
| Other qualities " " " " " " " " " " " "               | 0 6 0    | 0 7 0    |
| Cedar, Cuba, .... foot                                | 0 0 44   | 0 0 44   |
| Honduras, &c. .... ton                                | 0 0 44   | 0 0 44   |
| Mahogany, Cuba, .... ton                              | 0 0 44   | 0 0 44   |
| St. Domingo, cargo average " " " " " " " " " "        | 4 0 0    | 12 0 0   |
| Mexican " " " " " " " " " " " "                       | 0 0 44   | 0 0 44   |
| Tobacco " " " " " " " " " " " "                       | 0 0 54   | 0 0 54   |
| Honduras " " " " " " " " " " " "                      | 0 0 54   | 0 0 54   |
| Box, Turkey " " " " " " " " " " " "                   | 4 0 0    | 12 0 0   |
| Rose, Rio " " " " " " " " " " " "                     | 15 0 0   | 20 0 0   |
| Bahia " " " " " " " " " " " "                         | 14 0 0   | 18 0 0   |
| Satin, St. Domingo " " " " " " " " " " " "            | 0 0 0    | 0 1 0    |
| Porto Rico " " " " " " " " " " " "                    | 0 0 0    | 0 1 0    |
| Walnut, Italian " " " " " " " " " " " "               | 0 0 44   | 0 0 44   |
| METALS.                                               |          |          |
| Iron—Bar, Welsh, in London .... ton                   | 5 5 0    | 5 10 0   |
| " " " " " " " " " " " "                               | 4 15 0   | 5 0 0    |
| " " " " " " " " " " " "                               | 5 10 0   | 6 10 0   |
| COPPER.                                               |          |          |
| Best selected " " " " " " " " " " " "                 | 46 10 0  | 47 10 0  |
| Sheets, strong " " " " " " " " " " " "                | 52 0 0   | 53 0 0   |
| Chill, bar " " " " " " " " " " " "                    | 41 10 0  | 0 0 0    |
| YELLOW METAL.                                         |          |          |
| Lead—Sheet, English, .... lb.                         | 0 0 5    | 0 0 54   |
| BRASS.                                                |          |          |
| Lead—Sheet, English, .... ton                         | 13 10 0  | 14 0 0   |
| Silesian, special " " " " " " " " " " " "             | 18 2 0   | 0 0 0    |
| Ordinary brands " " " " " " " " " " " "               | 18 0 0   | 0 0 0    |
| TIN.                                                  |          |          |
| Straits " " " " " " " " " " " "                       | 92 10 0  | 0 0 0    |
| Australian " " " " " " " " " " " "                    | 92 10 0  | 0 0 0    |
| English Ingots " " " " " " " " " " " "                | 95 0 0   | 0 0 0    |
| ZINC—English sheet " " " " " " " " " " " "            | 21 0 0   | 22 0 0   |
| OILS.                                                 |          |          |
| Lined " " " " " " " " " " " "                         | 20 0 0   | 20 5 0   |
| Cocanut, Ceylon " " " " " " " " " " " "               | 27 0 0   | 28 0 0   |
| Ceylon " " " " " " " " " " " "                        | 24 10 0  | 24 15 0  |
| Palm, Lagos " " " " " " " " " " " "                   | 24 0 0   | 25 0 0   |
| Kaposed, English pale " " " " " " " " " " " "         | 28 0 0   | 28 10 0  |
| " brown " " " " " " " " " " " "                       | 27 0 0   | 0 0 0    |
| Cottonseed, refined " " " " " " " " " " " "           | 24 10 0  | 25 10 0  |
| Tallow and Oleine " " " " " " " " " " " "             | 19 0 0   | 45 0 0   |
| Lubricating, U.S. " " " " " " " " " " " "             | 5 0 0    | 6 0 0    |
| " refined " " " " " " " " " " " "                     | 7 0 0    | 12 0 0   |
| Tar—Stockholm " " " " " " " " " " " "                 | 1 2 9    | 1 3 0    |
| Archangel " " " " " " " " " " " "                     | 0 15 6   | 0 0 0    |

#### CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

##### CONTRACTS.

| Nature of Work, or Materials.              | By whom Required.                      | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|--------------------------------------------|----------------------------------------|-----------------------------------|--------------------------|-------|
| Brick Sewer at Kingston-on-Thames          | Sarbiton Imp. Com.                     | Samuel Mather                     | June 3rd                 | xii.  |
| Water Tank, Fittings, &c.                  | Edmonton Union                         | T. E. Knightly                    | June 4th                 | xii.  |
| Making-good Alexandria-road                | Southern Local Board                   | P. Dodd                           | do.                      | xii.  |
| Concrete Paving and Kerling                | Hayward's Heath L. B.                  | Official                          | June 5th                 | ii.   |
| Additions, &c., to Union Workhouse         | Poplar Union                           | W. A. Hills & Son                 | do.                      | ii.   |
| Works of Water Supply                      | Punefrat C. Corporation                | G. Hodson                         | June 8th                 | xii.  |
| Waiting Rooms, Hornsey                     | Midland Railway Co.                    | Official                          | June 7th                 | xii.  |
| New Bath Block                             | Durham County Lunatic Asylum           | W. Crozier, Jun.                  | June 8th                 | xii.  |
| New Offices, Cardiff                       | Messrs. Cory Bros. & Co., Lim.         | E. H. Bruton                      | do.                      | xii.  |
| Tar Paving                                 | Willenden Local Board                  | O. Claude Robson                  | June 11th                | xii.  |
| Brick-lined Concrete, &c., Pipe Sewers     | West Ham Council                       | L. Angell                         | do.                      | xii.  |
| Street Sweeping Machines                   | St. Mary, Islington, Vestry            | J. P. Barber                      | do.                      | xii.  |
| Sundry Works to Halesworth Parish Church   | The Committee                          | Francis & Sons                    | do.                      | xii.  |
| Broken Granite                             | Heavell Local Board                    | Official                          | do.                      | xii.  |
| Blue Quarrey Granite Spalls                | West Ham Union                         | do.                               | June 12th                | ii.   |
| Surface-water Sewers                       | Leyton Local Board                     | do.                               | June 18th                | xii.  |
| Painting, &c., Works, Fulham-road          | St. George's Union                     | H. Saxon Snell                    | do.                      | xii.  |
| Tar Paving                                 | Mel. Benedit Societies                 | do.                               | do.                      | xii.  |
| Construction of Reservoir, &c.             | Asylum, N. Bedford U.S.A.              | H. Chowins                        | June 19th                | xii.  |
| Wood Paving and Asphalte Paving            | St. Margaret, &c. (Westminster) Vestry | G. R. W. Wheeler                  | do.                      | xii.  |
| Erection of Board School                   | War Department                         | S. S. Stallwood                   | June 24th                | xii.  |
| Painting Barracks, Aldershot               | do.                                    | Official                          | Not stated.              | ii.   |
| Painting, Whitewashing, &c., Plymouth      | do.                                    | do.                               | do.                      | ii.   |
| Limewashing and Painting Works, Birmingham | do.                                    | do.                               | do.                      | ii.   |
| Painting, &c., Works, Gosport              | do.                                    | do.                               | do.                      | ii.   |
| New Factory, Southwark                     | Messrs. Day & Martin                   | Gardiner, Sn., & Theobald         | do.                      | xii.  |

##### PUBLIC APPOINTMENTS.

| Nature of Appointment.             | By whom Advertised.  | Salary.    | Applications to be in. | Page. |
|------------------------------------|----------------------|------------|------------------------|-------|
| Waste-water Inspector and Turncock | Ely Local Board      | Not stated | June 10th              | xvi.  |
| Surveyor                           | Mortlake Highway Bd. | 1800.      | June 22nd              | xvi.  |

##### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**ASPLEY GUYE (Beds.).**—For additions to a house at Mount Pleasant, Aspley Guye, Beds., for Miss Thorp. Mr. John S. Corder, architect, 9, Thorofore, Ipswich:—  
Samuel Foster, Bedford (accepted) ..... £277 0

**BAGENON (Gloucestershire).**—For works in restoration and additions to church. Mr. S. Gamber Parry, architect, Connaught Mansions, London, S.W.:—  
J. Clutterbuck, Gloucester ..... £431 0 0  
Wm. Jones, Gloucester ..... 392 0 0  
Wall & Hook, Brimscombe, Gloucester ..... 347 5 0  
Saunders, Cirencester, Gloucestershire ..... 333 10 0  
Restall & Son, Bisley, Gloucester? ..... 269 14 0  
\* Accepted.

**BRIDGWATER.**—For the erection of a new tower and tin-roof at the Northgate Brewery, Bridgwater, for Messrs. Starkey, Knight, & Co., Limited. Mr. Arthur Kinder, architect, Suffolk House, Laurence Pountney-hill, London. Quantities by Mr. Alexander H. Kinder, 34, Clement's-lane, London:—

Chesley, Bridgwater ..... £3,558 0 0  
Williams, North Petherton ..... 3,468 18 6  
Wall, London ..... 3,450 0 0  
Spiller, Taunton ..... 2,960 0 0  
Kraus, Bristol ..... 2,961 0 0  
Pollard, Bridgwater? ..... 2,946 0 0  
Harris & Tapscott, Bridge-water ..... 2,936 17 0  
\* Accepted, subject to modifications.

**BRITON FERRY.**—For laying oak parquet on uneven stone floors with Hindley's patent cement, at Baglan Hall, Briton Ferry, for Mrs. G. Llewellyn:—  
C. Hindley & Sons (accepted) ..... £139 10 0

**CARDIFF.**—For petty offices at the Barry Docks, for the Barry Dock and Railways Company. Messrs. Richards & Gethin, architects, Cardiff. Quantities by the architects:—  
D. Davies, Cardiff ..... £1,293 0 0  
G. Griffiths, Cardiff ..... 1,242 0 0  
D. J. Davies, Cardiff ..... 1,220 0 0  
J. Jones, Penarth ..... 1,215 0 0  
Bowers & Co., Hereford ..... 1,215 0 0  
Jones Bros., Cardiff ..... 1,197 0 0  
Shepherd & Co., Cardiff ..... 1,075 0 0  
T. Griffiths, Penarth (accepted) ..... 1,033 10 0

**CARDIFF.**—For erecting temporary offices, for H.M. Customs, at the Barry Docks, near Cardiff, for the Barry Dock and Railways Company. Messrs. Richards & Gethin, architects, Cardiff. Quantities by the architects:—  
Jones Bros., Cardiff ..... £840 0 0  
Turner & Sons, Cardiff ..... 758 0 0  
P. Price (accepted) ..... 725 0 0

**CARDIFF.**—For farmhouse at Burdonhill, near Cardiff, for the Trustees of the Wenvoe Castle Estate. Messrs. Richards & Gethin, architects, Cardiff. Quantities by architects:—  
D. Davies, Cardiff ..... £285 0 0  
R. Price, Cardiff ..... 775 8 8  
D. J. Davies, Cardiff ..... 740 0 0  
Jones Bros., Cardiff ..... 725 0 0  
W. James, Monmouth ..... 710 0 0  
G. Griffiths, Cardiff (accepted) ..... 693 2 0

**CARDIFF.**—For building new warehouse, The Hayes, for Mr. Geo. Hopkins, Messrs. Richards & Gethin, architects. Quantities by the architects, Cardiff:—  
Jones Bros., Cardiff (accepted) ..... £1,011 0 0

**CARDIFF.**—For additions to Malhouse, Cardiff, for Messrs. Wm. Hancock & Co., Limited. Mr. W. D. Bleasley, architect, Cardiff:—  
Samuel Lewis ..... £5,598 0 0  
Obas, Bird ..... 3,070 0 0  
Shepton & Son ..... 2,893 10 0  
James Allan (accepted) ..... 2,745 16 0  
Turner & Sons ..... 2,724 0 0  
Charles G. Dunn ..... 2,680 0 0  
Smalridge & Francis ..... 2,562 0 0  
[All of Cardiff.]

**CHESHUNT.**—For works in connection with their new scheme of water supply for the Cheshunt Local Board. Mr. T. Bennett, Engineer:—

**Contract I.**—For Sinking Deep Well and Artesian Boring at Newgate-street Pumping Station.  
Orlando Rowson & Co. .... £5,950 0 0  
T. Tilley & Sons ..... 5,835 0 0  
Z. Hills & Co., Leamington ..... 5,450 0 0  
C. Chapman, Salford ..... 3,439 0 0  
J. & F. Bennett, Northampton ..... 3,005 11 6  
W. Hill & Co., Westminster ..... 2,987 0 0  
E. Timmins, Runcorn ..... 2,934 0 0  
T. Doocra & Sons, London? ..... 2,790 0 0  
Le Grand & Sutcliffe (withdrawn) ..... 2,625 17 6  
G. Bell, Tottenham ..... 2,176 0 0  
J. Vivian, Whitehaven (withdrawn) ..... 2,010 15 3  
J. Dickson, St. Albans ..... 1,793 5 0  
(\* Accepted.)

**Contract II.**—For the Supply and Erection of a Pair of Compound Engines.  
W. & J. Yates, Canal Foundry, Blackburn (accepted) ..... £2,550 0 0  
[There were twenty-six tenders.]

**Contract III.**—For the Supply and Delivery of about 1,500 tons of Water Mains.  
Teeside Iron Co., Middlesbrough ..... £8,630 8 8  
J. Oken & Son, London ..... 6,809 16 0  
Firmstone Bros., Stourbridge ..... 6,157 0 0  
Cochrane & Co., Dudley ..... 5,887 8 2  
J. & S. Roberts, West Bromwich ..... 5,782 16 0  
Cochrane, Grove, & Co., Middlesbrough ..... 5,718 6 1  
Stanley Coal and Iron Co., Stanton Gate (accepted) ..... 5,395 5 1

**Contract IV.**—For the Construction of a Covered Service Reservoir, and for the Laying of Water-mains:—  
J. K. Bloomfield, Tottenham ..... £10,355 0 0  
J. W. & J. Neas, Walthamstow ..... 8,987 0 0  
J. Jowett, Northampton ..... 7,913 15 3  
G. Bell, Tottenham ..... 7,790 0 0  
J. Biggs ..... 7,665 0 0  
A. J. Gould ..... 7,614 0 0  
C. Lewis, Witham ..... 7,933 19 7  
J. Dickson, St. Albans ..... 7,551 8 8  
J. Young & Son ..... 7,156 0 0  
Holme & King ..... 7,135 1 1  
Pickthall & Sons ..... 6,481 14 3  
J. Jackson, Enfield (accepted) ..... 6,393 0 0

**Contract V.**—For Supplying Sluice-valves, Hydrants, Standpipes, &c.  
Newton, Chambers, & Co. .... £262 14 6  
J. Warr & Son ..... 234 0 0  
Guest & Chimes ..... 709 4 0  
Hamilton, Woods, & Co. .... 649 10 6  
Glenfield & Co. .... 620 13 0  
Beck & Co. .... 617 9 0  
Blakeborough & Sons (accepted) ..... 616 7 6  
Stone & Co. .... 606 7 2



**CRESHKENT.**—For sewerage, paving, and making up roads in the district of the Chestnut Local Board, viz., Silchester, Melbourn-street, Harold-street, Waltham Cross. Mr. Thomas Bennett, Engineer:—  
 F. Saunders, Waltham Cross ..... 2,387 0 0  
 H. Potter, London ..... 2,000 0 0  
 J. Jackson, Enfield ..... 1,987 0 0  
 J. Dickson, St. Albans ..... 1,638 0 0  
 G. Bell, Tottenham ..... 1,690 0 0  
 J. Bloomfield, Tottenham (accepted) ..... 1,339 0 0  
 H. Morris & Co., London ..... 1,250 0 0

**CHELTENHAM.**—For alterations and additions to "Woodlands," for Mr. F. Worsley, Messrs. Wyson & Lenz, architects, 85, King William-street, Strand:—  
 Rainger & Wilson, Cheltenham (accepted) ..... 2,805 0 0

**DURHAM.**—For constructing 1,402 lineal yards of 12-in., 9-in., and 6-in. pipe sewers, with ventilation and inspection shafts, at Mount Pleasant, Tudhoe, for the Rural Sanitary Authority of the Durham Union. Mr. Geo. Gregson, surveyor, Durham:—  
 Thomas Dixon, Houghton-le-Spring, Co. Durham ..... £284 4 0  
 John Heslop, Low Pittington, near ..... 278 10 0  
 John Carrick, Durham (accepted) ..... 273 2 7  
 [Surveyor's estimate, £277 14s. 9d.]

**ELTHAM.**—For making new roads and sewers and building boundary-wall, for Colonel North:—  
 Kirk & Randall ..... £8,329 0 0  
 Mowlem ..... 6,254 0 0  
 Chapman & Son, London ..... 6,147 0 0  
 Killingsback ..... 5,905 0 0  
 Smith & Son ..... 5,307 0 0

**FAWLEY (Hants).**—For alterations and additions to "Cophorne," Fawley, Hants. Mr. W. H. Mitchell, architect, Southampton:—  
 W. R. & C. Light, Portsmouth\* ..... £3,936 0 0  
 \* Accepted.

**IPSWICH.**—For new road, sewer, &c., for the British Land Company, Limited, on their Belle Vue Estate. Mr. Henry B. Nichol, surveyor:—  
 Grimwood & Son, London ..... £705 0 0  
 Fisk ..... 675 0 0  
 Gibbons ..... 650 0 0  
 Bennett (accepted) ..... 590 0 0

**LEATHERHEAD.**—For additions to St. John's Foundation School, Leatherhead. Mr. R. Cresce Harrison, architect. Quantities by Mr. A. J. Gate:—  
 Clarke & Bracy, London ..... £2,283 0 0  
 Colls & Sons, London ..... 2,340 0 0  
 Haseman, Ashted ..... 2,259 0 0  
 Lawrence, London ..... 2,116 0 0  
 B. Ingram & Co., Hertham ..... 1,983 0 0  
 W. H. Butcher, Leatherhead ..... 1,999 10 0  
 Brown, Leatherhead ..... 1,746 0 0

**LEICESTER.**—For the construction of outfall sewer along the Belgrave-road, to the New Pumping Station. Drawings, specifications, and bill of quantities by Mr. J. Gordon, M. Inst. C. E., Borough Surveyor:—  
 G. Longdon & Son, Sheffield ..... £19,359 17 5  
 Abram Kellert, London ..... 18,549 10 0  
 James Evans, London ..... 16,513 8 0  
 Thos. Fitchell, Leicester ..... 16,393 10 6  
 James Dickson, St. Albans ..... 16,803 0 11  
 S. & E. Bentley, Leicester\* ..... 14,506 0 2  
 \* Accepted.

**LONDON.**—For the erection of spire, galleries, and organ-chamber, &c., at the Strathman Wesleyan Chapel. Mr. Charles Bell, architect. Quantities by Messrs. Cordery & Selby:—  
 Colls & Sons ..... £8,357 0 0  
 Goad ..... 6,289 0 0  
 Brown, Son, & Co. .... 6,284 0 0  
 Higgs ..... 6,180 0 0  
 Hill Bros. & Co. .... 6,073 0 0  
 Smith & Sons ..... 5,337 0 0  
 Greenwood ..... 5,047 0 0  
 Bowyer ..... 4,965 0 0  
 Dove ..... 4,865 0 0  
 Allen & Sons ..... 4,768 0 0  
 Holloway ..... 4,615 0 0

[The three lowest were asked to tender again on a revised design for spire, and the tender of Messrs. Allen & Sons was accepted at £4,088.]

**LONDON.**—For new manufacturing premises, Pomeroy-street, S.E., for Mr. Richard Davis. Mr. A. Lett, architect, 4, Bond-street, W. Building. Concrete Floor.  
 Trevisks ..... £764 0 0 ..... 638 10 0  
 Clark & Son ..... 748 0 0 ..... 64 0 0  
 W. Palmer ..... 706 0 0 ..... 65 0 0

**LONDON.**—For the erection of club premises in Walworth-road, for Mr. Critchton Temple. Mr. G. H. Flack, architect, 9, Bedford-row. Quantities by Mr. H. Reginald Messinge:—  

|                       | Club.  | Concert. | Total. |
|-----------------------|--------|----------|--------|
| Manley & Sons         | £2,438 | £282     | £2,818 |
| Balaam                | 2,305  | 348      | 2,653  |
| Sawyer                | 2,341  | 299      | 2,640  |
| Woodward & Co.        | 2,400  | 326      | 2,655  |
| Patman & Fotheringham | 2,300  | 270      | 2,570  |
| Jackson & Todd        | 2,179  | 345      | 2,524  |
| Burman                | 2,560  | 306      | 2,866  |
| Downs                 | 2,110  | 270      | 2,380  |
| J. & J. Greenwood     | 2,111  | 249      | 2,360  |

**LONDON.**—For erecting "St. John's Mission Hall, Hoxdown." Messrs. Newman & Newman, architects:—  
 J. & J. Greenwood ..... £2,700 0 0  
 Dove Bros. .... 2,435 0 0  
 Roberts & Co. .... 2,320 0 0  
 W. Downes ..... 1,760 0 0  
 G. Pottor ..... 1,700 0 0  
 Balaam Bros. .... 1,700 0 0  
 W. Fitchard ..... 1,672 0 0  
 J. Bullers (accepted) ..... 1,600 0 0

**LONDON.**—For alterations and new bar-fittings at the "Norwood Hotel," West Norwood, for Mr. J. H. H. Messrs. Wyson & Lenz, architects, 15, King William-street, Strand:—  
 W. Oldrey & Co. (accepted) ..... £3,000 0 0

**LONDON.**—For alterations at "The Windsor," Strand. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within:—  
 Higgs ..... £2,530 0 0  
 G. W. Beale, Cambridge Heath ..... 2,375 0 0  
 W. Smith ..... 2,335 0 0  
 Jackson & Todd ..... 2,298 0 0  
 Allen & Son ..... 2,178 0 0  
 J. Anley ..... 2,130 0 0  
 Spencer & Co. .... 2,090 0 0

**LONDON.**—For the erection of two dwelling-houses, business premises, and stables, Ford-street, Bethnal Green, S.E., for Messrs. H. & J. Savage. Mr. Charles E. Jackson, architect, 185, Grove-road, E.:—  
 Couzell Bros., Bethnal Green, E. .... £1,292 0 0  
 G. W. Beale, Cambridge Heath ..... 1,257 0 0  
 C. Everard, Stratford, E. .... 1,269 0 0  
 G. Baney, Stratford, E. .... 1,175 0 0  
 Boulter & Lee, Forest Gate, E. .... 1,018 0 0  
 \* Accepted.

**LONDON.**—For the erection of dwelling-house and shop, 18, Paul-street, Finsbury, for Mrs. E. Lucas. Mr. Charles E. Jackson, architect, 185, Grove-road, E.:—  
 Boulter & Lee, Forest Gate, E. .... £1,726 0 0  
 Jackson & Todd, Hackney-road, E. .... 1,777 0 0  
 G. W. Beale, Cambridge Heath ..... 1,678 0 0  
 C. Everard, Stratford, E. .... 1,629 0 0  
 Couzell Bros., Bowwell Works, Bethnal Green (accepted) ..... 1,461 0 0  
 North Bros., Stratford, E. (withdrawn) ..... 1,392 0 0

**LONDON.**—For erecting new billiard-room, and sundry alterations, to "The Redcliffe," Fulham-road, for Mr. Robert B. Roper. Mr. W. G. Shoebridge, architect, 158, Strand, W.C.:—  
 Schlatter ..... £729 0 0  
 Burton & Son ..... 644 0 0  
 White & Co. .... 483 0 0  
 Stead ..... 474 0 0  
 Turle & Appleton (accepted) ..... 385 0 0

**LONDON.**—For reinstatement after fire at 171, Fenchurch-street, E.C., for Mr. W. J. Ellis. Mr. W. Sack Payne, architect. Quantities by Messrs. Hovenden & Berridge, 181, Bishopsgate-street Without:—  
 E. Tombs ..... £1,387 0 0  
 Ashby Bros. .... 1,293 0 0  
 B. E. Nightingale ..... 1,347 0 0  
 Colls & Sons ..... 1,248 0 0  
 Holliday & Greenwood ..... 1,533 0 0  
 Laurance & Sons ..... 1,193 0 0

**LONDON.**—For erecting new premises, James-street, Old-street, for Mr. L. Marshall. (Third Contract.) Mr. C. H. Flack, architect. Quantities by Mr. H. Reginald Messinge:—  

| No. 1                                      | No. 2 |        |
|--------------------------------------------|-------|--------|
| Woodward & Co. .... Warehouses. Warehouse. | £273  | £1,123 |
| J. Morter ..... 843                        | 1,067 |        |
| Sawyer ..... 797                           | 1,086 |        |
| W. Downes ..... 769                        | 1,047 |        |
| Patman & Fotheringham ..... 728            | 1,023 |        |
| Manley & Son ..... 890                     | 950*  |        |

 \* Accepted.

**LONDON.**—For the erection of new premises, No. 232, Blackfriars-road, for Mr. David Isaac and others. Mr. C. H. Flack, architect, 9, Bedford-row. Quantities by Mr. H. Reginald Messinge, 222, High Holborn:—  
 J. Morter ..... £1,552 0 0  
 Jackson & Todd ..... 1,474 0 0  
 Woodward & Co. .... 1,473 0 0  
 Manley & Son ..... 1,468 0 0  
 J. & J. Greenwood ..... 1,450 0 0  
 W. Downes ..... 1,396 0 0  
 Patman & Fotheringham ..... 1,350 0 0  
 Balaam Bros. .... 1,285 0 0

**LONDON.**—For alterations, &c., to "The Swan," Smead-street, W., for Mr. R. H. Barnes. Mr. H. L. Newton, architect, 49, Victoria-street, S.W.:—  
 H. & E. Lea, Regent-street ..... £1,610 0 0  
 H. Burman & Sons, Kensington Park ..... 1,605 0 0  
 S. R. Gidden, Bryanston-square ..... 1,593 0 0  
 S. R. Lambie, Kenilworth ..... 1,433 0 0  
 Smith, Son, & Fletcher, Belgrave ..... 1,320 0 0  
 \* Accepted.

**LONDON.**—For rebuilding the "Three Tuns" public-house, Rupert-street, for Mr. G. W. F. Guyer. Messrs. Wyson & Lenz, architects, 15, King William-street, Strand. Quantities by Messrs. Argent & Woodward:—  
 Kirk & Ball ..... £2,170 0 0  
 Patman & Fotheringham ..... 2,152 0 0  
 T. L. Green ..... 1,984 0 0  
 W. Oldrey & Co. .... 1,957 0 0  
 J. T. Chappell (accepted) ..... 1,889 0 0

**LONDON.**—For new saloon bar at the "Durham Castle" public-house, Seven Sisters-road, for Mr. James Kirk. Messrs. Wyson & Lenz, architects, 15, King William-street, Strand:—  
 W. Oldrey & Co. .... £257 0 0  
 R. Eddie ..... 253 2 11  
 J. T. Chappell\* ..... 235 0 0  
 \* Reduced to £230 and accepted.

**LONDON.**—For building cottages in King-street, Lambeth. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within:—  
 J. Stephenson (accepted) ..... £1,063 0 0

**LONDON.**—For work at the "White Horse" Tavern, Cornhill-road, Lambeth. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within:—

Plastering. J. Heath (accepted) ..... £275 0 0  
 Guffitting. W. Winn (accepted) ..... 226 0 0

**LONDON.**—For improvements at the "Royal Vauxhall" Tavern, Kennington lane. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within:—  
 W. Smith, Harleyford-road, Kennington (accepted) ..... £238 0 0

**LONDON.**—For alterations and repairs to the "Opera" Tavern, Haymarket, for Mr. Jefferson. Mr. G. Treacher, architect:—  
 J. Walker ..... £159 0 0  
 J. Warn ..... 151 0 0  
 Bright ..... 135 0 0  
 Lobb & Oliver (accepted) ..... 119 0 0

**LONDON.**—For alterations required at the "Plough" Tavern, Coleman-street. Mr. G. Treacher, architect:—  
 Eulet ..... £169 0 0  
 Pitcher & Son ..... 161 0 0  
 Lobb & Oliver (accepted) ..... 140 15 0

**LONDON.**—For building Rose Cottage, Mason's-hill, Bromley, for the Rev. H. A. Soames. Messrs. Watson & Somers, architects, 8, Nottingham-place, W.:—  
 Taylor & Son ..... £269 0 0  
 T. W. Jones ..... 496 0 0  
 G. H. Lay (accepted) ..... 483 0 0

**LONDON.**—For the erection of mission-hall, 179, Tabard-street, S.E. Messrs. Noble & West, architects:—  
 Young & Loosdale, Herne Hill ..... £276 5 0

**NOTTINGHAM.**—For the erection of new Epidemic Hospital, for the Town Council of Nottingham. Mr. Arthur Brown, M. Inst. C.E., Borough Engineer, architect. Quantities supplied:—  
 R. Hockley, Grantham ..... £27,125 0 0  
 J. & W. Paterson, Sleaford ..... 24,750 0 0  
 Barlow & Whitaker, Nottingham ..... 23,330 0 0  
 J. J. Adams, Nottingham ..... 23,130 0 0  
 Bell & Sons, Nottingham ..... 22,958 0 0  
 Lowe & Sons, Burton-on-Trent ..... 22,700 0 0  
 E. Messon, Nottingham ..... 22,637 0 0  
 W. Bisset & Sons, Sheffield ..... 22,439 0 0  
 Henry Vickers, Nottingham ..... 22,200 0 0  
 James Wright, Nottingham ..... 22,095 0 0  
 Holson & Son, Nottingham ..... 21,799 0 0  
 J. F. Erice, Nottingham ..... 21,491 0 0  
 Evans & Woodcock, Nottingham ..... 21,178 0 0  
 John Cooper, Nottingham ..... 21,050 0 0  
 Enoch Hind, Nottingham ..... 20,797 0 0  
 Joseph Shaw, Nottingham ..... 20,715 0 0  
 Wheatley & Maule, Nottingham ..... 20,476 0 0  
 \* Accepted.

**PETERSFIELD (Hants).**—For the erection of a house and shop at Petersfield, for Mr. D. E. Hobbs. Ironwork provided by owner. Mr. John Chadwick, C.E., architect, Petersfield:—  
 W. Mould ..... £314 12 0  
 J. Gammon & Son ..... 289 0 0  
 H. Woods ..... 208 0 0  
 A. Patrick (accepted) ..... 240 10 0

**REIGATE.**—For the erection of two houses at South Park, Reigate, for Mr. Harnden. Messrs. E. & C. H. Burrow, architects, Horsham and Horley:—  
 Rowland Bros., Horsham ..... £789 0 0  
 Alf. King, Burslow ..... 745 0 0  
 C. Nightingale & Sons, Reigate ..... 730 0 0  
 A. Watkins, Charnwood ..... 695 0 0  
 T. D. Heathfield, Reigate ..... 687 0 0  
 J. Brown, Horley ..... 613 0 0

**ROGATE (Sussex).**—For the erection of two detached villas at Rogate, for Mr. C. G. Roberts. Bricks and tiles provided by owner. Mr. John Chadwick, C.E., architect, Petersfield:—  
 J. Jenkins ..... £590 0 0  
 J. Gammon & Son ..... 898 0 0  
 J. Blackmore ..... 888 0 0  
 H. Woods (accepted) ..... 750 0 0

For Water Tower.  
 J. Jenkins ..... 80 0 0  
 J. Blackmore ..... 80 0 0  
 H. Woods (accepted) ..... 67 10 0  
 J. Gammon & Son ..... 62 0 0

**RUSHDEN (Northants).**—For the extension of Messrs. Cave & Son's factory, Rushden, Northants. Mr. H. A. Cooper, architect, Rushden. Quantities by the architect:—  
 D. Ellwood & Son, Sandy, Beds. .... £3,619 0 0  
 H. Sparrow, Rushden ..... 3,490 0 0  
 Clayton Bros., Cockney, Northampton ..... 3,300 0 0  
 Freeman & Son, Denford ..... 3,290 0 0  
 J. T. Wingrove, Northampton ..... 3,279 0 0  
 E. Marriot, Wellingboro' ..... 3,279 0 0  
 G. Dawkins, Wellingboro' ..... 3,250 0 0  
 G. Benson, Wellingboro' (accepted) ..... 3,225 0 0  
 E. Brown & Son, Wellingboro' ..... 3,197 0 0  
 F. Barlow, Rothwell ..... 3,170 0 0  
 E. Barlow, Rothwell ..... 3,150 0 0  
 J. Slinn, Wellingboro' ..... 3,100 0 0  
 Berrill Bros., Rochester ..... 3,098 0 0

**RUSHDEN (Northants).**—For the erection of new factory, Park-road, Rushden, Northants, for Mr. F. Knight. Mr. H. A. Cooper, architect, Rushden. Quantities supplied by architect:—  
 J. T. Wingrove, Northampton ..... £1,891 0 0  
 W. Coates & Son, Thrapston ..... 1,850 0 0  
 Freeman & Son, Denford ..... 1,840 0 0  
 R. Marriot, Wellingboro' ..... 1,825 0 0  
 G. Dawkins, Wellingboro' ..... 1,775 0 0  
 H. Sparrow, Rushden ..... 1,747 0 0  
 C. Bayes & Son, Rushden ..... 1,734 0 0  
 Admit & Everard, Rushden ..... 1,730 0 0  
 G. Benson, Wellingboro' ..... 1,720 0 0  
 A. Barlow, Kettering ..... 1,694 0 0  
 Clayton Bros., Cockney, Northampton, accepted ..... 1,647 0 0



**SHEET (Hants).—**For the erection of a house and shop at Sheet, for Mr. A. Hill. Mr. John Chadwick, C.E., architect, Petersfield:—  
 R. Pocock ..... £34 0 0  
 E. Finch ..... 857 17 0  
 H. Woods ..... 835 0 0  
 J. Holder & Son ..... 798 0 0  
 W. Mould ..... 790 0 0  
 J. Gammon & Son ..... 698 0 0  
 A. Patrick (accepted) ..... 679 0 0

**SOUTHAMPTON.**—For repairs and decorations, Portland Baptist Church. Mr. W. H. Mitchell, architect:—  
 H. Stevens & Co. .... £794 0 0  
 A. Ward ..... 785 0 0  
 T. J. Jukes ..... 780 0 0  
 H. J. Sanders ..... 769 0 0  
 J. J. Udall ..... 708 0 0  
 J. W. Rowland & Sons (accepted) ..... 717 10 0  
 [All of Southampton.]

**SOUTHERN.**—For new roads, sewers, &c., for the British Land Company, Limited, on their estate at Southsea. Mr. Henry B. Michell, surveyor:—  
 Lewis ..... £1,862 4 0  
 Ward ..... 1,880 0 0  
 Quick & Son ..... 1,799 0 0  
 Light Bros. .... 1,748 0 0  
 Cork ..... 1,740 0 0  
 Hall ..... 1,730 0 0  
 Carter & Co. (accepted) ..... 1,701 0 0

**STREATHAM.**—For alterations to and generally completing the Town Hall, for Mr. E. H. Thompson. —  
 Arthur M. Deacon, West Norwood  
 and Hayward's Heath (accepted) ..... £2,600 0 0  
 [No competition.]

**TWICKENHAM.**—For alterations and painting, 3, Prospect-villa, Hampton-road, for Mr. Charles Gordon. —  
 Young & Lonsdale, Herne Hill ..... £141 10 0

**UPTON ST. LEONARDS** (Gloucestershire).—For works to church. Messrs. Waller & Son, architects, College-green, Gloucester:—

A. King, Gloucester ..... £1,298 0 0 ..... £189  
 Billings, Cheltenham ..... 1,147 0 0 ..... not sent.  
 J. Clutterbuck, Gloucester, 1, 95 10 0 ..... 220  
 Drew Bros., Chalford ..... 880 2 7 ..... 70  
 Wall & Hook, Brimscombe\* ..... 841 3 7 ..... 91  
 \* Accepted.

**WHITBY.**—For erecting three cottage villas, Uppang-road, Whitby, for Mr. F. Hume. Quantities by the architect:—  
 T. Clarkson ..... £2,812 0 0  
 C. Winterburn ..... 2,634 0 0  
 Lanesdale & Son ..... 2,693 0 0  
 J. Gladstone ..... 2,519 0 0  
 J. White (accepted) ..... 2,500 0 0  
 [All of Whitby.]

**WIMBLEDON.**—For the erection of a house at Wimbledon Park, for Mr. Percy Mortimer. Mr. John Nicholls, architect, 8, Craig's-court, Charing-cross, Messrs. Goodman & Simpson, surveyors, 9, Buckingham-street, Strand:—  
 B. E. Nightingale ..... £3,457 0 0  
 Harmer, Wimbledon ..... 3,418 0 0  
 J. Tyerman ..... 3,212 0 0  
 Perry & Co. .... 3,197 0 0  
 Bovis & Co. .... 3,175 0 0  
 Townsend & Son, Wimbledon ..... 3,100 0 0

#### TO CORRESPONDENTS.

R. P. T. C. N. H. D. C. J. C. B. (thanks).—G. F. T. J. H. (it is not our business to answer silly and useless questions).—W. H. B. J. M. B. D. F. B. B. B. C. C. C. C. H. W. (shall have consideration).—H. E. (drawings and letter both left without any address to reply to).—J. E. (no space).—W. B. (rather amused). We have, I. P. there is no probability that any of your contributions would be acceptable).—G. L. I. Co. J. A. T. (it is no part of our business to act as amateur valuers, especially without seeing what we are invited to value).—O. H. B. (we printed the list as we received it. The mistake is too small to return to you).—I. F. (take it as no more rule of 18th. brickwork, and allow from 17 10s. to 21. 10s. per rod for ties across the cavity, according as they are bricks or patented iron).  
 All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses.  
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 We cannot undertake to return rejected communications.  
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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock P.M. on THURSDAY, and for the front page by the same hour on WEDNESDAY.

**SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY mornings.**

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisement, and strongly recommends that of the latter COPIES ONLY should be sent.

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Deal Dadoes, from 1s. 2d. per ft. super.  
 Oak Dadoes " 1s. 8d. "  
 Walnut Dadoes " 1s. 11d. "  
 Oak, 1 inch Parquet Floors, laid and polished, from 27. 10s. a square.  
 Solid 1-inch Oak, straight boards, laid and polished, at 28. 18s. a square.  
 Solid 4-inch Oak Parquet for covering Deal floors, laid and polished, from 25s. a square.  
 Oak Wood Tapestry Dadoes, from 1s. per foot super.  
 Walnut or Mahogany, from 1s. 3d. per foot super.  
 Ditto with Heavy Mouldings, 4d. ft. extra.  
 Ditto, ditto, with Carved or Painted Panels, prices according to sketches.

Prices given for all Interior Work, Doors, Architraves, Over-doors, Chimney-pieces, Stoves, and Hearths. Architects and Surveyors' attention particularly called to the above Quotations for

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Tender for Contracts for any Joiners' work, or Ornamental Plaster. Painting, Plain or Decorative, Wrought-Iron Work, Stained, Cathedral Glass, and any other Interior Work.

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# The Builder.

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SATURDAY, JUNE 8, 1899.

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### The Electric Lighting of London.

**T**HE recent report of Major Marindin to the Board of Trade in reference to the applications made under the Electric Lighting Acts of 1882 and 1888 for provisional orders and licences is causing considerable discussion in electrical circles, and is being submitted to much severe criticism.

The immediate future of the electrical industry in this country is so dependent upon the action which will be taken by the Board of Trade, and upon the extent to which it will adopt the views officially expressed by Major Marindin and Cardew, that we propose at a later date looking more fully into the evidence produced at the inquiry and giving somewhat close attention to the statements, frequently contradictory, made by the experts called on behalf of the various petitioning companies. It is clearly only just to the public that, before a company is entrusted with the lighting of any given district, it should be called upon to show that it is in a position sufficiently strong, financially and in other respects, to carry out the work it proposes to do. On this point Major Marindin has been satisfied in all cases save one,—namely, that of the Electrical Power Storage Company. As in connexion with this company the report has been criticised as being harsh and unfair, we will allow Major Marindin's words to speak for themselves. They are as follows. After referring to the opposition of the local authorities, the report goes on to say:—"It is perfectly clear from the evidence of the manager of the company that the company does not intend to exercise the powers which would be granted by the order, but to transfer them to some other persons. I have no doubt that these persons are perfectly willing and competent to carry out the powers and obligations of the order, but I submit that it would be quite contrary to practice to grant an order to any but a properly-constituted company, proved to be in a position to act under it, and as this has not been done, I cannot recommend that the order be granted."

With this view we must say we cordially agree. We presume that had the order been granted, the Electrical Power Storage Com-

pany would have made arrangements satisfactory to itself with the "other persons" alluded to in the report, or else it would have let these "other persons" apply for the order themselves. The immediate transference of an order as soon as obtained, in the way here suggested, reminds us too vividly of the sale of "concessions for patents" in the early days of electric lighting to permit us to characterise the words of the report as being either harsh or unjust. Whilst the Board of Trade should be influenced by no factious opposition to any body or bodies applying for powers, it will do well to err on the side of severity in dealing with any case that recalls the old days of the promoter—days which all who are truly interested in the progress of electric lighting must sincerely hope will never return.

In dealing with this great work of electric lighting and electric distribution, if it were merely a question of finance which had to be solved, the solution would be simple enough; but it is more than that,—it is a question also of "system." Most electric lighting companies have adopted one of two systems to which they pin their faith, and we have now the satisfaction of knowing that a very careful examination has been made into the capabilities of each of these systems. With respect, however, to expert evidence at examinations of this nature, those of our readers who have ever followed the accounts of any trial in which technical interests are involved must be aware of the difficulty in deciding the merits of particular cases, where experts are called, not as they should be, by the examining body, but by those examined. The importance of making totally distinct the functions of the expert witness and those of the advocate is so fully recognised that we cannot understand why the older methods of obtaining technical evidence at such inquiries are still retained.

It may not be out of place here to remind our readers as to what the salient points of the two systems involved really are. It must be borne in mind that when an incandescent lamp is giving out its light, a certain quantity of electricity is being forced through the little carbon filament at a certain pressure; and that, just as a given power can be got from a steam-engine by forcing through it a small quantity of steam at a very high pressure, or a proportionately larger quantity of steam at a low pressure, so can we get the same work out of the electric current by increasing its pressure, measured in volts, and lessening its quantity, measured in amperes, or *vice versa*.

For domestic purposes, however, electricity cannot be used at present at more than a comparatively low pressure.

The difficulty which has to be faced by the electrical engineer is not the production of the electric current at the central station, nor its use in a house or factory, but the means of getting it from where it is produced to where it is used. To carry a large current requires a large cable,—that is, a cable containing a large quantity of copper. If, therefore, a company attempted to supply current direct from its generating station to buildings scattered over a wide area, at such a pressure as could be safely introduced into buildings, the amount of capital buried underground in the form of copper cable would render the experiment a costly and prohibitive one. Fortunately, however, the carrying power of copper is unaffected by electrical pressure, so that, if the pressure is raised to a very high amount, the current can be proportionately reduced, and the cables be made correspondingly small, without in any way reducing the amount of electrical energy transmitted. If this all-important underlying principle is fully understood, the further elucidatory details of the question follow easily enough. Indeed, the London Hydraulic Power Company is adopting the very same principle when it uses in its mains for the transmission of power a very small quantity of water at a very high pressure, as may have been remarked by those who have noticed the comparatively tiny pipes laid down in certain Metropolitan roadways.

The "continuous-current" system and the "alternating-current" system have now become familiar expressions: in the former the electricity flows steadily in one direction through the copper of the conducting wires or cables; in the latter, the electricity pulsates back and forth like the piston of a steam-engine, altering its direction one hundred or more times each second. For use with this alternating-current there has been devised a very beautiful piece of apparatus called a "transformer" or "converter." Through one part of this apparatus flows a small current drawn from the street mains at a very high pressure; from another part there flows a much bigger current at a low pressure which can be used for ordinary domestic lighting. The transformer or converter has no moving parts to get out of order, and, except for ordinary deterioration of material, may last for an indefinite period. It would thus seem that by means of the alternating-current,



together with the converter, the problem of transmitting the electric current in a practical and satisfactory way has been solved.

To fully appreciate the work of a converter, it may be instructive to take an example. Suppose a particular area requires 40,000 lamps, each lamp taking  $\frac{1}{2}$  ampere of current at a pressure of 100 volts; that is, 20,000 amperes of current are required. If this amount of lighting were undertaken by, say, the London Company, from Deptford, a current at 10,000 volts pressure would be sent from Deptford to London, where it would be converted at a distributing-station into a current five times as great under a pressure of 2,000 volts. From the distributing-station the current would be conveyed to the buildings to be supplied, where it would be converted into a current twenty times as great, under a pressure of 100 volts. Now  $20 \times 5 = 100$ , and  $20,000 \div 100 = 200$ , so that by sending a comparatively small current of 200 amperes from Deptford to London, it is ultimately converted into a current of 20,000 amperes for use for lighting purposes. It may be remarked that in the foregoing calculations no allowance has been made for certain losses which inevitably occur, but as these amount to a very small percentage of the whole, we need not complicate the calculation by their introduction. These details of calculations may be somewhat tedious, but we venture to think they will enable some of our readers to more fully realise what can be done by recent electrical appliances.

It is in this property of easy conversion that the peculiar value of the alternating-current lies. There are, it is true, ways of converting the direct current, but, so far, they have never got beyond the experimental stage; when a continuous-current can be converted and distributed as easily as an alternating one, the alternating system will have to develop new virtues to prevent itself being beaten from the field.

There is, however, a reverse side to this consideration of the transformer system, and in a letter from Professor Sylvanus P. Thompson, in the *Times* of the 1st inst., he appears as the opponent of the alternating-current. For our own part, we are the exclusive advocates of neither system. Professor Thompson is the avowed champion of the continuous-current, and, as all enthusiasts are apt to do on occasions, he has in this case, we think, allowed his pen to run away with him. He points out that the alternating-current cannot be stored in accumulators. This we grant, and we own that this is a very distinct point in favour of the continuous-current, which can be so stored. He then proceeds to say, "It lives from hand to mouth . . . A mere derangement of an engine or a boiler may, in the absence of storage, plunge a whole district into darkness." Here we join issue, for does Professor Thompson seriously believe that a company lighting a whole district on the alternating system would do so with one boiler, one engine, and one dynamo-machine? We do not believe he can really think so. For example, in the House-to-House station at West Brompton there are already a battery of boilers, three independent steam-engines, and three independent dynamo-machines; the whole plant is interchangeable, and the capacity of the station is greatly in excess of the maximum output at present required. If a boiler, engine, or dynamo broke down, the remaining plant would do all the work, and if the public outside noticed anything wrong it would only be a momentary flickering or unsteadiness in the lights. Storage is unquestionably a great thing, but with spare plant in case of breakdowns it can undoubtedly be dispensed with.

Much more important is the question of distributing motive-power, about which we must now say a few words. Up to the present no really workable alternating-current motor has been produced; while, on the other hand, many exceedingly efficient motors are working in this country with the continuous-current. Owing to this disadvantage, it is recommended in the report that where two

companies are given powers over the same area, one, at all events, shall supply the continuous-current. The idea at first sight appears to be that if a particular householder after lighting his house from converters wishes to use a motor, he can do so by getting a continuous-current from the mains of another company. But Major Marindin appears to have forgotten that in a previous part of his Report he says: "Where there are two companies in the same area, different streets should be scheduled for each." We must confess there seems some little contradiction here. Later on in the report we learn "that, in the abstract, competition is desirable, as tending to keep down the price, and to cause the manufacture and supply of electricity to be carried on with all the attention and energy which it is possible to devote to it." In the first place, if but one company can lay its mains in a particular street, we fail to see how any person living in that street can benefit by the competition of another company which is not allowed to carry its mains there. Secondly, if the question of motors is in the position implied in the report, it seems very hard that a house on the line of supply of the alternating company can obtain no motive-power, whilst a house in the very next street, fed from a company working the continuous system, can get all it requires. Such arbitrary restrictions as these are unworkable, and the County Council and Board of Trade must be looked to for their rectification by other means than those suggested in the report.\*

For our own part, we are inclined to think the solution will come from an entirely different quarter. So rapidly is electrical engineering progressing, that only last week Mr. Mordey was showing one of his alternating-current machines running as a motor and delivering fifty horse-power. Owing to defects we cannot now go into, such a motor is impracticable for general use; but a start has been made, and we predict that the production of a motor to work thoroughly well with an alternating-current is only a question of time, and that not far distant. This being so, that part of the report based on the assumption that no alternating-current motor exists will very soon cease to have any value.

It appears to us that people in general altogether fail to appreciate what a stupendous matter the general distribution of motive-power by means of the electric current really is. The present companies, it is well known, have hardly sufficient capital to cope with the lighting which they will at once be called upon to undertake. If, then, the opinion of those who ought to know is correct, namely, that far more electrical energy will in the near future be required for power than for lighting, it is mere waste of time to discuss the question of motive-power being supplied by the companies as they are at present constituted.


It is more than probable that just as there are different mains for supplying water for domestic purposes and for power purposes, so there may have to be different mains for supplying electric currents for light and for power. The question of the method of laying such mains is a difficulty which will have to be faced. The inconvenience of having our busy streets continually upturned for the laying of all sorts of electric mains is not one to be lightly encountered, and its magnitude will, it is hoped, lead to its early and thorough consideration. It must be remembered, however, that there is no comparison between an electric main and the huge gas or water mains buried under London streets. A small conduit at the edge of the footway, made easily accessible from the surface, would carry a dozen electric mains for different purposes. The road must be taken up to make the conduit, but if such conduit is the property of the local authorities it could be rented by the companies wishing to use it.

It will be seen from the foregoing considera-

\* The London County Council, it may here be mentioned, at its meeting on Tuesday resolved to address a letter to the Board of Trade agreeing, in the main, with Major Marindin's Report. To this letter we may have occasion to return.

tions that the electric lighting and power distribution for London presents difficulties of no mean magnitude. It is to be hoped that those on whom the duty falls will give them the careful consideration they merit.

#### THE REVIVAL OF PLASTER.

 E live in an age of revivals in architectural work; we have had revivals of great styles, Greek and Gothic, and so on; and revivals of decorative methods, fresco, and mosaic and wrought-iron; and it would be surprising if plaster, which lends itself so easily to decorative purposes, did not come in for its turn. Such a revival has been a more or less obvious fact for some time past, but Mr. Champneys made a distinct and definite demonstration in its favour by his paper read before the Institute of Architects on Monday evening.

In nearly all that Mr. Champneys said in regard to the treatment of plaster when used in a decorative manner (which will be found in substance in another column) we are disposed to agree; but we do not know that it is altogether desirable that people should be distinctly encouraged in the use of a material which, as a cheap and easy medium for decoration, human nature is in its unregenerate state, only too prone to. It must not be allowed to be forgotten that, after all that can be said concerning the blandishments of plaster, it is after all only a *pis aller*, a substitute for something better which we would have by preference if we could afford it. Plaster is convenient and inexpensive for modelling statues in, but no one pretends he would have a plaster cast if he could afford the marble; nor does any one pretend that he would have modelled plaster decoration if he could have it carved in wood or alabaster or marble. It is a convenient covering for masking the rough wall surface in an interior, but it is not an agreeable one; it makes a great mess in putting it on; the very atmosphere of a plasterer's workshop is enough to give one a distaste for the trade; and for town houses it has the defect of holding a great deal of dirt and not being very easily cleansable. No one would have plaster for the covering of the walls of his sitting-room if he could have oak wainscot or marble inlay, or decorative faience, or almost anything else. The greatest objection of all is its perishable nature, especially in regard to decorative work; to depend on plaster for any of your architectural detail is at once to introduce into your building a substance which is the reverse of monumental. For this reason we think that those purists of the Gothic revival who took up a crusade against plaster and regarded it as a thing not to be tolerated in the best work, and only in any case to be endured as an unavoidable evil, were by no means as far wrong as Mr. Champneys and others of the modern school would make out. The crusade was carried to excess, no doubt, especially when rough stone walls of random courses were stripped of their plaster covering by the pious restorer, and their nudity accentuated by black pointing in the joints, giving the appearance of a gigantic spider having woven rope-like cobwebs over the walls. This was bad, and there is no doubt that some rough walls have been thus uncovered which were never meant to be seen. But this was cheap building; in fact, the plaster was used to cover it just as modern builders used to use cement to cover bad brickwork; the fact is no better in Medieval than in modern days. Any one would rather have good and finished stonework or brickwork as an inside finish to a church, than plaster; and we have known people who would rather have brickwork (of a superior stamp of course) as the lining of a house. Still, plaster is useful for an internal finish that is warm, fairly slightly (or may be made so) and inexpensive, and therefore it is not surprising that its use in one form or another should be traced among so many different people of different ages.

But when we come to use plaster decora-



tively, it is, to say the least, a terrible snare. Its fatal facility of being modelled has tempted so many misguided people into trying to give it the depth and force of carving; building it up on brackets to give it an artificial relief which the substance is really not capable of supporting, as in the terrible example which Mr. Champneys mentioned at Audley End, where masses of the stuff are hung downwards from a ceiling in mimicry of the pendants of Tudor vaulting. One cannot look at such things without thinking of Bishop Blougram's criticism after he had been preaching in "that masterpiece of Brother Pugin's"—

"I doubt if they're half baked, those chalk rosettes, Ciphers and stucco-twiddlings everywhere; It's just like breathing in a limekiln."

The greatest reticence is to be observed in the use of plaster. In regard to the place where plaster decoration may most fitly be applied, an eminent English landscape painter has expressed the opinion that ceilings ought to be white, as reflectors of light down into the room. Plaster is the easiest way of getting a white ceiling; and when it is there for that practical purpose, why not decorate it? Mr. Champneys' paper practically took the same line, as it dealt almost entirely with ceiling decoration. He complained that ordinary king-post roofs, not decorative and never meant to be seen, had been deprived by restorers of their judicious plaster ceiling and left "plain in their neatness" (as Milton translates "simplex munditiis"). We agree that when the roofs had been constructed with the intention that they should be "under-drawn," it is a piece of Quixotism to remove the covering. But we protest against the assumption that a king-post timber roof is essentially a thing not fit to be shown. It is capable of effective treatment, and has the merit of being very satisfying to our perceptions of constructive stability. It is not to be regarded as only fit for architectural treatment by covering it with a plastered screen. That is putting the accidental before the essential.

Granting that the ceiling is the suitable, or the most suitable place for plaster decoration, we concur in most of what Mr. Champneys laid down as the best method of treating it. Keeping modelled design in very low relief is one of the most important points. As soon as the relief becomes such that you know that there must be special artificial means of holding the plaster up, the thing becomes an offence to our sense of fitness. The suggestion that ceiling decoration, if it leads in any one direction, should lead from the sides to the centre, and not from the centre to the sides, was supported by a good reason. Wall decoration naturally tends to take a vertical character or movement, from the base towards the cornice; and an opposite movement on the ceiling, from the centre to the side, meets the wall decoration awkwardly. Treated the reverse way, it rather suggests the carrying up of the wall decoration into the ceiling, which is much more harmonious in effect. This is true, and it has been a good deal overlooked. Still, it can hardly be made a rule absolute. If, however, the design is made to lead from the centre towards the sides, it should be stopped short of the sides, either by a neutral ground of bare space, or by a strongly-marked border which will entirely divide the ceiling decoration from the wall decoration.

Mr. Champneys thinks that rectangular patterns "militate against repose" in a ceiling. If he means that sort of rectangular pattern which consists in making imitation coffers with panels between, we do not say that these militate against repose; their fault rather is that they suggest a solidity and massiveness of construction which does not really exist. A coffered ceiling of solid construction is a grand thing; a baked imitation in soft material is very much the reverse.

And this brings us to a criticism in regard to plaster-ceiling decoration which we wish to emphasise. A large proportion of what are otherwise the best designs for ceilings, old and modern, consist of a decorative basis of broad bands in relief, having more or

less suggestion of a constructive framing, with lighter treatment in the interspaces. Almost every "design for a plaster ceiling" one sees in the Architectural Room at the Academy has this basis. This is certainly a mistake in the treatment of plaster. It is an imitation of the stile and panel system of door-construction, which is natural and legitimate there, because it is the real and the best construction. But to build up a framework of this kind on an expanse of plaster is a treatment for which the material offers no suggestion. The real origin of it is the desire to save trouble in designing surface ornament. A designer who feels unable to sweep over a whole ceiling with a surface design is quite able to cope with a small panel. So he divides the work up into small panels, which are within easy grasp.

As a general rule (and here Mr. Champneys seems to be with us), a plaster decorative ceiling design should be as much as possible an "all-over" design. The only exception is when the actual construction is panelled. Then the plaster design ought to follow it. We might perhaps suggest another application of this principle. Mr. Champneys referred to the often-observed fact of the lines of joists showing white through a plaster ceiling, and offered the probably correct explanation that it arose from dust being carried by the movement of the air through the plaster, and settling in it, more freely in the interspaces than where the joist was at the back of the plaster. But this may really be a hint from Nature to the designer (for the carriage and settlement of dust is an operation of natural forces) to think of the construction in decorating his plaster surface. "The real construction is that of a series of parallel joists. If you do not recognise that in treating your plaster, I will do it for you, in my own way." A decoration following the lines of the joists would obliterate the natural effect complained of. Perhaps some one may be inclined to try it.

#### NOTES.

**T**HE International Congress of Architects, to be held at Paris under the auspices of the Société Centrale des Architectes, will open on Monday the 17th, and close on Sunday the 23rd of this month. The opening and closing general meetings will be held at the Trocadéro Palace, the others in the Hémicycle des Beaux-Arts. There will be a banquet at the Hôtel Continental on Saturday the 22nd. The main subjects dealt with by the Congress will be (1) "Enseignement"; (2) "Assistance Confraternelle"; (3) "Propriété Artistique"; (4) various questions which may be treated according to arrangement; among these are put down "Architectural diplomas," "Public Competitions from the architectural point of view," and the "Honoraires" of architects and experts. Under the first head M. Garnier will treat of "The Education of the Architect"; MM. Émile Trélat and Paul Gout will deal further with the same subject; M. E. Guillaume will speak of Architectural Education as it is at the École des Beaux-Arts; M. Achille Hermant on Jurisprudence in connexion with Architectural Education; M. Daly will read a paper on "Hautes Études" in architecture; M. de Baudot on reforms to be introduced into Architectural Education; and M. Charles Lucas on the practical education of the "Personnel du Bâtiment." Among various subjects, papers are promised on Etruscan Art, by M. Eugène Dognée, of Liège; on the Cupolas of the East and West, by M. Alphonse Gosset, of Rheims; on the heating system of ancient baths, by M. Boussard; and on fires in theatres, by M. Chenevier, of Verdun. All information can be obtained from the secretaries, MM. Chas. Lucas and Eugène Müntz, at 28 Rue Serpente, Paris.

**T**HE dreadful catastrophe in the Connaught Valley in America, by which thousands of lives have been lost, was no doubt

intensified by the swollen state of the rivers from excessive rainfall, and it may be said that the rain was also indirectly the cause of the central calamity of the bursting of the dam, by its combined action in increasing the volume of water in the reservoir and saturating the material of the dam itself, and that the dam might have been safe for the present but for the exceptional rain. This, however, does not alter the fact that we have in this event one more example of the fatal imprudence of storing up an enormous volume of water with no other curb to it than the mere bulk of an artificial embankment of earth, with perhaps a centre of puddled clay. We have not yet had any particulars as to the construction of the dam, but we make no doubt that it was one of these earthworks, such as proved fatal at Sheffield a good many years ago, under somewhat similar circumstances of exceptional weather. The lesson of the catastrophe is that if such immense masses of water are to be held up at a height over an inhabited district by an artificial barrier, it should be a barrier impervious to the action of water, at whatever increase of initial cost this has to be accomplished. We doubt if this can really be efficiently done except by a built barrier with buttresses and horizontal arches and a backing of concrete in hydraulic lime. The expense of such a construction is very great, of course, but the awful result of the failure of the Connaught barrier is a lesson that it is almost sinful to count the cost in such a case. We hope that some details as to the construction of the dam, and who was responsible for it, will be forthcoming in due time.

**A**S our readers are aware, the decision of the Court of Queen's Bench, in the matter of the St. Paul's reredos, has been, by a majority of two out of three judges, that a rule should be granted for a *mandamus* to the Bishop to take action on the case; which however, will be delayed pending an appeal. About the legal position of the case we of course do not say anything, especially as there is to be an appeal; but as to the general merits of the reredos itself we confess to feeling a good deal of sympathy with some of the expressions in Lord Coleridge's judgment; nor can we entirely sympathise with those who say "What a pity if it should be removed after all this labour and expense!" &c. We do not think it is likely to be removed; but in some senses it might be a useful lesson if it were. Even in regard to the ritualistic or religious question, on which we express no opinion whatever, it does not seem a very gracious or agreeable kind of proceeding to get up in secret and behind a screen something which it was well known would cause religious offence to many people; and there is no doubt that this was the case; in fact the reason was given as an excuse for not publishing an illustration until the reredos had been got into position. The important objection to our mind is the architectural objection, which is not the business of the court, but which Lord Coleridge hinted at in his remark that the reredos had shortened the cathedral by 40 feet. What is worse than this is the utterly unarchitectural expedient of putting a semicircular reredos in front of a semicircular apse, absolutely wasting the apse behind, and leaving it a shapeless space unavailable for anything; and the bungling way in which the cornice of the reredos has been thrust into the middle of one of Wren's pilasters, without the slightest attempt at architectural coherence. These seem to us blunders of which any architect ought to be ashamed; and the more so since they were done entirely without any consultation of the wishes of the "Surveyor" to the Cathedral, whose official position and professional *prestige* alike ought to have entitled his judgment in such a matter to respect.

**T**HE appeal of the Royal Academy against the judgment of Mr. Justice North in regard to the true meaning of the terms, of the Chantry Bequest as affecting works of sculpture has been dismissed. As will be



remembered, the terms of Chantrey's bequest were that completed works were to be purchased, but that no commissions were to be given. The Royal Academy argue that as far as regards sculpture this seriously ties their hands, as few sculptors can afford to execute works in monumental materials. The Master of the Rolls, one of the three judges before whom the appeal was heard, summed up in favour of the Royal Academy, arguing that they were bound to use any "artful skill" they could in putting such a construction on the testator's words as "would not defeat what every one who understood art must know was the object of the testator." The two other judges, however, Lord Justice Cotton and Lord Justice Fry, ruled that the terms of Chantrey's will were clear, and could not be set aside. They certainly appear to us to be so; nor can we by any means agree with those who conclude that Chantrey did not mean what his words express. If he had not been a sculptor it might have been different: but being a sculptor, and being perfectly familiar with the fact that sculptured works were modelled before they were carved, he nevertheless made no exception to the condition of his bequest which forbade ordering works on commission. Chantrey must surely have known what he was about when he made this provision, and we do not see that either artists or lawyers have any right to conclude the contrary. It may have been an object in his mind to encourage the production and exhibition of sculpture in monumental materials rather than in plaster.

THE excavations in the Acropolis have for the last year or two completely eclipsed the glory of the Pergamos discoveries. It is satisfactory, however, to find that the work of the restoration of the sculptural slabs of the great altar still goes on steadily, and is, in fact, approaching completion. The *Berliner Philologische Wochenschrift* of May 23 last publishes a sketch of the order of the restoration, from a diagram which was laid before the last meeting of the Berlin Academy of Sciences. The diagram was by Dr. Puchstein, but in his absence was explained by Dr. Conze. The figures of Ares, Herakles, and Hera are as yet missing, but the restorer is not without hope that they may be made out from the fragments yet to be identified. It is impossible, of course, to describe the relative positions of the various gods (fifty in number); the diagram itself must be consulted by those interested in the disposition, but it must be noted that the final positions assigned to the Zeus and Athene groups (of which there are casts in the South Kensington Museum) are at the back of the altar,—not, as might have been expected, in some prominent and central place to the front.

IN the last issue of the "American Journal of Archaeology" (vol. v., plate 1), there appears a phototype reproduction of the archaic stele recently found at Dionuso, in Icaria. Of course the main interest of the excavations there has been, as we have pointed out before, the identification of the deme Icaria, and the long series of choragic inscriptions; but incidentally the excavators have come on many interesting sculptured fragments, and foremost among them is the stele in question. It is even on the first glance closely analogous in style to the famous stele of Ariston, long the standard specimen of archaic sepulchral art. The Icaria stele, while carefully maintaining the same type, is of slightly more advanced work, and this presents many interesting points of comparison. The stele is in all its aspects most carefully discussed by Mr. Carl D. Buck, a member of the American School. On Mr. Buck fell all the heavy end of the daily supervision of the Dionuso excavations, and we are glad that the publication of some of the sculptures found falls to his share.

THE Board of Trade have now a more definite idea of the magnitude of the task involved in dealing with the protests against the proposals of the railway companies under the new Act. The extension of

the time allowed for making objections has evidently been thoroughly appreciated, as no fewer than 3,000 such objections had been lodged with the Board of Trade by Monday last. Of course, there has not yet been time to classify them in any way,—a large number having come in almost at the last moment,—but, when this can be done, many will doubtless be found practically identical. Sir Michael Hicks-Beach was asked on Tuesday what arrangements would be made for hearing objections, and he stated in reply that an attempt would first be made to clear the ground by settling such points as could be agreed upon with the railway companies. The latter have been requested to arrange for sending their representatives to set forth their views, and every effort will be made to reduce the number of disputed points. All these preliminaries will take up a good deal of time, and several months may possibly elapse before objectors are called upon to argue their cases. In the meantime, a suggestion was made in the House of Commons on Tuesday that inquiries should be held in the large towns in the centre of affected districts, and we believe that something of this kind is in contemplation.

PUBLIC companies generally reserve to themselves the right "to do all such things as are incidental or conducive to the attainment of the objects for which the company is established." This comprehensive clause is sometimes stretched until the operations of the said company includes undertakings apparently altogether outside the original one. Railway companies have thus engaged in a good many industries besides that of "carrying," having become proprietors of hotels and refreshment-bars, omnibuses, and steamers. Their omnibuses convey the general public (if there is room) as well as railway passengers, and are accordingly detested by the other "lines"; while the shipowners are equally resentful against the continually increasing number of vessels flying a railway company's flag. The indignation of the shipowners has been recently increased by the introduction into Parliament, by the Manchester, Sheffield, and Lincolnshire Railway, of a Bill seeking additional powers for working steamboats, and culminated in a meeting held last week at the London offices of the General Steam Navigation Company, at which the following resolution was carried:—

"That this meeting strongly protests against any additional powers for working steamboats being granted to the M., S., & L. Railway Company, and other companies, by Parliament. That competition by the steamship owners, which is so essential in the interests of the public, must sooner or later cease in the face of the abuse, by the railway companies owning steamboats, canals, docks, or harbours, of the unlimited power they possess to maintain a ruinous competition by sea, such only being possible by reason of the unduly high rates they charge for the land services, of which Parliament has granted them the monopoly."

This is a rather strong indictment, and the shipowners intend to follow it up by asking the Prime Minister to receive a deputation in order that these matters may be fully laid before him. It is always a matter of regret when one industry interferes with another,—especially when the offenders are already monopolists in their own more strictly legitimate business,—and the shipowners have adopted a line of argument which is certain to secure for them a considerable amount of sympathy.

THE earthquake of Thursday, the 30th ult., which was felt in many of the towns on the south coast of England and on the seaboard of the north of France, abundantly testifies to the truth of several observations made in our article of the 11th ult. on the effects of earthquakes on buildings. No doubt the reason why the shocks were more severely felt in the houses on the borders of the Channel than elsewhere was due to marginal vibrations, as therein explained. The greater number of the records of the disturbance in the Metropolis show that it was very slightly felt, chiefly in

the uppermost stories of high buildings, and we have had reliable information from one correspondent that it was most distinctly felt on the top floor of a three-storied building situated at the end of a long terrace, which, as we have shown, is one of the most dangerous positions for a building to occupy with reference to an earthquake. The motion consisted of four or five horizontal pulls very rapidly succeeding each other, and the direction of the shock was apparently W.S.W. and E.N.E.

ON Monday night, in the House of Commons, in answer to a question from Mr. Mowbray as to "whether the new rose window which was being placed in the transept of Westminster Abbey was entirely different in design to the one which had been there since the beginning of the last century," the First Commissioner of Works replied that he had no authority in the matter, but that having called the attention of the Dean of Westminster to the question, he had been requested to say that the window in question was in a state that made the replacing of the material by fresh stonework absolutely necessary, and that the Dean and Chapter, acting under the advice of their architect, had decided to follow what they had reason to believe was the earlier form of the window, rather than that introduced in the last century. So here is another archaeological sham put up. There seems no end of this kind of foolish work. If the existing window was decayed (a statement which we see no reason to doubt), it was quite right to replace it with the best one that could be designed in accordance with the style of its surroundings; but why go through the farce of pretending that it is a restoration of what was there before, or trying to make it appear so? Even if it could be proved to be so (which is impossible), a replica is of no value, in architecture at all events.

FOR several years the interior of the Cathedral at Vienna has never been entirely free from scaffolding, in consequence of the thorough cleaning-down to which the vaulting throughout was being subjected. In the course of centuries the surfaces of the stone ribs and arches had become thickly incrustated with the smoke of wax candles and incense, not only rendering invisible much that was beautiful in design and carving in those airy regions, but casting a heavy, pall-like reflection of blackness upon the church below. On Easter Sunday all scaffolding was gone, and the interior, having been only cleaned, happily not "restored," stood out with a clearness unknown probably since the building was first completed. The Cathedral, dedicated to the Austrian patron saint, St. Stephen, consists of three naves all of equal height, the dimensions being:—Length, 332 ft.; width, 147 ft.; height, 88 ft.

THANKS to the splendid weather at Paris last Saturday, the 1st of June fête at the Exhibition went off brilliantly, and in the evening an immense crowd filled the Champ de Mars, where the illuminations were even superior in effect to those of the opening day. We must remark, however, on the insufficiency of the iron foot-bridge in front of the Pont d'Alma, which connects the two annexes of the Quai d'Orsay. This, which takes the likeness of a kind of triumphal arch, decorated with escutcheons and flags, at the end of the Avenue Rapp, is a clever innovation in iron construction, but the engineer who contrived it did not sufficiently reflect that there might be at certain times a great crowd of people collected on it. There have been accidents already from too great a crowd on its narrow road, and on the fête day a double cordon of police had to be formed to organise the crowd and prevent too many passing at once. M. Alphand has, we believe, taken the matter in hand, and it is probable that the width of this aerial bridge will be doubled. In the evening the scene was a curious one; the restaurants were



filled to overflowing, and many of the visitors were seen sitting about on the lawns over their dinner. The Tower and the central dome and the Trocadéro at the same time began to light up with thousands of lights. The last-named building, the design of the late M. Davoud, which has been much criticised from an architectural point of view, furnishes however an exceedingly satisfactory vehicle for illumination. At nine the fountains under coloured light began to play, and later on a display of fireworks commenced from the end of the Île des Cygnes, and this multitudinous spectacle went on till midnight. We may say that there are to be five other such displays during the period of the Exhibition, without counting those which will accompany various official celebrations, among others a fête to celebrate the presence of the Shah of Persia.

WE remarked last week, in regard to Constitution Hill, that we expected it would be thrown open to the public; and on Monday night it was announced in Parliament that the Queen had approved of the opening of Constitution Hill for light traffic under rules somewhat similar to those now in force with regard to the road between St. James's Palace and Buckingham Gate. The road will be closed when the Queen is in London. We regret the decision, as one against the real interests of the public, and one which takes away, moreover, all the dignity and meaning of the Constitution Hill arch as a state entry to privileged ground. The whole thing is thus, in the literal Latin sense, "vulgarised." It is far more to the real interest of the London public that some of these quiet London oases should be preserved unspoiled.

BY courtesy of the Office of Works, we have had a closer inspection of the heraldic finials in the now-deserted area of Westminster Hall. These are not worth the terrible denunciations made about them by excited æsthetic members of the House, but it cannot be denied that the effect of the four sitting in a row on the pedestals of the centre stairs is rather absurd, and they certainly seem very much out of keeping with the dignity of the great Hall. This result arises partly from their being rather large in scale for the position and rather small (in another sense) in style. A more massive and monumental, and rather less realistic treatment, would have given them a very different expression. They are too slight and too prominent, as it is, and look too much as if they were very liable to be knocked off. A comparison was made between these and the previously existing "creatures" at the top of the Hall; but these latter are decorously backed against the wall; they do not stand out in the pronounced manner that the new ones do. When the colour of the new stone has toned down they will be less conspicuous in effect. But on the whole we cannot feel much surprised at their being the objects of some mockery. It is not so much that a finish of that kind is out of place there, but that they are poor in style and have a very gingerbread appearance.

THE jury which is to decide the forthcoming preliminary competition for the German National Monument in memory of the late Emperor William has now been named by his grandson, and consists of seven members of the Federal and Imperial Councils and seven artists. Among the former are the Minister of State, Von Bötticher, the Ambassadors of Bavaria and the Hanse Towns, and the President of the Upper House. The artists are the architects Von Leins (Stuttgart) and Blankenstein (Berlin); the sculptors Volz (Carlsruhe), Von Miller (Munich), and Encke (Berlin); the painter Janssen (Dusseldorf), and Dr. Jordan, the Director of the National Gallery at Berlin. The competition will not be an international one, but is to be confined to Germans only, and the result is expected with much interest, especially as the names of the jury and the manner of its composition have given general satisfaction and confidence.

A LARGE portion of the Braid Hills, situated to the south of Edinburgh, has been acquired by the City to be used as a public park. The area acquired consists of 134 acres, and the Corporation have also leased, for a period of ten years, an additional plot of twenty-two acres. The principal object for acquiring the ground was that provision should be made for the formation of a new golf-course in place of that which has so long been in use on Bruntsfield Links, where, owing to the extension of the city and the increased traffic, there is now danger to the inhabitants in the neighbourhood. A connexion between the newly-acquired ground and that of Blackford Hill, an outlying spur of the range, which belongs to the Corporation, has been formed, so as to make them practically one park. These hills are richly clad with gorse, now showing at its best in a mass of golden bloom. They command magnificent views, not only of the city, but of the Forth and of the Lothians and Fife.

THE new West Wing of the Edinburgh Museum of Science and Art has now been opened to the public. It contains on the ground-floor the new library of the Museum, which is 80 ft. by 55 ft. The upper hall has a gallery 10 ft. wide, and in that hall are placed the Indian and Persian collections. The allegorical groups of statuary have been placed over the central entrance, and the building is now essentially complete. The internal arrangements are very simple, consisting of a series of minor halls arranged around three sides of the great central hall, and the lighting is very satisfactory.

THE June number of the *English Illustrated Magazine* contains an interesting article on the story of the Savoy, illustrated by various sketches in the vicinity of the Savoy, by the author of the article, Mr. Dewey Bates. In the *Portfolio* Mr. Loftie's series of articles on Westminster Abbey continues, with Mr. Railton's illustrations, including a fine separate page-plate of a view in the choir ambulatory, executed with remarkable power of effect and precision of detail. The *Scottish Art Review* gives a good reproduction of Mr. Burne-Jones's pretty but sentimental picture, "The Bath of Venus." There are some remarks on "Street Architecture," with two sonnets in praise of Edinburgh scenery, by Professor Blackie. The criticisms on the picture exhibitions are curious reading, displaying a strange perversity of taste with a certain amount of ignorance. In the article on the Academy Exhibition, "The Young Duke" is described as "one of Mr. Orchardson's graceful illustrations of aristocratic life of the time of the Georges"! Why, the whole thing is as French as can be, in costume, personalities, and table ornaments.

THE *Essex County Chronicle* is very indignant because various architects have declined to enter the competition for the new Chelmsford Grammar School, on account of the Governors declining to employ a professional assessor. One of the architects who has signed the undertaking not to compete unless a professional assessor is appointed, wrote that by refusing to appoint one the Governors "were excluding 1,300 architects from the competition." This was an unwise and illogical remark. As the journal referred to observes, "The 1,300 architects have excluded themselves." They have elected not to compete except on certain terms, but they are in no way entitled to demand that their own terms should be accepted. The *Essex Chronicle* is, however, equally in the wrong in its comment. This attitude on the part of the architects, the paper says, "is practically announcing to public and semi-public bodies that, in the opinion of the architects, they are not competent to tell the difference between good plans and bad ones,—between what they want and what they do not want." But unfortunately, that is precisely the fact. Ninety-nine out of a hundred people who have not special knowledge of building are quite incompetent to understand the real meaning

and result, so to speak, of a set of plans and sections; and long experience has shown architects that there is little chance of justice being done and of the best plans being selected in a competition unless there is a professional adviser on the committee to explain the merits and meaning of the drawings. The *Essex County Chronicle* rejoices over the fact that there are a sufficient number of architects willing to compete in this case, without "cramping this astounding condition down the throats of the Governors." A sufficient number: just so; but who are they? Quantity is one thing, quality another; and if the Governors knew the truth they would probably find that they have cut out all the men whose plans were likely to be best worth having.

MANY hard things have been said in regard to the Eiffel Tower by architects, artists, and other such prejudiced persons. But the Eiffel Tower and its constructor can afford to despise all this. The Eiffel Tower has been consecrated by receiving the blessing of M. de Blowitz, who in his Paris letter in the *Times* of Monday last says, "I cannot but bestow the greatest admiration on this gigantic work, after seeing it close at hand. The plan, the execution, the details, the sensations which the tower awakens in those who visit it, will send the name of Eiffel to the extremities of the globe, and hand it down to succeeding generations." That, no doubt, was what it was built for: and that is the kind of success which is apt to call forth the admiration of the de Blowitzes of this generation. The tower is no larger than one half-span of the Forth Bridge, but then the Eiffel Tower merely stands upright, whereas the Forth Bridge is built out horizontally into the air over deep water; the Forth Bridge is a useful work of engineering, the Eiffel Tower only a foolish and costly piece of brag. Yet there are numbers of Englishmen who will go over and hold up hands of wonder before the Eiffel Tower, who do not even know where the Forth Bridge is. But they will admire in company with M. de Blowitz, and that is in itself a distinction—of a kind.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—VI.

1911. "New Technical School, Stockport": Mr. George Sedger. A good water-colour perspective of a red brick building, to which a certain definite character is given by the grouping and spacing of the windows, which seem to indicate the distinction between the departments of the school. A plan would have enabled us to understand how far this is really in correspondence with the internal arrangement; as it is, we can only guess at this.

1914. "Buller's Wood, Chislehurst": Mr. Ernest Newton. This is described as "alterations," but there is no precise indication how much is new and how much old. The plan shows an admirable variety in the planning of the entertaining-rooms: the drawing-room in particular should be a charming room, with its two fire-places and picturesque arrangement of bays and alcoves. The drawing is a well-executed pen perspective of a low house with a long line of roof ridge and very plain square chimneys, the only picturesque incidents being the projecting bays of various plan. These are probably additions; the eaves cornice of the main roof is carried round them, but the bays are left flat on the top; they seem rather to want something over them. The whole has the merit of simplicity and domestic repose of effect.

1916. "New Hospital for Women, Euston-road": Mr. J. M. Brydon. Picturesquely treated in a simple and (as far as one can guess without a plan) suitable manner. Some use is made of the arches carrying open corridors of communication between one block and another, to produce effect; and the treatment of the boundary-wall, with inverted arches scooped out between the piers, and the space filled in with iron railing, is effective, and gives a play of line which relieves the otherwise utilitarian character of the building.

1917. "Hôtel Métropole, Brighton": Mr. A. Waterhouse, R.A. Very like a hotel; may we



be permitted to say, rather too like one, at least for the Architectural Room at the Royal Academy. By what freak was this put in the centre place, instead of Liverpool University College, which is a really interesting design? That it is a larger drawing seems to be the only comprehensible reason. It is a pity Mr. Waterhouse did not take care that the University buildings should be his leading drawing; it would have made a better centre-piece than this.

1918. "Chapel of St. John, Liverpool Cathedral; interior and exterior." Mr. Jas. Brooks. Two of the author's remarkable set of Liverpool Cathedral drawings, of which the exterior was illustrated in our pages on March 6, 1886. It is a corner of the proposed cathedral seen at close quarters, and consisting mainly of masses of wall and buttress piled up in a way that the modern architect is seldom allowed to build; hence the half-melancholy satisfaction of doing it on paper.

1919. "Dining-room decoration." Mr. T. W. Hay. A very sumptuous scheme, shown in a good water-colour perspective of the interior, but hung too high for the details to be well seen. It is apparently Greek in detail, with marble pilasters in the lower portion, and what may be either a fresco or mosaic frieze of decorative figures and emblems on a light ground. The ceiling is coffered, with panels decorated in blue and gold. The general effect is rich and sumptuous, but the work (which we imagine is not carried out) would be very costly in proportion to the effect produced. This being a drawing with a high point of sight, is of course stuck up at the top of the hanging line, far above the eye, so as to distort it as much as possible, according to what appears to be an almost deliberate practice in hanging the architectural drawings. One would have supposed architectural R.A.'s might at least recognise the fact that a drawing with a high sight-line requires to be hung low.

1920. "A Drawing-room in the style of the Consulate." Mr. Walter Hensman. A brilliant water-colour drawing of an interior of a large *salon*, in which the author has contrived to produce a fairly harmonious though somewhat gaudy effect in spite of the employment of much strong colour. The walls are divided out by pilasters decorated with Neo-Greek ornament in red; between them the wall has what is probably meant as a gold ground with a broken grey-blue border, and festoons and garlands disporting over the wall. A deep frieze of rich gold scrollwork on a dark ground binds the whole together. The Turkey carpet indicated on the floor is not in keeping with the whole scheme in regard to colour; but that is partly a question of texture of material; that which seems harsh on a smooth surface may be quite softened down on a surface of rough and soft texture; and thus a Turkey carpet will go with almost anything.

1921. "New Church, Barmouth, North Wales; competition design." Mr. T. E. Pryce. We have previously referred to this, which is a kind of design more likely perhaps to be admired than accepted in a competition; the average competition committee would probably regard it as a building in which much stone and labour was wasted in blind walling. The hilly site furnishes an apparent excuse for this, and we have a church with richly-traceried windows in the upper portion of a mass of plain wall, with a crypt or school below, and a flying-staircase arched over the entrance to the lower story for access to the church proper. A lofty double-gabled transept stands out boldly from the nave up to the road line, with buttresses running the whole height of the front, and two large perpendicular windows in the upper portion. The whole effect is most picturesque, and one quite regrets it has not been built.

1923. "Cottages, village shops, and Connalescent Home, Leigh, Kent." Messrs. Ernest George & Peto. Charming examples of village architecture, with less appearance at trying to be picturesque than is sometimes evident in modern cottage architecture of this class.

1924. "Design for new Market Hall, Rotherham." Messrs. Mitchell & Butler. A very artistic drawing in brown ink, tinted with the brush, showing a block of building with shops and an arched entrance in the ground story, and a frieze decorated with garlands, and with small windows at intervals. The main block of buildings, running to the back at right angles with this, is evidently glass-roofed and louvred, but the glass roof is kept out of the view. Of the practical suitability

of the design there is nothing to give information; like No. 1887, it is a picture, and nothing more. This is a drawing with a very low sight line, below the margin of the visible picture, indeed; it is therefore (of course) carefully placed at the lower limit of the hanging line, below the eye, and where it can be seen to the greatest disadvantage.

1926. "Proposed Church of the Good Shepherd, Hampstead; interior." Mr. Jas. Brooks. This is a vaulted interior in which the vaulting-ribs spring, without the intervention of capitals, from very thin cylindrical piers, with an abutting vault over the aisles, which are narrow in comparison with the centre, and possibly intended as aisles of passage only. If the piers are really intended to be as thin in proportion as shown here, the construction will be a nice piece of equivoque, and the piers will require careful building. In the drawing the effect is very good.

1928. "Design for Church, Maida Hill; exterior." Mr. John Belcher. This is a large and powerfully-executed water-colour of a design for a church which is hardly, we imagine, likely to be allowed to startle the "respectable middle-class neighbourhood" of Maida Hill, but which is interesting enough in itself, and certainly one of the most original things in the collection. In a red-brick gabled end, rather suggesting in its general outline and proportions a large barn, is an immense deep-set tracery window under a four-centred arch, filling up the whole space between the flanking turrets of the facade; the window has nine lights, but between the five centre and the two outer ones at each side is a large stone buttress flying out on to the porch walls below, thus giving a solid pier in place of a mere mullion at two points in the window. The side towers or wings are marked by some white and red banded work, and over this is a stone stage with mullioned windows, which finishes square, at the foot of the main gable. Below the large window is a stone porch with marble columns, supporting a frieze carved with figures (roughly indicated) with no architrave; at each extremity of the porch is an octagonal bay, apparently containing a staircase, solid beneath, with a window-stage at the top and a low hipped roof. In the rear on the north flank of the church, a plain octagonal tower in brick rises, but above the cornice suddenly breaks into a rich congeries of stone-work, buttresses and arches heaped together in a general spire-like outline, and as if built in as an afterthought. It cannot be said the whole is beautiful; it is far too *bizarre*, the detail wants assimilating, and the whole thing requires refining; but it has the rough elements of an exceedingly picturesque piece of architecture; a sort of thing which one would feel irresistibly impelled to stop and get into one's sketch-book, if one met it abroad. But if built in a London suburb, many of the very people who would sketch it if they met it abroad would only say—"What a queer building!" We are so respectable in England—even in our architecture.

1930. "Staircase decoration, 89, Queen's-gate, Kensington." Mr. J. H. Eastwood. A very pleasant and harmonious piece of decoration consisting of a raking dado of gold foliage on a dull ground, above which is a series of upright trees, of conventional foliage, light blue predominating, on a nearly white ground. A narrow frieze of foliage of a different design on gold ground completes the whole. The only question suggested is whether the "trees" of the middle portion are not somewhat out of scale with the rest: looking at them at first, and before we noticed the section line of the steps, they certainly conveyed the idea of being work on a smaller scale than is actually the case.

1931. "Design for a Clock Tower at Liverpool." Sir A. W. Blomfield, A.R.A. This is a classic clock-tower of very elegant detail, with an octagonal lantern and spirelet on the top of the square tower. It seems to fall in effect as a tower by being divided up into too many nearly equal stages. If the portion of the height between the rusticated basement and the clock-stage had been treated in one height, it would have had much bolder and more tower-like effect, and the clock-stage, which is the *raison d'être* of a clock-tower, would have been better emphasised.

1934. "The Weigh-house Chapel, Mayfair." Mr. A. Waterhouse, A.R.A. We gave some particulars the other day about the former sites of the King's Weigh-house Chapel building

and the history of former buildings bearing that title. (See "Notes," p. 388, *ante*.) A plan would have made the building more intelligible: the chapel portion appears to be an oval on plan, with a tiled roof following the line of the walls, but gathered up at the top into a ridge parallel with the longer axis of the oval. This oval structure stands in the midst of a square formed by one-story buildings with a balustrade on the top, the use of which and the manner in which they work into the plan of the whole cannot be ascertained from the perspective view. There is a tower of very early French look, with triangular-shafted turrets placed obliquely and standing free at the angles of the lantern stage. The suitability of this Galloised architecture, for a building of this kind on a London site, seems rather questionable.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The eleventh ordinary (business) meeting of this Institute, for Session 1888-89, was held on Monday last at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

#### Additions to the Library.

Mr. W. H. White (Sec.) announced the receipt of a large number of donations to the Library, including the bequest of books made by the late Mr. C. R. Pink, and several gifts of money. Votes of thanks were passed to the several donors.

Mr. Octavius Hansard said that Mr. Pink's bequest was unique in character, and deserved some recognition from the members. It gave the Institute the privilege of taking every book from Mr. Pink's library of which they had not some edition or other, while the remainder were to go to the Architectural Association. He would, therefore, like to propose a special vote of thanks to the executors for the manner in which they had carried out Mr. Pink's bequest (applause).

Mr. Wyatt Papworth seconded the motion, adding that the bequest comprised nearly 200 different works and editions.

The resolution was agreed to unanimously.

#### Election of Council for 1889-90.

The President then read the report of the scrutineers as to the result of the voting for the Council for 1889-90. The report showed that 521 lists had been sent in, of which twenty-six were rejected as informal, leaving a total of 495 valid lists. The following was the result of the voting:—

*President.*—Mr. Alfred Waterhouse, R.A.  
*Vice - Presidents.*—Professor Aitchison, A.R.A.; Mr. John Macvicar Anderson; Mr. Arthur Cates; and Mr. Henry Curry.

*Honorary Secretary.*—Mr. Aston Webb.  
*Members of Council.*—Messrs. John Belcher, jun.; Thomas Blashill; James Brooks; Thomas Edward Colclough; Campbell Douglas (Glasgow); Robert William Edis, F.S.A.; William Emerson; William Milner Fawcett, M.A., F.S.A. (Cambridge); Charles Fowler; James Barlow Fraser (Leeds); Alexander Graham, F.S.A.; Edward Augustus Gruning; Octavius Hansard; John Holden (Manchester); Wyatt Papworth; Edward Cockworthy Robins, F.S.A.; John Slater, B.A. Lond.; and Richard Phéné Spiers, F.S.A.  
*Associate-Members of Council.*—Messrs. George Richards Julian and Thomas Miller Rickman, F.S.A.

*Presidents of Allied Societies.*—Mr. Henry Crisp, Bristol Society of Architects; Mr. Thomas James Flockton, Sheffield Society of Architects and Surveyors; Mr. Edward Joseph Hansom, Northern Architectural Association (Newcastle); Mr. George Thomas Hine, Nottingham Architectural Society; Mr. Edmund Kirby, Liverpool Architectural Society; Mr. William Alfred Royle, Manchester Society of Architects; and Mr. James Tait, Leicester and Leicestershire Society of Architects.

*Representative of the Architectural Association (London).*—Mr. Herbert Duncan Appleton, Fellow, President A.A.

The new Council will thus consist in all of thirty-four members.

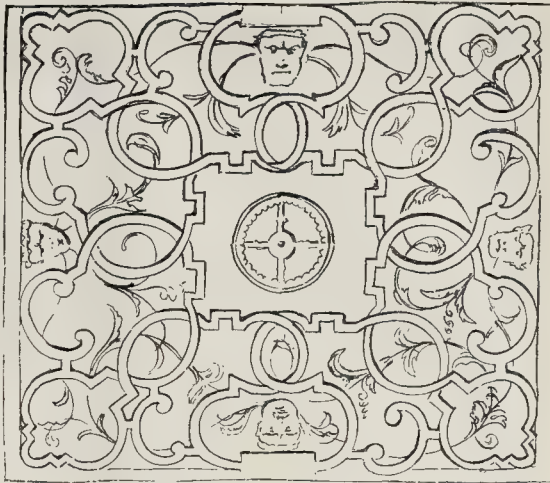
#### Election of Standing Committees.

The President then announced the result of the election of the Standing Committees for 1889-90. Separate committees were elected for Art, Literature, Practice, and Science. Each

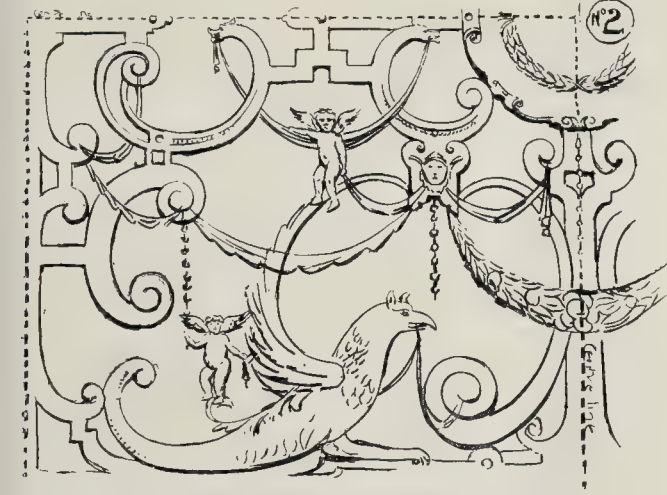




PORTION OF CEILING, NEWNHAM, DESIGNED IN SMALL CURVES.



CEILING DESIGNED IN LARGER CURVES.



PART OF COVED CEILING, SLYFIELD HALL.

Diagrams of Ceilings in Illustration of Mr. Champneys's Paper.

committee consists of ten Fellows and six Associates.

Votes of thanks were passed to the scrutineers for their arduous labours.

#### Election of Auditors.

Mr. H. S. Legg, Fellow, and Mr. Bernard J. Dicksee, Associate, were appointed auditors for the year 1888-90.

#### The Retiring Honorary Secretary.

Mr. John Belcher proposed a cordial vote of thanks to Mr. J. Macvicar Anderson, the retiring Hon. Sec., for the agreeable and able manner in which he had conducted the duties of his office (applause).

Mr. Henry Currey, in seconding the resolution, spoke of the attention and kindness Mr. Anderson had shown during his term of office, and the very high professional tone of honour he had given to all the proceedings of the Institute (applause).

Professor Aitchison supported the motion. The resolution was put, and was most heartily received.

Mr. J. Macvicar Anderson, who was received with applause, said that he would be somewhat of a callous and perhaps cold-blooded indi-

vidual who could listen to such expressions respecting himself as those of Mr. Belcher and Mr. Currey, and the unanimous manner in which those expressions had been received, without some degree of feeling. If, therefore, the words he had to say were few, and not so well expressed as they ought to be on such an occasion, he begged them to believe that it was because, appreciating so highly their kindness, he was unable to express, as he ought, his thankfulness for it. It was now nearly nine years since the members were kind enough to elect him to the position of Honorary Secretary of the Royal Institute of British Architects. At that time he esteemed it a very high honour, and at no time during the period in which he had held the appointment had he ceased to esteem it as such,—for this reason, if for no other; that in carrying out the duties of the office he had been actuated by one single motive only—from no desire to promote personal ambition, but from a pure and sincere wish to promote the honour of the profession of architecture, and of the Royal Institute of British Architects, which was the representative of that profession (applause). During those nine years it had been his happiness and good fortune to be associated with no fewer than six Presidents of the Institute,—

the late Mr. Whichcord, the late Mr. Street, the late Sir Horace Jones, Mr. Christian, the late Mr. Anson, and Mr. Waterhouse. When he accepted office, he took occasion to refer to his predecessors in the work,—such men as Donaldson, Hayter Lewis, Cockerell, and Wyatt,—and expressed the diffidence with which he ventured the attempt to follow in their footsteps. In vacating the office, he felt that, from the manner in which the motion had been received, he resigned the position as untarnished as he had received it at the hands of his predecessor (applause). He had only one word more to add, and that was to thank the President and his colleagues on the Council,—and, indeed, he might say every member of the Institute,—for the forbearance they had invariably extended towards him in the execution of his office, and for their extreme kindness and confidence on all occasions. He would further say that if there was one consideration which rendered it pleasant for him to vacate the office, it was that he would be succeeded by a gentleman who was sure to maintain the dignity and the honourable and gentlemanly spirit that ought to pervade an Honorary Secretary of the Institute (loud applause).

#### The Retiring Treasurer.

The President remarked that the Honorary Treasurer,—Sir Walter Farquhar,—who was now going out of office, had been the Treasurer of the Institute for upwards of fifty-three years, and by his courtesy he had repeatedly aided the Institute in days gone by when they were in temporary difficulties. They were not likely to get into such a position again, but it, no doubt, would be consonant with the feelings of the members that their best thanks should be given to Sir Walter Farquhar (applause).

#### Election of New Members.

*Fellows.*—The meeting then balloted for the following Fellows, who were all declared duly elected:—Messrs. George Inskip (Associate), London; Charles Herbert Shoppee (Associate), London; Richard Chaytor Millar (Associate), Dublin; Arthur Henry Reid (Associate), Johannesburg; Transvaal; Munchierie Cowasjee Murzban, Bombay; John Cotton, Birmingham; Thomas Drew, R.H.A., Dublin; Alfred Culshaw (Associate), Liverpool; George John Skipper, Norwich; Thomas Cook, Liverpool; Henry Hartley, Liverpool; Arthur Benjamin Plummer (Associate), Newcastle-on-Tyne; William Jackson, Leicester; William Henry Harrison, London; Arthur Sutton Gover (Associate), London; Andrew Thomas Taylor (Associate), Montreal, Canada; Richard Creese Harrison (Associate), 103, Cannon-street; and John Stansfield Brun, Bradford-on-Avon.

*Associates.*—The following forty-four candidates for the Associateship, who had all passed the necessary qualifying examination, were, in accordance with By-law 9, elected *en bloc* by show of hands, viz., Messrs. Charles Oury King,



London; Walter Albert Williams, Bromley, Kent; Edmund Walter Wimperis, London; Richard Henry Weymouth, Acton; Frederick William Dorman, Northampton; Robert Henry, Leeds; Sidney Macfield Fairlie, Manchester; Francis Baugh Andrews, Birmingham; William Henry Stucké, Cheltenham; Robert Edmund Crossland, London; James Barritt Broadbent, Withington, near Manchester; Benjamin Woolard, London; Henry Langton Goddard, B.A., Leicester; Percy Christian Gibbs, London; Allan Ovenden Collard, London; Banister Flight Fletcher, London; Egbert Augustine Crooke, Crewe; Arthur Spottiswood Jones, Croydon; Henry Francis Kerr, Edinburgh; Frank Minshall Elgood, London; Herbert Read, London; David Bird, Sale, Cheshire; Edward Guy, Dawber, Bourton-on-the-Hill, Moreton-in-Marsh; Laurence Youngs, London; Reginald Alwyn Crowley, Alton, Hants; Arthur Needham Wilson, London; Robert Falconer MacDonald, London; Francis Thomas Verity, London; Frederick Henry Talloch, London; Edgar Augustine Hawkins, London; George Orrell, Chorley, Lancashire; Edgar Thomas Ainger Wigram, B.A., London; Langton Dennis, London; Charles Herbert Cooper, London; Francis Fitzadell Perse, Loughrea, Ireland; Henry Ross, Accrington; Edward William Hudson, London; John Reginald Best, London; Herbert John Philip Kimpton, London; Herbert George Ibberson, London; Thomas Dinham Atkinson, Cambridge; Walter John Tapper, London; Thomas Bradford Ellison, London; and John Clark Stransom, London.

*Honorary Fellows.*—The following gentlemen, hitherto Honorary Members, a class which under the New Charter has ceased to exist, were elected as Honorary Fellows, viz., Dr. Edward Augustus Freeman, Somerleaze, near Wells, Somersetshire; and the Rt. Hon. Sir Henry Austen Layard, G.C.B., D.C.L. (Royal Gold Medalist), London.

*The History and Uses of Plaster-work, especially as Relating to Ornamental Ceilings.*

Mr. Basil Champneys then read a paper on this subject. At the outset, he disclaimed any attempt to deal exhaustively with the subject, treating it mainly from a practical point of view, and dwelling upon that application of the art likely to be of most importance in the immediate future. As an introduction, he remarked upon the great and increased importance of plaster-work. It was not long since that a certain school of architecture had gone far towards depreciating the plasterer's work as a modern superfluity. It had been formulated that Gothic architecture, being a style of true construction, had in all cases to expose its own anatomy. Plaster on walls, ceilings, or roofs was, according to that misreading of the principles of Gothic architecture, to be rigidly expunged as an anomaly. If that misapprehension had affected original works alone, it would have been comparatively harmless; but it was in restoration that the more calamitous effects were to be detected. Stone walls in restored churches were stripped of their plaster, the joints of the masonry being made conspicuous by pointing, sometimes in mortar of a vivid black; and timber roofs of the tie-beam and king-post type were similarly stripped of their ceilings, and made into open-timbered roofs, reduced by the falsification to mere absurdity. If such action cast plaster into disrepute as a Sybaritic superfluity, not less injurious had been its superabundant and meretricious use in that style, or no style, which until lately had produced the majority of modern domestic buildings. The author, proceeding to give an outline of the origin and history of the art, stated that its origin was lost in antiquity, but plaster-work was known to have been largely used in the temples of ancient Greece, and probably still more largely in domestic buildings. Of Roman plaster-work enough was found to show how extensively it was employed, and to what perfection its decorative uses had attained. All the work unearthed in Rome, Pompeii, and Magna Grecia was exclusively hand-modelled, but casting in plaster was not unknown. The art lapsed with the Roman Empire, but its influence survived in the East, whither it had travelled, and, through the Renaissance, Roman examples were indirectly the origin of all post-Gothic European work. Its revival as an architectural accessory occurred at the close of the fifteenth century, but the earlier Renaissance sculptors had employed plaster for bas-reliefs of religious

subjects in portable forms. Having referred in detail to the history of *sgraffito* art, Mr. Champneys described the re-discovery of plaster-modelling in the exhumation of the Baths of Titus, and the manner in which it had been introduced into Northern Europe during the sixteenth century. The further development in England was traced only so far as was necessary to the more practical discussion of ornamental ceilings. Plaster was used in England for purposes of adornment before the Renaissance. He had been unable to find any account of the method employed, but gathered, from examination of examples in late Medieval churches, that a method of simplifying intricate workmanship was adopted. The woodwork in which the large features were wrought by hand was covered by an incrustation of some sort of cement or plaster, which seemed to have been stamped when soft by a die, and that method appeared to have been used only where a considerable repetition of detail was admissible. He had very little doubt that the material was used for many other purposes besides screens and stalls, and could see no objection to its use in Gothic churches, provided it were so employed as neither to take the place of nor imitate any material of greater dignity. It was to ceilings that the further history of the art would be of principal interest, both practically and historically. The erection of Nonsuch House in the time of Henry VIII. gave, no doubt, a special impetus to the art, and the more elaborate forms of plaster ornamentation were posterior to it. He thought, however, that a simpler form had been previously in use, and traces of that form survived to a later date. One example of the immediate influence of Nonsuch House was the Fish-room of Audley End. In that ceiling large and heavy pendants fell some feet from the ceiling, dividing it into thirty-two compartments. The elaborate form might have been an imitation of stone vaulting and the simpler form of wooden ceilings. Intricate geometrical forms had then been introduced, succeeded by curves of various kinds, and in the seventeenth century strap-work began to be the prevalent ornament. There was, however, no limit to the variety which plaster ceilings of that date exhibited, and, with the complete liberation of line, figures of animals and other similar adornments began to be introduced, as, for example, at Slyfield Manor House, in Surrey. Of ceilings of later date not so much need be said, as all were more or less familiar with them, and their history showed a gradual decadence, the boldness and freedom giving way to an uninteresting refinement, until in the Adam times a delicate prettiness was all that survived. Dealing with the principles which should govern the design of a ceiling, Mr. Champneys considered the primary necessity was that it should give repose to the eye. The methods of decorating ceilings might be divided into three,—by colour only, by simple relief, and by colour and relief combined. For practical purposes, however, patterns from which figure-work would be in the main excluded only would be required, and, whether it be flat or in relief, moderation and repose should be observed. If colour only were used, it should be harmonious, and with but little difference between the pattern and the groundwork. If relief, the relief should be low. The pattern ought not to lead in any one direction, and if it did, it must be either from the cornice towards the centre, or *vice versa*. Rectangular patterns militated against repose, and were less fitted for ceilings than more flowing ones. Having stated in detail the reasons for the above and other principles to be observed in designing ceilings, the author proceeded to treat of the methods of workmanship, of which the following were the three principal modes in vogue at the present time. The first was to lay a flat surface of plaster and build the ornament upon it; the second was to cast the entire ceiling in sections from a clay model; the third was to work the ornament in the plaster while it was soft and malleable. The first had, he believed, no authority in antiquity, nor was it satisfactory; and the choice was between the two latter, which were described fully by the author, and admitted of precisely the same good results, although the last was attended by far greater difficulties, which all led to a great increase of cost. It was generally believed to be the ancient method; he had, however, found evidence that it was not invariably so, and thought the usual method was a combination of the two processes; the leading ornament being cast and placed in position on the soft plaster on which

the subordinate features were modelled. In conclusion, Mr. Champneys mentioned that those who sought for motives for similar types of design to those he had advocated would find abundant suggestions in old book-plates of the sixteenth and seventeenth centuries.\*

Professor Aitchison, A.R.A., in proposing a vote of thanks to Mr. Champneys for his extremely interesting and valuable paper, said it was rather treading on the heels of the sculptor, as, in his opinion, the subject did not belong to architects at all, though it was none the less interesting. The subject was so large, and had been treated so fully by Mr. Champneys, that it would be impossible, at that late hour of the evening, to enter into any consideration whatever of the various statements and theories which had been put before them. At the same time, he would like to say a word or two. Although he generally preferred to have flat plaster-work on the ceiling, this liking could not be converted into an axiom, for high relief was quite as effective in its proper place. The best treatment depended on the height and decoration of the room, and the depth of the coffers. Much of the ornament done in the time of Inigo Jones, and even so late as that of Sir William Chambers, was fruit and flowers in high relief, evidently moulded by hand, because where those were taken down the marks of the plasterer's fingers on the leaves and of his thumb on the fruit could be seen. Perhaps the most beautiful specimen of plaster-work he had ever seen was in a vaulted chamber in the Villa of Hadrian near Rome. On his last visit he was unable to see it, but when he inspected it some fourteen years ago, it appeared to him entirely moulded by hand, and it had all the charm of work done by an able artist, and might be looked at in the light of a sketch. The plaster work of the Villa Madama was partly done by Giulio Romano and partly by Giovanni da Udine, and was a copy of one of the chambers then in existence at Hadrian's Villa. A most exquisitely modelled copy of this was being executed at Rome by Signor Mariani for the South Kensington Museum. The art was not entirely lost, for some fifteen or twenty years ago a clerk of works told him that he had learned the art from an Irish plasterer, and was prepared to do some work which he (the speaker) wanted, though not at the same price as cast work. He believed the secret was an open one, and that treacle, sugar, milk, and size were mixed with the plaster to keep it soft for modelling, and was called *gesso duro* in Italy. The charm of the stamped work was very great, because as the plaster did not dry uniformly, and as the man who applied the stamp did not make a uniform impression, it had all that charm of variety which cast-plaster could never possess. The workman could never press the stamp exactly to the same depth, and even if he used the same force there would be a difference in the result, as some of the plaster was harder than the rest. It would be impossible to enter into all the points that had been raised, and particularly into the question of *sgraffito*, which was hardly, in the ordinary sense, plaster-work. *Sgraffito* work could be done at no very great cost, the great thing being to obtain a design from an able artist, because almost any skilful decorator could execute it. The plaster-work at Hadrian's Villa was similar in treatment to the best decoration on the silversmiths' work of the Treasure of Hildesheim,—supposed to have belonged to Varus, and was quite equal to the best Renaissance work. The members were deeply grateful to Mr. Champneys for the admirable paper he had given. In that paper he deplored that the genius of the nineteenth century was mainly devoted to forgery. Well he (the speaker) had been travelling about England, and certainly found that in the shape of stained-glass it had been carried to such an extent that it might deceive anybody; it was difficult to say that the work did not belong to the fifteenth or sixteenth century, instead of to the nineteenth. In the ruined part at Hardwicke Hall was an admirable example of the methods used at the time. The parts in high relief were blocked out in coarse plaster, and finished with fine; but whether this last coat was cast or moulded by hand he could not say.

Mr. John Slater, B.A., seconded the resolution, adding that the paper had opened up a

\* We give reproductions of three of the diagrams shown by Mr. Champneys; one a bit from an old ceiling at Slyfield Hall; the other two are intended to illustrate the desirability of large and bold curves in design of this class, rather than smaller local curves.



very wide and attractive subject, which it was much too late, at that hour, to descant upon. He would only like to say that Mr. Champneys had not mentioned one beautiful motif of sixteenth-century plaster-work,—the introducing into ceilings of the badge or emblem of the family for whom the work was done. As one instance he might mention the mulberry, which was extensively used at Loseley as the badge of the More family. It was curious to see how, in some interesting examples, people had been anxious to make the plaster appear as woodwork, and in one old hall in Essex,—Hornham Hall,—where some years ago he had some alterations to make, he found that what were apparently oak beams in the elaborate ceiling of a bedroom were plaster, which had been grained and varnished to resemble oak.

The vote of thanks was then put and carried by acclamation.

Mr. Champneys, in reply, thanked the members for the attention they had given to his paper. The subject was one about which he might have gone on almost *ad infinitum*, and he had only intended to touch a few of the most important points, which he was glad to find had interested them so much.

The President then announced that on Monday, the 17th instant, the Royal Gold Medal would be presented to Sir Charles Newton, K.C.B., and a paper would be read by Professor Baldwin Brown, Honorary Associate, on "Recent Advances in the Study of Architectural History."

The proceedings then terminated.

#### THE ARCHITECTURAL ASSOCIATION: VACATION VISIT TO ETON COLLEGE.

THE first vacation visit this season was made on Saturday last, June 1, to Eton College. About thirty members assembled at Waterloo Station, and proceeded by the two o'clock train to Windsor. Here they were joined by a few others, who had travelled by earlier trains.

The party at once proceeded to the College, where they were received by Mr. H. E. Luxmoore, M.A., one of the College masters, who, assisted by one of his colleagues, undertook to show the members over the old buildings.

Brewhouse-yard was the first part visited, whence a good view is obtained of the east end of the Chapel, and attention was directed to the curiously distorted form of the outer arch of the window. It is supposed that it was originally intended to have constructed a window of a more pointed form, for which the stones were prepared; owing, however, to the troubles at the close of the reign of Henry VI., this was not completed until a later time, when the design was modified, and a flatter arch adopted. The funds being inadequate, the old stones were used, with the result that the inner and outer curves do not agree.

Turning to the north side of the Courtyard, the exterior of the Hall was noticed. This is probably the oldest existing portion of the buildings. There are evident indications that it was originally intended to have formed a much loftier building than at present exists. The work of the founder, Henry VI., extends to the height of the masonry. The building was left untouched during the interval in which the Wars of the Roses took place, after which Edward IV. caused the walls to be carried a few feet higher and completed in brickwork. The existing brickwork probably belongs to the eighteenth century, but merely replaced the older work.

It should be remembered that Edward IV. endeavoured to deprive Eton of the endowments conferred on it by his Lancastrian predecessor, and actually obtained a Papal Bull sanctioning the union of Eton with Windsor. He also took from the College much of its valuable property, such as plate, tapestry, &c. These were, however, ultimately restored, and Edward lent some assistance to the completion of the buildings.

Leaving the Brewhouse-yard, and passing through some of the older parts of the building devoted to larders the kitchen was reached. It is a fine example of this class of building, octagonal on plan and with lofty open roof, and lantern-light above. The kitchen was rebuilt in 1508. The cook is very proud of the mechanical "Jack" for turning the spit. It is dated 1535. The work in this kitchen is confined to providing for the seventy scholars on the Royal Foundation.

The interior of the Hall was next visited. The

"screens" are at the east end, with approaches from the cloisters, the "dais" at the west end, with communication with the Provost's apartments. The fireplaces, three in number, are original, but were not discovered until a few years ago, when the panelling was removed in making some alterations. They had not been used, and the chimneys never completed. The position of one, viz., at the back of the "dais," is somewhat unusual.

In the library the visitors inspected the fine collection of ancient Charters, Papal Bulls, and other documents which belong to the College. Among them, one generally known as the will of King Henry VI., although strictly speaking it is not a "testament," but simply what its royal author calls "My wille and myne entent," as to the arrangement and completion of King's College Cambridge and Eton College. In leaving the Library the members were conducted through the Upper Cloister, from which access to the private rooms of the Fellows is gained, the servants' entrances and inferior rooms being on a level with the open cloister below. Many of the doorways retain their original oak doors, studded with nails, and in some cases the original iron handles remain. Two large rooms in the Provost's lodgings were next visited, where are some fine fragments of old glass; also a large painting representing a "birds-eye" view of Venice, presented by Sir Henry Wotton, who became Provost after his return from Venice, where he was sent as ambassador by James I. It was while Provost of Eton that Sir Henry published his "Elements of Architecture" from materials collected while in Italy.

Returning through the Lower Cloister, and passing under the great gateway, the main quadrangle was reached.

The bronze statue of Henry VI., was erected by Provost Godolphin in 1719.

The Chapel was next visited, attention being directed to the fine original work in the room now used by the chorists. On passing into the Chapel itself it was explained that what now exists is only the choir of a large church which it was originally intended to build in the place of the earlier parish church which was pulled down. From documents now in the library it appears that the projected church would have been nearly 300 ft. long. The question as to whether it was originally intended that the chapel should have a stone vaulted roof was discussed. The large exterior buttresses and the stone vaulting-shafts seem to indicate such an intention, but some writers explain that the chapel is raised to prevent inconvenience from floods, and that the buttresses are required to counteract the outward thrust of the earth enclosed below the floor level. While mentioning the chapel buttresses it will be remembered that the pattern of the "Eton" five-court is taken from the space between these buttresses, where the game was originally played. The space above the stalls was at one time decorated with fresco painting, of which all but some very small portions have been unfortunately destroyed.

The Upper and Lower Schools were afterwards visited, and the garden front of the College inspected from the Fellows' garden.

The party then took leave of their guides, and proceeded to visit the new buildings now in course of construction, from designs by Sir Arthur Blomfield, A.R.A. These are arranged on three sides of a quadrangle, two sides being occupied by class-rooms, and the third by a small chapel.

On the ground-floor level, the rooms are approached from an open cloister. The principal room on this level is the Science Lecture Theatre, adjoining which is a chemical laboratory, in which arrangements are made for delicate experiments, where freedom from vibration is necessary, by two tiers of brick carried 8 ft. below the floor level; these are to be surmounted with granite blocks. There are some smaller class-rooms on this level. On the first floor are the Museum and Curator's room and the Art Class-room, the roof of which is to be decorated by the students. The chapel is hardly sufficiently completed to judge of its effect.

The school buildings are executed in red brick with stone dressings, while the chapel will be entirely faced with stone externally.

**Monument to Herr Krupp.**—A monument to Herr Krupp is to be erected at Essen, at a cost of 5,000*l*. A prize of 100*l*. is offered for the best design.

#### THE INSTITUTION OF CIVIL ENGINEERS:

##### ANNUAL GENERAL MEETING.

THE annual general meeting of this Institution, to consider the Report of the Council and the annual statement of the accounts, and to elect the Council and officers for the ensuing year, was held on Tuesday, the 28th ult., Sir George B. Bruce, the President, being in the Chair.

The Report stated that the Institution included within it civil engineers of every denomination; but at the same time the Council made a rigid inquiry into the qualifications of all candidates seeking membership, while no person was admitted a Student unless he could produce evidence of a competent knowledge of certain elementary subjects of general education.

Considerable attention had been devoted by the Council to the composition of its own body, it having been thought that a more rapid change would be beneficial to the interests of the Institution; but the Council had been unable to take any decided steps in the matter. On the other hand, it was considered advisable that the Presidency should be held by the same person for two successive years, instead of one year, as had generally been the case recently.

The number of members of all classes on the Roll of the Institution on March 31 was 4,739, being an increase of 4 per cent. in the twelve months. The numbers were thus distributed:—Honorary Members, 19; Members, 1,657; Associate Members, 2,613; Associates, 450. At the same date there were 989 Students on the register.

There had been twenty-five Ordinary Meetings, but only fourteen Papers had been read and discussed, for some of which the Council had made the following awards:—A Telford Medal and Telford Premium to Mr. G. Kapp; Watt Medals and Telford Premiums to Mr. W. H. Greenwood and Dr. C. E. Emery; a George Stephenson Medal and a Telford Premium to Mr. E. Worthington; and Telford Premiums to Messrs. J. A. F. Aspinall and J. O. Arnold; and for Papers to be printed in the Proceedings without being discussed:—A Watt Medal and a Telford Premium to Mr. R. Runseberg; and Telford Premiums to Messrs. B. Donkin, Jun., Prof. V. A. D. Dery, R. H. Smith, L. E. Vernon-Harcourt, G. Lopes, and N. Kennedy.

Twelve Supplemental Meetings for Students had been held, which had been well attended, and thirteen Papers had been read and discussed. A Miller Scholarship had been assigned to Messrs. H. B. Ransom, W. W. F. Pullen, J. D. Twinberrow, S. Joyce, R. J. Durely, J. King-Salter, C. H. Gale, and V. W. Delves-Broughton.

The late Mr. T. R. Crampton had bequeathed 500*l*. in trust to the Institution, the interest to be devoted annually to the purchase of a medal or books, to be called the "Crampton Prize" for the best Paper on "The Construction, Ventilation, and Workings of Tunnels of considerable Length," or, failing such a paper, for a communication on any other subject that the Council might select.

The gross receipts for the year had amounted to 21,763*l*. 18*s*. 4*d*., including income, 17,400*l*. 18*s*. 3*d*.; capital, 3,840*l*. 18*s*.; and trust funds, 522*l*. 7*s*. 1*d*. The total expenditure had been 18,226*l*. 6*s*. 4*d*., including income, 13,972*l*. 8*s*. 9*d*.; capital investment, 3,901*l*. 9*s*. 3*d*.; and trust funds, 852*l*. 8*s*. 4*d*. The difference between the receipts and payments was accounted for by the larger balance at the bankers' at the close of the last financial year. The total investments amounted to 98,042*l*. 13*s*. 10*d*.

The promoters of the Westminster (Parliament-street, &c.) Improvement Act had not yet carried out the stipulations in the Act for the protection of the interests of the Institution, and had asked for an extension of the period for doing so, which the Council had granted.

At the instigation of the Council, Her Majesty's Office of Works had undertaken to record the name of the engineer, Thomas Telford, first President of the Institution, on the structure of the Menai Suspension Bridge.

In conclusion, the Council referred to the Exhibition which had been opened under the auspices of the French Government, and which could not fail to attract all who were interested in engineering progress. The projected visit to France of many American engineers, who had promised to accept on their way the hospitality of their professional brethren here, would add



greatly to the interest of the season. The establishment, in connexion with the Exhibition, of a series of congresses on scientific subjects, was likely to be productive of much good, by developing new and valuable views on the subjects treated. Many of the leading members of the engineering profession had been invited to take part in these meetings, and the Council was sure that the Institution of Civil Engineers would meet there with due recognition.

The adoption of the report was moved, seconded, and carried, and it was ordered to be printed in the Minutes of Proceedings. Hearty votes of thanks were then passed to the President, to the Vice-Presidents, and other members of the Council, to the Auditors, to the Secretaries and staff, and to the Scrutineers.

The ballot for Council resulted in the election of Sir John Coode, K.C.M.G., as President; of Mr. G. Berkeley, Mr. H. Hayter, Mr. A. Giles, M.P., and Sir Robert Rawlinson, K.C.B., as Vice-Presidents; and of Mr. W. Anderson, Mr. B. Baker, Mr. J. W. Barry, Mr. E. A. Cowper, Sir James N. Douglass, F.R.S., Sir Douglas Fox, Mr. J. C. Hawkshaw, M.A., Mr. C. Hawksley, Sir Bradford Leslie, K.C.I.E., Mr. G. F. Lyster, Mr. J. Mansergh, Mr. W. H. Preece, F.R.S., Sir E. J. Reed, K.C.B., F.R.S., M.P., Mr. W. Shelford, and Mr. F. W. Webb, as other members of the Council.

The Session was then adjourned until the second Tuesday in November, at 8 p.m.

#### THE FORCED PERCOLATION OF WATER THROUGH CONCRETE.

SOCIETY OF ENGINEERS.

AT the meeting of the Society of Engineers held at the Town Hall, Westminster, on Monday evening last, Mr. Jonathan R. Baillie, President, in the chair, a paper on the "Forced Percolation of Water through Concrete" was read by Mr. Henry Fajja, M.Inst.C.E.

The author first referred to the paper which he read a year ago, "On the Effect of Sea Water on Portland Cement," and, after mentioning the reasons which actuated him in carrying out these experiments, described the means he had adopted in order to assure the accuracy of his results.

The head of water adopted was 21 feet, equivalent to a pressure of about 9 lbs. per square inch; this head was obtained by erecting a tank on the second floor, from which pipes were led to the ground floor, the pipes being terminated with screw couplings, to which the clamps which held the briquettes could be attached. These were so arranged that the water was forced to pass through the centre or smallest part of the briquette, where fracture would take place when tested; this arrangement, which was thought imperative, necessitated the sides or walls of the briquette being made water-tight, which water-tight covering had to be removed before the briquette could be tested. It was found by experiment that this treatment reduced its strength by 12 per cent. The clamps were of such form that the water could be forced through the concrete in either direction, and arrangements were made by which the amount of water which passed through each briquette could be measured.

In all, nearly one hundred experiments were carried out, the briquettes being, in all cases, gauged in the proportion of 3 parts of standard sand to 1 part of cement, and in order to render the experiment complete, each series consisted of ten briquettes, gauged and treated in the following manner:—

- Gauged with sea water, and placed under a pressure of sea water.
- Gauged with sea water, and placed under a pressure of fresh water.
- Gauged with sea water, and placed in a tank of fresh water, where it remained until tested.
- Gauged with sea water, and placed in a tank of sea water, where it remained until tested.
- Gauged with sea water, and left in air.
- Gauged with fresh water, and placed under a pressure of sea water.
- Gauged with fresh water, and placed under a pressure of fresh water.
- Gauged with fresh water, and placed in a tank of fresh water, where it remained until tested.
- Gauged with fresh water, and placed in a tank of sea water, where it remained until tested.
- Gauged with fresh water, and left in air.

The primary matter to ascertain was the comparative tensile strength of the briquettes treated in these different ways, the whole of each series being tested at the same date, the date being determined by the cessation of all filtration, in either direction, of water through those which were under pressure. Four different cements were used, which, beyond being assured sound, were in no way selected, so that the following average results of the tensile strength developed may be considered characteristic of the different treatments to which the briquettes were subjected.

#### AVERAGE TENSILE STRENGTH.


|                     | With 12 per cent. added. |
|---------------------|--------------------------|
| A broke at 452 lbs. | 506 lbs.                 |
| B " " 358 "         | 400 "                    |
| C " " 348 "         | " "                      |
| D " " 354 "         | " "                      |
| E " " 392 "         | " "                      |
| F " " 405 "         | 453 lbs.                 |
| G " " 372 "         | 416 "                    |
| H " " 417 "         | " "                      |
| I " " 358 "         | " "                      |
| K " " 378 "         | " "                      |

The average time during which the briquettes remained sufficiently porous to allow of the filtration of water was eighty-eight days, and the average amount of water which filtered through each briquette was 271 ounces.

The author then discussed the chemical side of the question, and, in a voluminous appendix, gave the analyses of the different cements used in the experiments, and of the briquettes, both before and after filtration, deducing therefrom the amount of lime and other matters dissolved out of the cement, and the amount and nature of the deposition which eventually filled the interstices of the concrete and stopped filtration, and, whilst admitting the value of a correct chemical knowledge of the subject, maintained that the all-important one, to the engineer, was the satisfaction of knowing that, with a good and properly-used cement, no deterioration took place through the forced percolation of water, whether sea or fresh, and concluded by saying that the results of his experiments must be as surprising to everybody as they were to himself. He did not hold with the theory that any deterioration would take place, but he certainly did not expect to find that the cement and the strength of the concrete were actually improved by the intermittent and forced percolation of water through it.

#### Illustrations.

##### ST. JOHN'S CHURCH, BARMOUTH.

 FINE elevated site for this new church has been obtained on the hill-side facing the sea,—a gradual slope up of the road giving easy access to the porches at the west end.

In plan the church consists of nave and side aisles, divided by piers and arches; choir, and chancel, with morning chapel on north side of choir, and vestries, with organ-chamber over, on the south. Over the choir is the tower, 34 ft. square outside, and rising 100 ft. high, from the base of its elevated position. With a view to meeting the large influx of visitors in the summer months to this favourite watering-place, the church has been designed to seat 1,000 persons.

It was at first intended to erect a smaller and less costly church, but Mrs. Dyson Perrins, of Plas-Mynach, near Barmouth, having generously intimated to the Rector that she would build the chancel, tower, side chapel, and vestries, to the memory of her late husband, this has led to a more ornate structure being erected, and will enable the parish to devote their efforts entirely to the nave and aisles, towards which Mrs. Perrins' son contributes the oak seats, whilst other members of the family make special gifts to the church.

The whole of the work will be carried out under the direction of the architects, Messrs. Douglas & Fordham, of Chester.

##### NEWHAM COLLEGE, CAMBRIDGE.

THIS group of buildings now accommodates about 150 resident students, besides principals and tutors. It contains besides a dining-hall, which is planned for 200, a library common to the three halls, a gymnasium, laboratory, and a hospital.

The original hall, now known as "Old Hall," was originally designed in 1873, for 22 students, but has been twice enlarged. The second in

order of erection is now known as "Sidgwick Hall." It was originally built in 1880 for 35 students, and subsequently enlarged to hold 80 students. "Clough Hall," commenced in 1886, and completed last year, is built for 50 students, and the rooms are generally larger than in the other halls. A cloister connects it with the adjoining Sidgwick Hall.

The general system is that of associated halls. Each is complete in itself, and has its own dining-hall, common-rooms, &c.

The new dining-hall at Clough Hall, however, serves also for the occasional accommodation of all the students of the College. The library is in the Old Hall, and Sidgwick Hall has lecture-rooms, with separate access for non-resident students. As no such increase of students as has taken place was originally contemplated, the grouping of the buildings, as each addition became necessary, has been a matter of some comparative difficulty.

Messrs. Bell & Sons, of Cambridge and Saffron Walden, have been the contractors for the entire work. The architect is Mr. Basil Champneys.

The drawing from which the illustration is taken is hung in the Architectural Room at the Royal Academy.

#### CHELSEA FREE LIBRARY COMPETITION.

WE publish the principal front and the principal floor-plan of the three premiated designs in the recent competition for the Chelsea Free Public Library. A plan of the principal floor of each is appended.

##### First Premiated Design.

This is by Mr. J. M. Brydon. The following extracts from Mr. Brydon's report will explain the intention of the design:—

"The entrance to the building is in the centre of the Maurea-road front. A short but wide corridor leads directly to all the rooms on the ground-floor, comprising the news-room, the lending-library, the ladies' room, and the boys' room, with the Librarian's room in their midst, and all overlooked by the Librarian or his staff.

The principal news-room may be said to be arranged in two main sections, the first, nearest the entrance, for newspapers; the second, and more retired, for magazines. It affords accommodation for 116 readers at the tables, and 100 at the newspaper-desks, or a total of 216, allowing 15 square-feet to each person, without any crowding.

Alongside the news-room is the lending-library, from which the staff can overlook the former at all times.

The accommodation for books obtained is for 22,230 vols. on the floor of the library, and 7,290 vols. in the gallery; or a total of 29,520 vols. at 9 vols. to the square foot. Ample waiting space is also provided for the public, with four indicators on the counter for 20,000 vols.—5,000 in each.

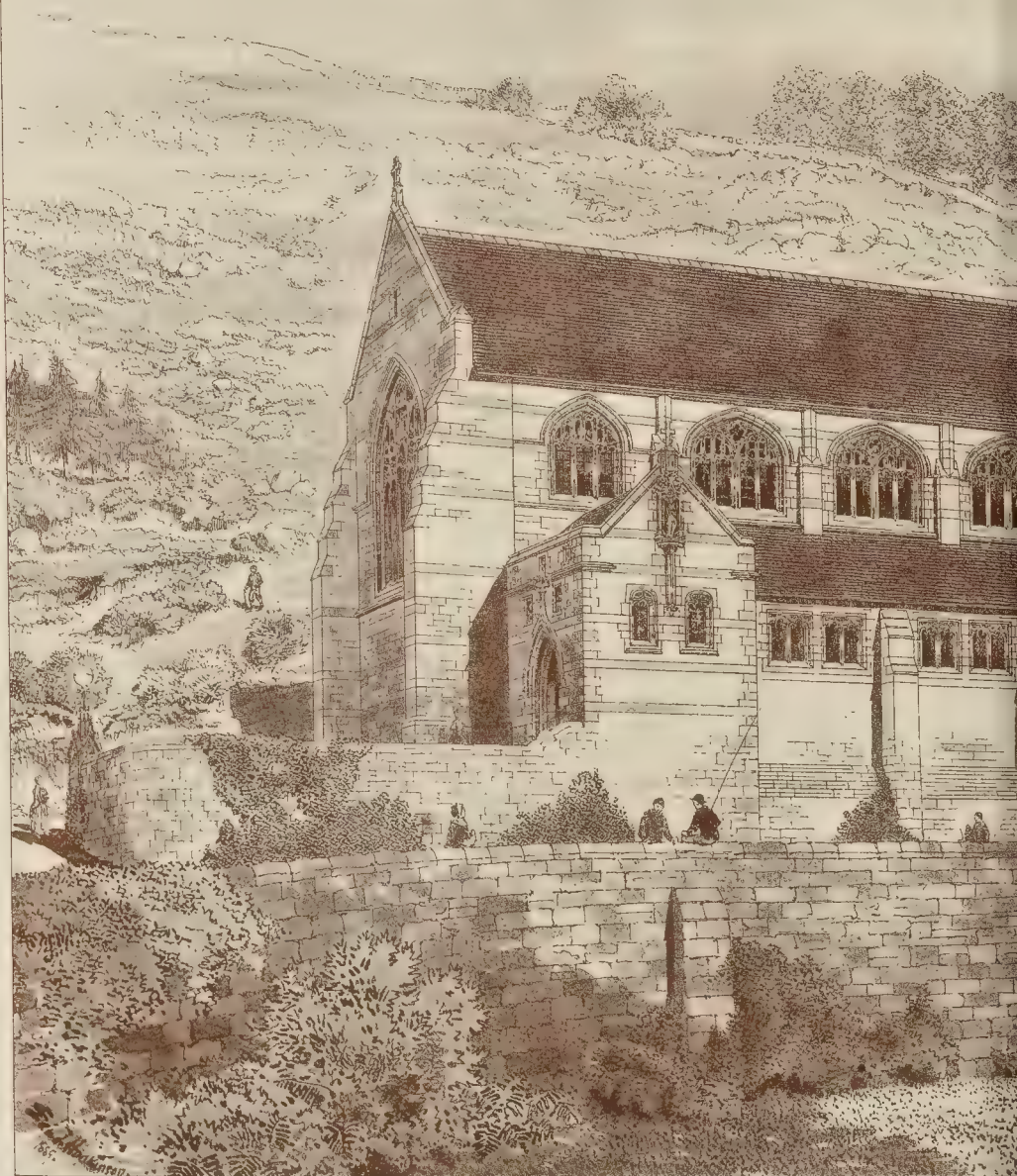
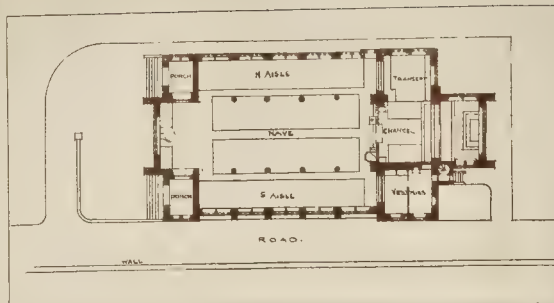
Direct access to the book stores above, and the work-room below, is secured by a staff staircase in the centre of the group. The Librarian's room is in direct communication with the lending-library, and overlooks the boys' room in front. The ladies' room occupies the remaining apartment on the ground-floor. It will thus be seen that all the rooms to which it is important there should be short and easy access for the public on the ground-floor. A staircase,—commanded from the Librarian's room,—leads to the reference-library on the first-floor. This is lighted from each end, and by a dome-light in the centre, and has a gallery for books all round. Tables are provided for 72 readers; and book space for 7,290 volumes round the room on the floor, and 8,720 volumes in the gallery, or a total of 16,020 volumes, at eight volumes per square foot. It communicates directly with the book-stores in the rear. In order to guard against all chance of damage to the books from damp, it was decided, after careful consideration, to put no book-store in the basement. They are, therefore, all on the first-floor. Two book-stores will give accommodation for 28,500 volumes, at eight volumes per square foot; and two for 30,780 volumes, at nine volumes to the square foot. It will thus be seen that book-space is provided for a grand total of 105,020 volumes, exclusive of the spare room on the second-floor.

It is proposed that the front portion shall be of red brick with stone dressings, and all the remainder behind, small side wings of stock brick—the roofs to be covered with slate.

The principal apartments on the basement and ground-floors, and the reference library on the first-floor, are proposed to be laid with wood-block flooring, the floors themselves being of fire-proof construction throughout. The entrance-hall on the ground-floor is intended to be paved with cement mosaic, and the staircases to be of stone, except the staff-stairs, which will be of iron, with wood-block treads. The dado under the window-sills of news-room is intended to be lined with glazed pattern tiles,—a great advantage on the score of cleanliness, and decorative besides. The walls above the dado







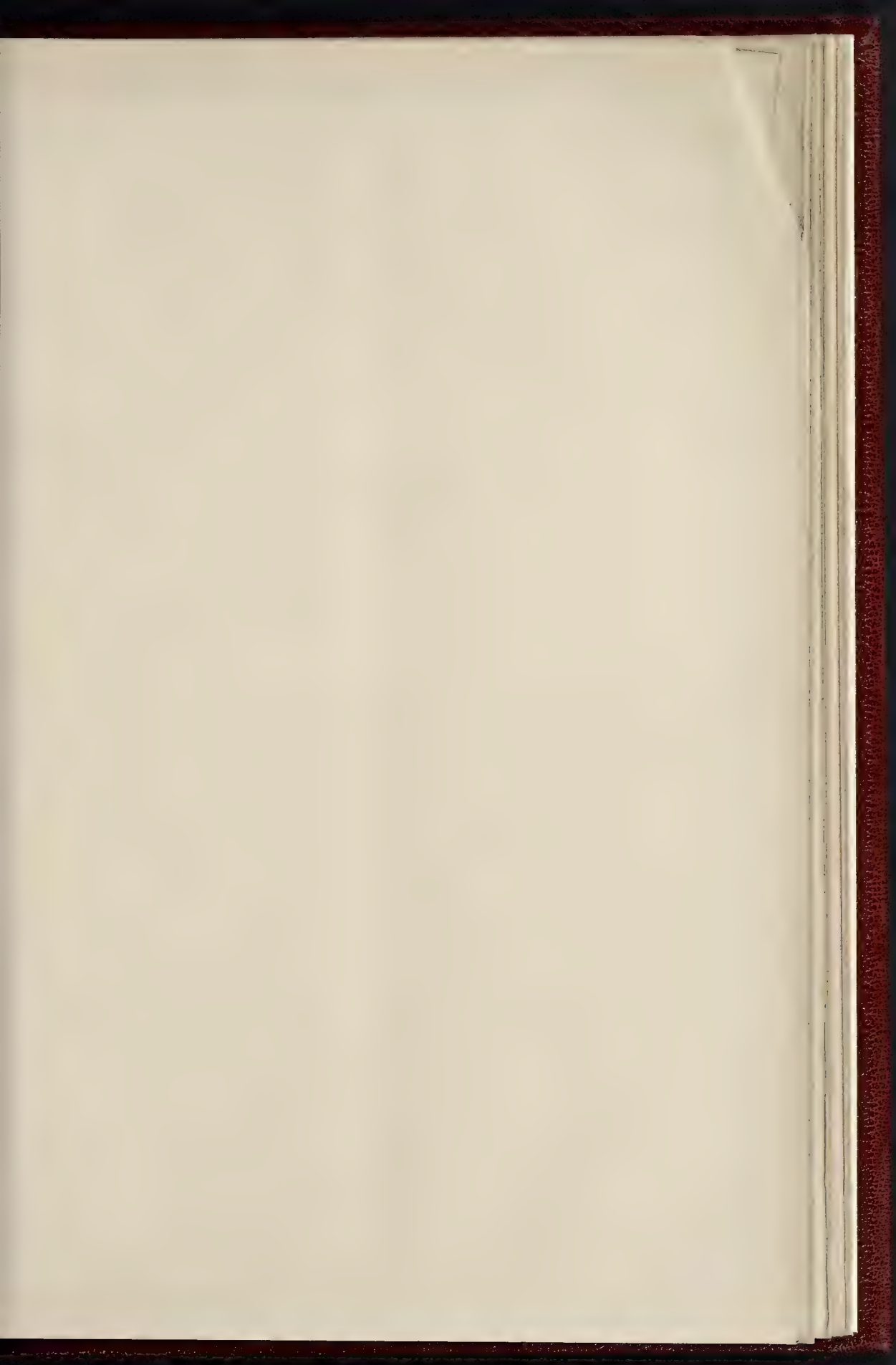
ST. JOHN'S CHURCH, BARMOUTH, N. W.



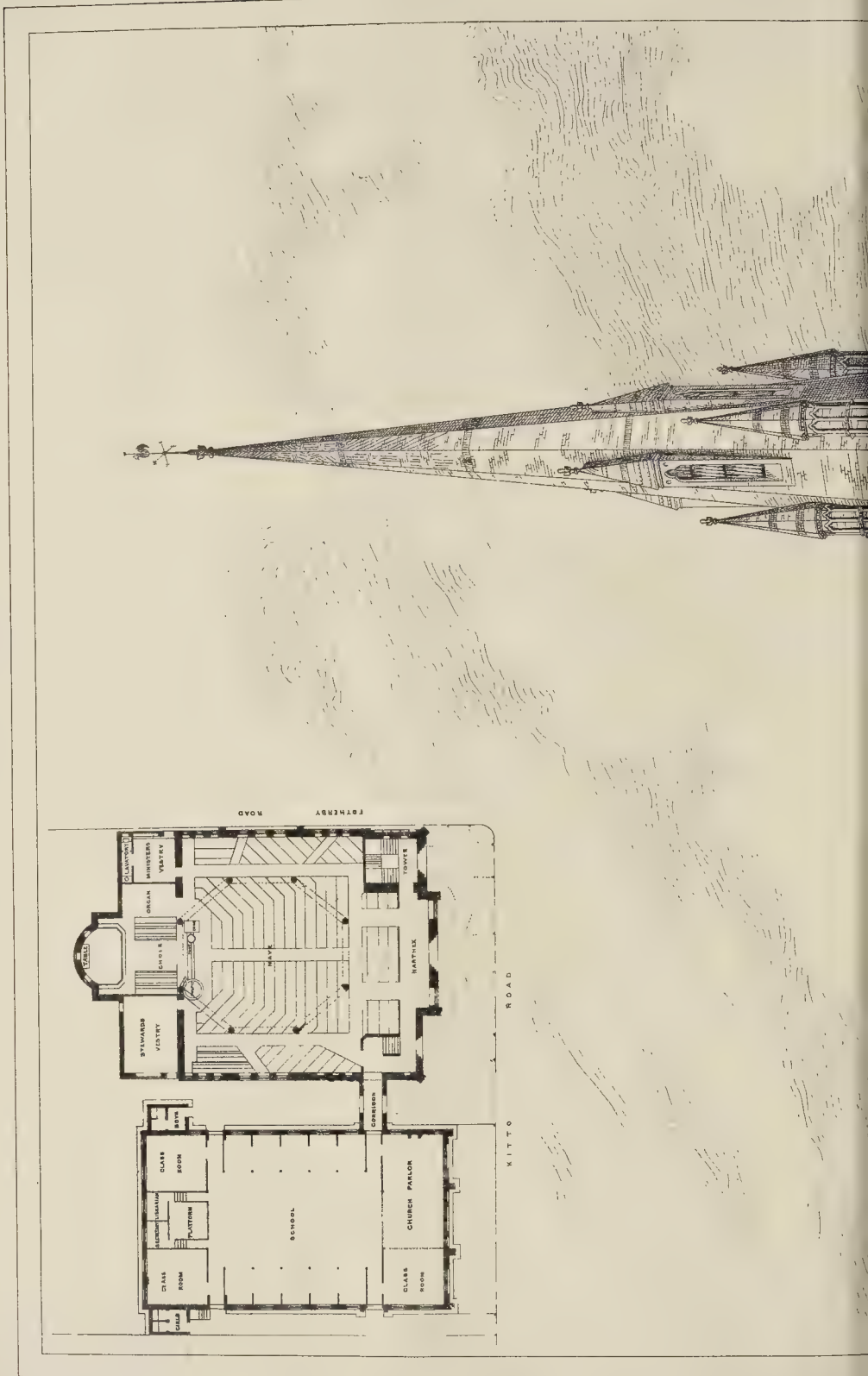








THE BUILDER, JUNE 6, 1889.







WESLEYAN · CHAPEL · AND · SCHOOLS · KITTO · ROAD · PECKHAM ·

E · HOOLE · F.R.I.B.A. ARCHITECT ·

PHOTO LITHO · GERRARD & CO · 22 MARTIN LANE · LONDON · W.C.









Front Elevation to Manresa Road :

10 5 0 10 20 30 40 50 feet

SECOND PREMIATED DESIGN.  
MR. E. W. MOUNTFORD



Elevation to Manresa Road

Scale of 10 5 0 10 20 30 40 feet

PHOTO. THO SPRAGUE & CO 22 MARTIN LANE LONDON E.C.



THIRD PREMIATED DESIGN.  
MESSRS. LEACH & BAGGALLAY.



Elevation to Manresa Road.

0 5 10 30 50 feet

ALTERNATIVE DESIGN.  
MESSRS. LEACH & BAGGALLAY.

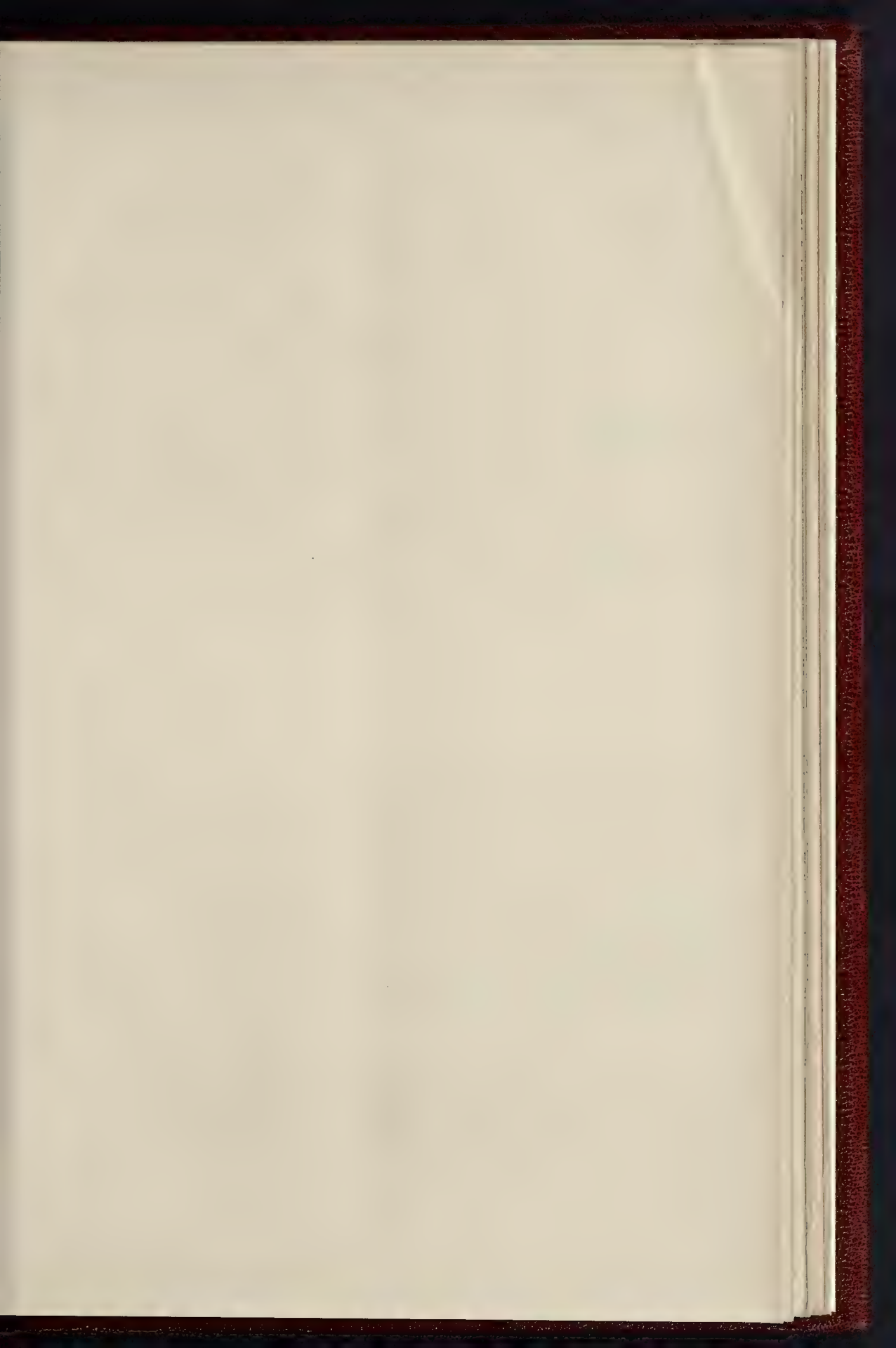


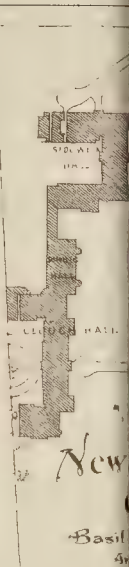
Elevation to Manresa Road.

PHOTO. L. THO. SPRAGUE & CO. 22, MARY W. LANE, CANNON ST. LONDON E.C.











ation of  
The Site

College

h. 3

33



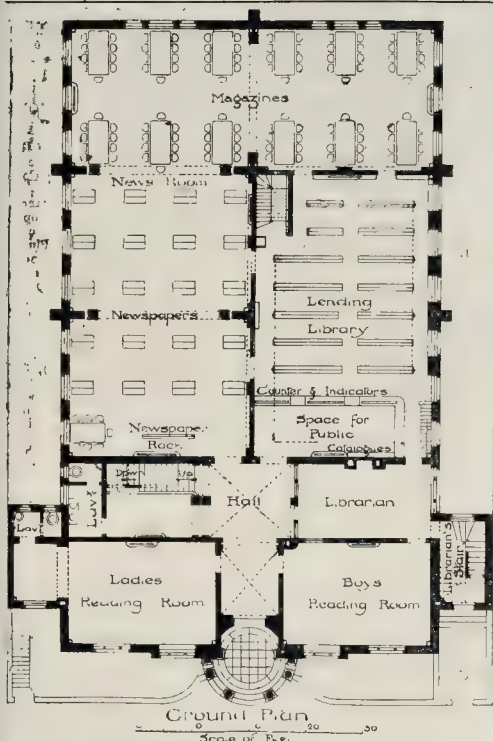
21. General View from the South



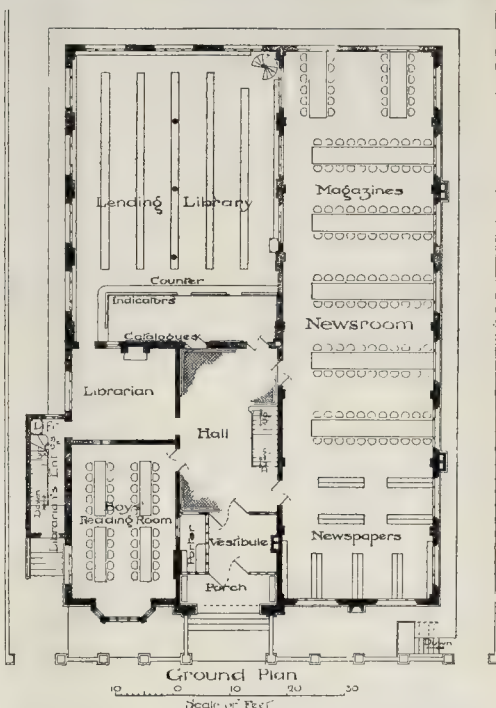
22. PHOTO, SPRAGUE & CO. 22, MARTIN LANE, LONDON W.C.



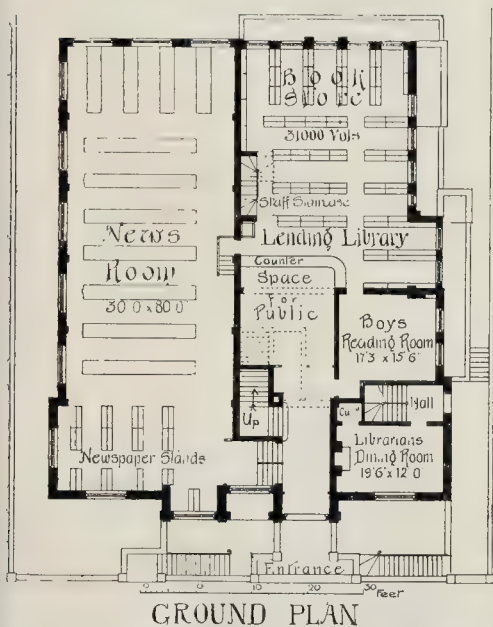




Plan of First Premiated Design.—By Mr. J. M. Brydon.

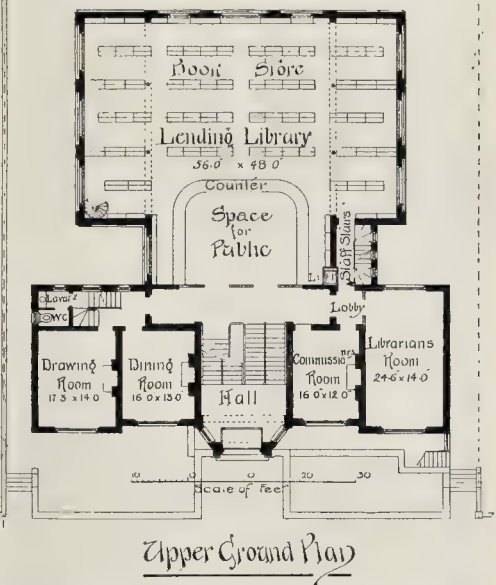


Plan of Second Premiated Design.—By Mr. E. W. Mountford.



GROUND PLAN

Plan of Third Premiated Design.—By Messrs. Leach &amp; Baggallay.



Upper Ground Plan

Plan of Alternative Design.—By Messrs. Leach &amp; Baggallay.

CHELSEA FREE LIBRARY COMPETITION.—PLANS.

would, for the present, be left in plain colour on the plaster.

The warming will be by hot water throughout, but fire-places have been introduced in some of the rooms, where considered desirable, and in the residences. Fresh air will be admitted by Tobin's tubes in the side walls, more especially in the news-room, which is liable to become overcrowded. The

cove under the ceiling of the news-room will be utilised as an extract-shaft for vitiated air, with openings into it, as shown on the sections, communicating with the Boyle's air-pump ventilators on the roofs of the book-stores above. The lending library will be ventilated in a similar manner, and the ladies' and boys' rooms provided with extract-flues carried up in the chimney-shafts.

#### Second Premiated Design.

Mr. E. W. Mountford, the author of this design, writes:—

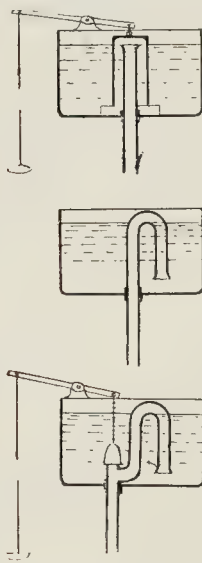
"From the instructions it was obvious that the first thing to be considered was the reading-room, which therefore occupies the whole of one side of the site, with large windows in three sides and two

## The Student's Column.

## TOWN DRAINAGE.

## XXIII.—SIPHON CISTERNS.

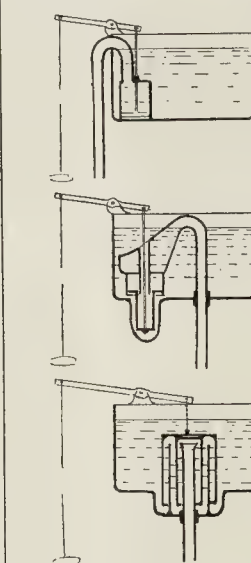
**P**NEUMATIC action has been brought to bear upon the discharge of water from waste-preventing cisterns in several different ways. There are two chief forms,—the vacuum and the plenum processes. With regard to the vacuum process, no real vacuum is possible or attempted to be produced, and the term relates only to a slight reduction of the atmospheric pressure within a pipe while full pressure exists outside the pipe. It brings into play the normal pressure of the atmosphere on the greater portion of the surface of water in a cistern, while from a portion of that surface the pressure is temporarily reduced. If a pipe be set up in a cistern, the bottom of the pipe being closely attached to the bottom of the cistern and the top of the pipe open, and if the cistern be supplied with water until it rises to the top of the pipe, the water will flow into its mouth at the same rate as that with which it comes into the cistern,—say, two or three gallons in a minute if situated high above-ground, or three or four gallons if near the ground level, the time in either case varying with the size of the supply-pipe and pressure of water in the street main, but in no case being more than a small stream of water.



But let this upright pipe be surrounded by a larger one, with a considerable space between the two, and let the bottom of the outer pipe or cylinder be open and its top closed, and let it rest upon three or four studs at the bottom of the cistern, equidistant round the foot of the inner pipe, and 2 in. or 3 in. high. There will then be a waterway under the edge of the outer pipe and up through the space between the two pipes (fig. 1). Under these conditions the pressure of the atmosphere upon the top of the outer pipe, cylinder, or cap, will be that of the atmosphere,—say 14.7 lbs. per square inch, which is the weight of the atmosphere when heavy enough to support a column of mercury 30 in. high. As long as this outer cylinder or cap rests upon its supports at the bottom of the cistern there is the same pressure upwards against the underside of its close top, so that if it were lifted up its own weight would be the only weight to be raised, except that the act of lifting it immediately alters the relative pressures. While at rest, the water in the annular space between the two pipes stands level with the open top of the inner one, the space above this level, between it and the underside of the outer pipe or cap, containing air of the same density as that outside. If the bottom end of the inner pipe be closed, either by a valve opening outwards or by dipping into water so that no air can ascend through the pipe, and if the outer

pipe or cap be now raised, the density of the air in the space between the top of the inner pipe and the underside of the outer one will be reduced by being made to occupy a larger space, and its pressure per square inch will be reduced in a corresponding degree, being 1 for a space of 1,  $\frac{1}{2}$  for a space of 2,  $\frac{1}{3}$  for a space of 3, and so on in other degrees.

The pressure per square inch of the air at the top of the inner pipe and on the surface of the water in the annular space between the two pipes being thus reduced below that upon the surface of the water in the cistern, the difference thus created causes a flow of water to take place upwards through the annular space, and down the pipe at a rate of flow much greater than that with which the cistern is supplied. The dimensions of the parts are made so as to give a rate of flow of about two gallons in five seconds, but there is no difficulty in increasing this rate of flow, even to a greater degree than would be desirable. The flow through the siphon thus brought into action would continue until the surface of the water in the cistern fell to the bottom of the outer pipe. It is necessary, therefore, to limit the size of the compartment in which the stipulated quantity of water be discharged at once, the small compartment being re-filled through a short pipe communicating with the cistern, supplied through the ball-valve or ball-cock. The old two-way "cock" is now usually replaced by a



valve, which does not leak so much with wear.

This form of siphon is the fundamental form of any siphon, but there are various improved ways of bringing it into action. What is aimed at in the vacuum process is to reduce the air-pressure in the descending pipe by forcing out a part of it by a charge of water, whereupon the reduced pressure of the remainder allows such a preponderance to the atmospheric pressure that the whole body of water in the compartment is forced out. If a bent tube be fixed in a cistern as in figure 2, its mouth reaching nearly to the bottom of the cistern, and the cistern be filled with water through the ball-valve until it reaches the bridge of the bent tube, forcing the air before it, the water then begins to fall into the descending pipe, and carries a part of the air with it by contact. This increases the rate of flow of the water, until, increasing faster and faster, it soon fills the throat of the pipe and carries all the remaining air with it, producing a still more rapid flow, so that the compartment is quickly emptied. But in this simple form the action does not begin soon enough for the convenience of water-closets and other house-fittings. Means are adopted therefore to bring it at once into action on the pulling of a chain or the lifting of a handle. In figure 3 is a vertical branch on the bent

tube, its mouth being closed by a valve. The valve is connected by a chain to the lever over it, and is opened in the same way as is the similar valve of the double-valve cistern before mentioned. As soon as this valve is opened, the water descends the pipe and reduces the pressure of the air in it, and, although the valve be dropped again into its place almost immediately after opening it, the water continues to flow out of the compartment through the bent tube, which enters the descending pipe below the valve-seat. That or some similar means must necessarily be adopted in any form of the vacuum process in which the action is begun by the movement of the lever belonging to the water-closet apparatus; but there is another means of starting the siphon,—the plenum process,—by which a part of the water in the compartment is lifted bodily into the mouth of the descending pipe of the siphon, as in Braithwaite's form (fig. 4), or in Lee, Howl, & Co.'s (fig. 5).

The figure 6 shows the general form of Humpherson's siphon, as made by Messrs. G. Farnill & Sons, in which there is an inner, and an outer cap over the descending pipe, each having at the bottom a flange projecting inwardly, and there is a standing partition between the two caps. The internal flanges lift a small quantity of water into the mouth of the pipe, which starts the siphon, the action of which continues with full force to the last. A similar form of siphon is made to work automatically for urinals by Mr. Milton Syer. These are but a few of the many forms of siphon cistern, but they may serve to show the principles on which most of them are constructed.

## Books.

"Graphics;" or, the Art of Calculation by Drawing Lines. Part I. By Professor ROBERT H. SMITH, of Mason College, Birmingham. 1889. Published by Longmans, Green, & Co., London and New York.

THIS ingenious book is accompanied by an atlas of diagrams, neatly drawn and separately bound. The plates are numbered, and reference to the figures is considerably aided by the diagrams being numbered consecutively, without regard to the number of each plate.

A comprehensive glossary of special terms and symbols is provided, which must be first learned before studying the book, and the application of these terms and symbols is explained upon page 86. The author seeks to apply new graphic methods to the solution of the various problems which are met with in mechanical engineering, but the question is, Will civil and mechanical engineers employ these new methods? The accomplished practitioner is prejudiced against all such new systems, which need constant practice to be remembered, and no conscientious employer would trust to results worked out by an assistant who uses a method to which the employer is not accustomed. The author himself properly states on p. 112 that "the student should in no case be content to employ graphic processes without clearly and accurately understanding the physical interpretation to be put upon them." We approve of graphic methods, but those shown by the author require more frequent use to be remembered than the ordinary draughtsman is called upon to employ. The book aims at avoiding formulae, and yet in chap. X. provides a formula for determining the number of joints compared with a given number of bars or links.

The author's remark on p. 4 as to the degree of approximation which may be relied upon in calculation is very good; also his caution upon p. 21 as to possible errors in intersecting points when badly defined by the use of ill-conditioned triangles; yet he admits on p. 25 that, of necessity, ill-conditioned triangles must be sometimes used in complicated graphic constructions to avoid changing the scale of the diagram. On p. 19 he gives the preference to the use of a pair of dividers over a finely-divided scale for the purpose of transferring lengths from one line to another. His hints on p. 70 as to the avoidance of confusion and obscurity in a diagram by avoiding the drawing-in of unnecessary lines upon a drawing are worthy of attention. On p. 165, the author states "no forces act through mathematical points; they are all more or less distributed through certain volumes or masses, and act always through sectional areas of finite magnitude;" while, as remarked on p. 89, quoting from Professor



Clerk Maxwell, "any one who will try to imagine the state of a mind conscious of knowing the absolute position of a point, will ever after be content with our relative knowledge."

The occasions mentioned in the preface, when "the aid of the more complicated portions of algebraic and trigonometrical mathematics, or of the differential and integral calculus" have to be called in, do not frequently occur, and when they do occur, the symbols employed in this book would need looking up before the methods advocated by the author could be correctly applied. After perusing this book, we cannot say we have been informed of much that can be generally employed as an improved method for the investigation of the strength of structures. It is interesting to note that the theoretical development of graphic methods is chiefly due to Cremona, an Italian, as well as to Culmann, a German; also that it was Professor Clerk Maxwell who first investigated the reciprocity which exists in the geometrical relations between an outline of a structure and a force diagram. We quite agree with the author that the notation used by Mr. R. H. Bow, the earliest invention of which is ascribed to Professor Henriot, is undoubtedly the best system for marking stress-diagrams; but we fail to see the practical merit of showing how ordinary arithmetical addition, subtraction, multiplication, and division, may be effected by a graphic method as set forth in the earlier chapters of the book.

**Practical Surveying.** By G. W. USILL, Assoc. Mem. Inst. C.E. London: Crosby Lockwood & Son.

THIS compact treatise is intended as a text-book for the use of students preparing for examinations or for survey work in the colonies. It contains many useful and original suggestions, and is accompanied by four lithographic plates and upwards of 330 illustrations. The names of certain makers appear on some of these illustrations, while, in the case of other instruments, no maker is named.

The index to the illustrations supplied at the commencement of the book is valuable to the student for reference when, in the future, he finds that he does not employ some of the special instruments very frequently. The table of contents and the index supplied are both useful. After six pages of introduction, the author deals with ordinary surveying, in which his remarks upon the approximation to lengths arrived at by the system of pacing are very good. Respecting offsets, the author's general preference for an offset-staff cannot be followed in every instance. Tape measurements are in many places most useful for offsets. The author very properly expresses the opinion that accurate chaining may be accomplished by carefully stepping the chain over sloping ground, as the method of calculating the horizontal from the hypotenusal measurements by the tables given on p. 22 is not the plan generally adopted. It is mathematically true, and would prove the easiest method if ground could be found to slope regularly like the slant of a roof; but, as a rule, the ups and downs to be passed over are very irregular, and some high point may intervene upon the line of sight in determining the angle between a distant station and the horizontal. The chapter on surveying instruments is well illustrated and described, while the succeeding chapter, entitled "Trigonometry as applied to Surveying," is more theoretically written than as applied in practice to surveying. Chapter V., on "Chain Surveying," favours the use of a single line in the field-book for recording the chain measurements. We prefer the usual double line column, as shown in the author's Field Book illustrating "Theodolite Surveying," and do not agree with the opening remarks of the following chapter that "it seems hardly necessary to say that all important surveys are now executed with the theodolite or other instrument for obtaining the angles which a line or lines make with another." It is true that in an extensive survey the long lines can be best ranged with a theodolite, but in open country the base lines are most accurately connected by chain measurements, and the theodolite is used for taking the angles as little as possible. We agree with the author that the most reliable, as well as the most expeditious, system for setting out curves is by the use of the theodolite (p. 212). In the author's illustration of the Level Book, the system termed "the right way" is not the best way. The better plan is to enter

a back-sight when taken upon the same point as the previous fore-sight, in the same line, as shown in the system which the author terms "the wrong way" (p. 187), the description of these points in the column of remarks being the same. This is the method adopted by the author in his Level Book for contour levels (p. 209), and it is a pity he has not adopted the correct method in his previous chapter. The paragraph headed "As to Distances" is very good. The author very properly recommends the surveyor to make his assistants thoroughly understand their duties and his requirements (p. 198), adding that by a code of signals mutually understood, a great deal of satisfactory work may be accomplished in almost dumb-show; and he provides, at the conclusion of the book, a very practical chapter upon office work, and some useful hints upon the calculation of land quantities.

**Applied Mechanics.** By DAVID ALLAN LOW.

Published by Blackie & Son. 1889. THIS little book is well arranged, and is a most serviceable book for teachers. The principles appear to be correctly enunciated, the index is thoughtfully compiled, and the examples are well worthy of the term "Applied," which is given in the title of the book. The answers are given at the end, so that the student may test the results of working out his calculations. A good feature in the work is that the student is enabled to pass over the more difficult portions at a first perusal of the book, the more advanced paragraphs being marked with an asterisk for future study. The chapter upon the nature and use of materials in construction is very practical, but in the succeeding chapter, on the resistance to tension, compression and shearing, we should have liked to see more said about the properties and capabilities of mild steel, which is now so much employed in construction. The work concludes with a syllabus from the Directory of the Department of Science and Art. The price is only two shillings, and as an elementary text-book we can heartily commend its perusal to our readers.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

8,334. Fastenings and Hinges for Doors.

J. T. Hopkinson.

The box or staple for door bolts or chains which is the subject of this invention is made with an angle-plate for attachment to the door-frame, so that there are two sets of fixing-screws at right angles to each other. This prevents the box or staple from being forced off. Butt-hinges are similarly formed of two angle-plates attached to the door and frame respectively.

8,338. Improved Weather-bar for Doors and Windows.

H. J. Langbury.

According to this invention, a bar or strip of wood is hinged to the door, or recessed into it. When at rest, the weather-bar projects below the bottom of the door, and is held in position by a spring. When the door is opened, the bar, which projects a little at the side, coming against the frame of the door, is forced to rise in its bearings. When the door is closed, the weather-bar falls to its normal position.

8,831. Crashing and Mixing Mortar.

E. Chatham.

According to this invention, the lime and sand are put into a cradle or trough and rocked. In the centre of the cradle is mounted a roller, which works the lime and sand thoroughly together.

9,360. Ventilators.

J. and W. Cormack.

The apparatus which is the subject of this patent is fitted at or on the outlet of the chimney, and at or near the top of ventilator are formed the side openings forming the outlet. A conical cylinder hangs suspended near the openings, and the wind, blowing against one side, causes the trumpet-shaped orifice in the cylinder to move and close the opposite opening, thus preventing back or down draught.

4,806. Elastic Tiles.

Sir E. J. Harland.

The tiles which are the subject of this patent are made of vulcanised rubber, and are cemented to the floor. Being soft and elastic, they afford an excellent foothold, and are thus useful for decks, cabins, &c., at sea. The slightly-yielding nature of the material renders traffic over them noiseless, and enables such flooring to stand wear and tear in entrance-halls, landings, &c. Being impervious to water, they form a cleanly floor in smoking-rooms and smoking-carriages.

5,400. Safety Window-fastenings.

W. J. Thomas and W. Strong.

The catch of the fastener which is the subject of this patent is so formed as to drop into a notch and

form a double fastening, which is further secured by the action of a metal projection.

##### NEW APPLICATIONS FOR PATENTS.

May 20.—8,331, W. & B. Clarke, Tilting, Slabbing, and Paneling Surfaces.—8,332, R. Taylor, Window-sash Fastener.—8,331, G. Butt, Screws and Nails.

May 21.—8,400, J. Porter, Electric Bell.—8,428, M. May, Artificial Stone.—8,435, W. Thompson, Fastening Window-sashes, Folding-doors, &c.—8,444, W. Macdonald, Sash-fastener.—8,463, D. Brown, Ventilators.

May 22.—8,482, J. & A. Duckett, Water-closets and Flushing-tanks therefor.—8,511, E. Busby, Bricks, Tiles, &c.—8,513, T. Hughes, Roofing, &c.—8,517, J. Churchill, Ventilating.—8,535, O. Elphick, Lavatories.

May 23.—8,546, T. Horner, Hinges.—8,563, C. Showell, Door, Sash, and other Handles.—8,572, C. Taylor, Plane-Irons.—8,595, C. Ashworth, Emergency Exits for Theatres, &c.—8,615, H. Stany-nought, Door-checks.

May 24.—8,620, R. Cousins, Girders.—8,623, J. Sykes and T. Cook, Securing Door-handles to Spindles.—8,625, J. Redpath, Cooking-ranges or Fireplaces.—8,642, T. Count, Sash Window-frames and Means of Opening and Closing the Sashes.—8,654, F. Davies, Fastenings for Doors, Windows, &c.

##### PROVISIONAL SPECIFICATIONS ACCEPTED.

3,516, A. Ferrett, Windows and Window-fastenings.—5,644, T. Shouler, Turns or Fasteners for Cupboard-doors.—5,967, C. Gardiner, Fence for Planes.—6,054, R. Wilding, Ventilation of Water-closet Basins, &c.—6,101, T. Dault, Casement Windows and Doors.—6,165, H. Adeane, Fixing Sash-lines to Sashes.—6,261, F. Marton, Chimney-pots.—6,389, Sir E. Harland and C. Gray, Elastic Tile-floorings, &c.—6,573, S. Wilmot, Metallic Roofs.—6,655, H. Heim, Fireplaces.—6,774, J. Tata and J. Lyon, Mosaics.—6,953, J. Martindale, Ventilating and Chimney Cowls.—7,525, S. and W. Dearn, Stone-cutting or Sawing Machinery.—7,593, A. Hogan, Preventing the Bursting of Water-pipes by Frost.

##### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

9,273, C. Bennett, Laying and Fastening Wooden Flooring.—9,343, F. Hodges, Mitering Bench and Vice.—9,968, W. Lindsay, Bridges.—14,402, W. Ross, jun., Siphon Drain-pipes.—14,405, E. Edwards, Window-sash Fasteners.—1,282, J. Haunay, Whitelead, &c.—2,531, G. Newman, Spring Hinges and Door-closers.—2,702, E. de Meier and T. Greenwood, Paper Stucco.—2,844, A. Ponton and others, Artificial Stone.—6,393, P. Simon, Plate-glass.

##### RECENT SALES OF PROPERTY:

###### ESTATE EXCHANGE REPORT.

MAY 21.—By Messrs. COUS (at Rochester).

Rainham, Kent—F. residence, with grounds, r. 435 p.s. 2750  
Three f. cottages and a plot of land 620  
Stood, London-rd.—Two f. residences 2,450  
A piece of nursery ground, f. 400  
F. house, shop, and premises, r. 239 p.s. 800  
Cuxton-rd.—A plot of land with stabling, f. r. 420 p.s. 310  
A stone-mason's yard adjoining, f. r. 238 p.s. 550  
"Sydenham House" and a plot of land, f. 1,000  
"Ucomb House" and plot of land, f. r. 420 p.s. 600  
Gaula.—F. cottage, r. 233 p.s. 470

MAY 27.—By G. A. WILKINSON.

Hornsey—Three houses, with workshops and yard, c. r. 289, 189, 0. 860  
Forest Hill, Honor Oak Park—"Bewdon Mount," u. 75 yrs, g.r. 213, 10s, r. 475 p.s. 610  
Upper Harefield-rd.—"Horne Villa," u. 85 yrs, c. r. 47, e.r. 250 p.s. 535  
Stabling and plot of land, u. 85 yrs, g.r. 44, e.r. 420 p.s. 200  
New Cross—37, Laurie-grove, l. 60

By J. LEE.

Reigate—"Percy Cottage," f. r. 251 p.s. 950  
By E. WOOD.  
Camberwell—36 to 48 (even), Chiswell-st., u. 74 yrs, g.r. 226, 5s, r. 2109 p.s. 465  
Clapham—122, Manor-st., u. 10 yrs, no g.r., r. 232, 10s, p.s. 175  
Buckhurst-hill—1, Chalfont-rd., u. 77 yrs, g.r. 24, r. 222 p.s. 170  
Finsbury-park—2, Pimlico-rd., u. 80 yrs, g.r. 25, 10s, r. 222 p.s. 250

By F. C. TAPPIN.

Battersea-rise—9 and 11, Northcote-rd., f. r. 2110 p.s. 1,600  
Westham, Kent—A plot of f. land, 3a. 0r. 20p. 325  
Swanley—"Beaufort House," u. 83 yrs, g.r. 210, with possession. 225

MAY 28.—By C. & H. WHITE.

Pimlico—33, Eaton-ter., u. 33 yrs, g.r. 27, r. 295 p.s. 1,080  
Wandsworth—150, Trinity-rd., f. with possession 1,680  
Walworth—52 and 58 (even), East-st., f. r. 2138 p.s. 880  
Camberwell—260, Southampton-st., f. 3,850  
268 to 270, Southampton-st., f. 1,680  
Brixton—19 and 21, Ingleton-st., u. 15 yrs, g.r. 24, 5s, 6d, r. 236 p.s. 215  
Vauxhall—14, Chapter-st., u. 37 yrs, g.r. 23, r. 239 p.s. 180

By BALL, NORRIS, & HADLEY.

Forest Gate—132, Osborne-rd., u. 93 yrs, g.r. 25, 12s, r. 228 p.s. 325



|                                                                                               |       |
|-----------------------------------------------------------------------------------------------|-------|
| Barnsbury—62 and 64, Westbourne-rd., u.t. 70 yrs., g.r. £14, r. £34 p.a.                      | 4775  |
| Battersea—15, Albert-rd., u.t. £38 p.a., g.r. £26, 6s., r. £33 p.a.                           | 335   |
| By A. BOOTH.                                                                                  |       |
| Camden-rd.—Nos. 151, 153, and 155, u.t. 66 yrs., g.r. £33, r. £301 p.a.                       | 3,650 |
| By F. PARKS.                                                                                  |       |
| West Dulwich—27, Chancellor-rd., f., e.r. £34 p.a., f., e.r. £50 p.a.                         | 320   |
| Brookwood-rd.—"Alva" and "Elcho" cottages, f., e.r. £20 p.a.                                  | 575   |
| "Oatage Cottage," f., r. £22 p.a.                                                             | 250   |
| F.g.r. of £3, with reversion in 70 yrs. to e.r. of £60                                        | 175   |
| "Clifton Cottage," u.t. 70 yrs., g.r. £4, e.r. £30 p.a.                                       | 185   |
| By E. & H. LUMLEY.                                                                            |       |
| Kennington—9, Pitt-st., u.t. 54 yrs., g.r. 2s. 6d., r. £25 p.a.                               | 1,250 |
| Goring-on-Thames—Two plots of f. land, 5a. 0r. 17p.                                           | 750   |
| By W. & F. HOGGARTON.                                                                         |       |
| Loughton—"Gurner's Cottage," f., with possession                                              | 310   |
| Walthamstow—"West View," with stabling, f., e.r. £15 p.a.                                     | 620   |
| By Messrs. COOTE.                                                                             |       |
| Shafesbury-avenue—6, Archer-st., f., r. £105 p.a., g.r. £105 p.a.                             | 2,520 |
| Station-sq.—10, Gerald-st., u.t. 34 yrs., g.r. £8, r. £85 p.a.                                | 1,800 |
| MAY 28.—By GODDARD & CHIFFORD.                                                                |       |
| Brentford—189 and 194, High-st., f., r. £70 p.a., g.r. 191 and 192, High-st., f., r. £80 p.a. | 1,300 |
| By RUSHWORTH & STEVENS.                                                                       |       |
| Chelsea—21, Marlborough-sq.; and 60 and 60A, Calc-st., u.t. 20 yrs., no g.r., r. £50 p.a.     | 630   |
| By R. TINSY & SON.                                                                            |       |
| Highbury—69 and 61, Mossel-rd., f., r. £50 p.a.                                               | 635   |
| By THE CHURCH WOOD CO.                                                                        |       |
| West Ham, Neville-rd.—Two f. houses, r. £84, 10s. p.a.                                        | 600   |
| 15, 14, and 16, Charles-st., u.t. 88 yrs., g.r. £10, 10s., r. £30 p.a.                        | 67    |
| By R. E. CROUCHER & CO.                                                                       |       |
| Green-lanes, Hatfield-rd.—A plot of f. land, 2a. 0r. 21p.                                     | 400   |
| By F. JOYCE & CO.                                                                             |       |
| Upper Clapton—93, Casford-rd., u.t. 84 yrs., g.r. £14, e.r. £90 p.a.                          | 980   |
| Hackney—107, King Edward-rd., u.t. 50 yrs., g.r. £6, 10s., e.r. £45 p.a.                      | 375   |
| 70, Lauriston-rd., u.t. 53 yrs., g.r. £7, e.r. £48 p.a.                                       | 330   |
| By JONES & SON.                                                                               |       |
| Mile-end—95, Turner-rd., u.t. 78 yrs., g.r. £4, 10s., r. £30 p.a.                             | 280   |
| Limehouse—25 and 26, Dixon-st., u.t. 68 yrs., g.r. £6, 8s., r. £81 p.a.                       | 615   |
| 45 and 46, Dixon-st., u.t. 69 yrs., g.r. £3, 8s., r. £62 p.a.                                 | 595   |
| 37 and 39, Copenhagen-pl., u.t. 61 yrs., g.r. £3, r. £57 p.a.                                 | 335   |
| MAY 30.—By EASTMAN BROTHERS.                                                                  |       |
| Bethnal-green—102 and 112, Green-st., u.t. 38 yrs., g.r. £10, 6s., r. £38 p.a.                | 485   |
| By GEO. GORDON & CO.                                                                          |       |
| Plumstead—2, St. John's-villa, f., r. £22 p.a.                                                | 345   |
| Horton—30, Gifford-st., u.t. 11 yrs., g.r. £2, 10s., r. £24 p.a.                              | 60    |
| By NEWBORN & HARDING.                                                                         |       |
| Holloway—A profit rental of £70 p.a., u.t. 75 yrs., f., e.r. £10, 10s., r. £32, 10s. p.a.     | 1,270 |
| Finchley-pk.—8, Adolphus-rd., u.t. 84 yrs., g.r. £10, 10s., r. £32, 10s. p.a.                 | 475   |
| Horton—15 and 16, Buckland-st., u.t. 46 yrs., g.r. £10, r. £74 p.a.                           | 700   |
| Uxbridge—16, Theobald-st., u.t. 29 yrs., g.r. £8, r. £48 p.a.                                 | 1,065 |
| Kingland—87, 89, 95, and 97, Colford-rd., u.t. 31 yrs., g.r. £3, r. £38 p.a.                  | 1,055 |
| 101 to 107 (odd), Colford-rd., u.t. 31 yrs., g.r. £9, 10s., r. £123 p.a.                      | 1,170 |
| 41, Upton-rd., u.t. 31 yrs., g.r. £3, 10s., e.r. £32 p.a.                                     | 255   |
| I.g.r. of £25, u.t. 30 yrs., at a g.r. of £14 p.a.                                            | 140   |
| I.g.r. of £5, u.t. 26 yrs., at a g.r. of 5s. p.a.                                             | 60    |
| By E. STANSON.                                                                                |       |
| Clarendonwell—1, g.r. of £40, u.t. 22 yrs.                                                    | 470   |
| Gray's-inn-rd.—12, Wilson-st., u.t. 21 yrs., g.r. £3, r. £10 p.a.                             | 370   |
| Chislehurst, Church-row—"Lime Villa," u.t. 51 yrs., g.r. £5, r. £30 p.a.                      | 550   |
| South Lambeth—"The Mawbey Arms," f., r. £25 p.a.                                              | 810   |
| Westminster—I.g.r. of £55, u.t. 9 yrs., at a g.r. of 5s. p.a.                                 | 225   |
| Kingland-road—I.g.r. of £75, u.t. 17 yrs., at a g.r. of £45 p.a.                              | 200   |
| 66, Tottenham-rd., u.t. 30 yrs., g.r. £2, r. £30 p.a.                                         | 215   |
| Walworth—8, Sutherland-sq., u.t. 53 yrs., g.r. £4, r. £42 p.a.                                | 240   |
| MAY 31.—By F. HODGSON.                                                                        |       |
| New Southgate—1, Bella-villa, u.t. 90 yrs., g.r. £3, r. £32 p.a.                              | 280   |
| 9, Bella-villa, u.t. 90 yrs., g.r. £8, with possession                                        | 210   |
| The residence called "Parkhurst," f., with possession                                         | 450   |
| Parkhurst-road—Two plots of f. land                                                           | 60    |
| By BAXY, YOUNG, & CO.                                                                         |       |
| Chelsea—78, Church-st., u.t. 18 yrs., no g.r., r. £45 p.a.                                    | 260   |
| By BAKER & BONS.                                                                              |       |
| Isleworth—An enclosure of land, 5a. 3r. 14p., f., g.r. £15, r. £80 p.a.                       | 2,100 |
| New Southgate—1, 2, and 3, Oak-cottages, u.t. 79 yrs., g.r. £15, r. £80 p.a.                  | 140   |
| 1 to 4, Vine-cottages, u.t. 79 yrs., g.r. £14, r. £73 p.a.                                    | 200   |
| 1 to 10, My-pl., u.t. 53 yrs., g.r. £50, 10s., r. £123 p.a.                                   | 250   |
| By WARD & CLARKE.                                                                             |       |
| Willersden—19, Waldo-rd., f., r. £26 p.a.                                                     | 220   |
| 23 to 29 (odd), Waldo-rd., f., r. £130 p.a.                                                   | 195   |
| 39, 41, and 43, Waldo-rd., f., r. £78 p.a.                                                    | 210   |

[Contractions used in this list.—F.g.r. for freehold ground-rent; I.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; e. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

## MEETINGS.

SATURDAY, JUNE 8.

Association of Public Sanitary Inspectors.—Fourth Annual Provincial Meeting at Chelmsford, *Workmen's and Apprentices' Exhibition, People's Palace, Mile End.*—Opening by Lord Brassey. 4 p.m.

THURSDAY, JUNE 13.

Society for the Encouragement of the Fine Arts.—Morning meeting.

SATURDAY, JUNE 15.

Architectural Association.—Vacation Visit to Elizabethan mansion at Parham, Sussex (see adv.)  
Royal Institution.—Professor W. Knight on "Idealism and Experience in Art and Life." 3 p.m.

## Miscellaneous.

**The Association of Public Sanitary Inspectors of Great Britain.**—The fourth annual Provincial Meeting of this Association will be held at Chelmsford on this Saturday, the 8th inst. His Worship the Mayor of Chelmsford, Mr. Frederic Chancellor, F.R.I.B.A., will receive the members in the Corn Exchange at 10.30 a.m., and addresses are expected from Dr. Richardson, F.R.S., Dr. Alfred Carpenter, J.P., Mr. William J. Beadell, M.P., and other gentlemen. Dr. A. Downes will also make some remarks on "Sanitation in Chelmsford." After luncheon the members will inspect the new Union buildings, under the direction of the architect (His Worship the Mayor). The members will then visit the Baddow Water Tower, which will be described by the engineers (Mr. Councillor Whitmore and Mr. C. Pertwee). They will next proceed to the Chelmsford Sewage Farm, under the guidance of Mr. Alderman Durrant, Chairman of the Joint Sewage Committee, and Mr. C. Pertwee, the Borough Engineer. If time permits, a visit will also be made to the new waterworks.

**The Iron, Hardware, and Metal Trades' Pension Society.**—On the 29th ult. the subscribers and friends of this well-established and admirable institution met to celebrate their annual festival. For forty-six years this charity has been in existence, and through it no less a sum than 120,000*l.* has been contributed for charitable purposes. During last year alone 138 families have been assisted, all the recipients being over 60 years of age. In the majority of cases families who had at one time been in affluence, but who had been reduced by commercial losses, had been saved from the workhouse. The chairman on the occasion mentioned was Mr. John Aird, M.P., who contributed (personally and by collection) a hundred guineas to the funds. Many established and well-known members of the trade were present, and during the evening Mr. T. Hodges Papworth, the secretary, announced a subscription-list of 650*l.* There is however, it is stated, much real necessity for further support being given to the Society.

**Important Sale of Pictures.**—Messrs. Boussoit & Valadon send us a catalogue of pictures, the property of M. Secrétan of Paris, which are to be sold by auction in Paris at the end of June or beginning of July. This includes no less than thirty-one pictures by Meissonnier; four by Corot, six by Rousseau, nine by Troyon &c. The names of Decamps and Delacroix also figure pretty largely, but we imagine these are sketches rather than pictures; a great number of sketches by Decamps are going about, but the finished pictures are not numerous. There are other works by Diaz, Fortuny, Ingres, Isabey, Gerard Dow, Metsu, Millet &c.

**Main Drainage, St. Helens, Lancashire.**—At a meeting of the St. Helens Town Council, held on Wednesday last, it was decided to apply to the Local Government Board for leave to borrow the sum of 32,800*l.*, for the purpose of constructing a main intercepting sewer, tanks, &c., for the main drainage of the borough, in accordance with the scheme prepared by Mr. Geo. J. C. Broom, Assoc. M.Inst. C.E., F.G.S., the Borough Engineer.

**Builders' Ironmongery, Sanitary Fittings, &c.**—Messrs. Young & Marten, of Stratford, have sent us their "Tariff No. 11, June 1st, 1889," which is a useful and well-arranged priced catalogue of selections of stock articles used by builders. Although it is only an extract from their larger general catalogue, it will repay perusal.

**Workmen's and Apprentices' Exhibition at the People's Palace.**—The second Workmen's and Apprentices' Exhibition is to be opened at the People's Palace, Mile End, on this Saturday, the 8th inst., at 4 p.m., by Lord Brassey.

**New Swiss Patent Law.**—A new law relating to patents has just come into force in Switzerland, of which the following clauses are the most important:—*Section 2:* An invention is not considered new in Switzerland, when, on the patentee making the application, such invention is already sufficiently known to be executed by another expert. *Section 6:* The patent right remains in force for fifteen years, reckoned from the date of application. For the patent right 20 francs is first paid and an additional 20 francs for the first year; second year, 30 francs; third year, 40 francs; and a similar sum annually till the fifteenth year, when 150 francs have to be paid. *Section 7:* When the patentee effects an improvement on his invention the fee of 20 francs is not demanded. *Section 9:* The patent ceases: (1) When the patentee makes request to that effect in writing to the Patent Commission; (2) when the annual charge is not paid within three months after each year. *Section 10:* In the subjoined instances the patent right becomes void: (1) When it be shown that the invention is not a new one; (2) if it be shown that the patentee is not the inventor or the one responsible for the invention; (3) if any one has obtained a patent on an object which in the application has been given a different denomination than it ought to have, with the object of deceiving the public or of deteriorating the value of some other truly valuable invention; (4) if the drawing or description of the invention patented, deposited simultaneously with the application, is shown not to be sufficiently clear to be executed by an expert, or do not correspond with the model. *Section 17:* If the Patent Commission finds that the object in question cannot be patented for some reason or another, the applicant will, as soon as possible, receive the Commission's confidential reason for the refusal, when he may amend the invention.

**International Factory Law Conference.** As early as 1881 the Swiss Government issued an invitation to several European States to assemble in conference, in order to frame a common law respecting factory labour, but it would seem that at that time the subject was not ripe for discussion. Since then, however, a great deal of legislation in this direction has been effected in various countries, and in consequence the Swiss Government has issued a fresh invitation to all the States of Europe to send delegates to a Conference in Bern next September in order to discuss the following five points, viz. (1), prohibition of all Sunday labour in factories, works, mines, &c.; (2) fixing of a minimum age for children employed, and the curtailment of the hours of labour for young persons; (3) prohibition of employment of minors and women in all industries injurious to health; (4) curtailment of nightwork; (5) how the programme may best be carried into law. It is understood that most of the Governments of Europe have accepted the invitation.

**The Late Sir Charles Lanyon.**—At the ordinary Council meeting of the Royal Institute of the Architects of Ireland, held on Monday, June 3, Mr. T. Drew, Fellow, in the chair, the following resolution was passed unanimously:—"The Council desire, on behalf of the Fellows and Members of the Royal Institute of the Architects of Ireland, to place on record the feeling of regret which has been evoked by the announcement of the death at Belfast of Sir Charles Lanyon, J.P., D.L., F.R.I.B.A., R.H.A., and Fellow and a past President of this Institute, and connected with it from its foundation fifty years ago. It is felt that in the past half-century, Mr., and in more recent years Sir, Charles Lanyon, has filled a foremost place in the history of the profession in Ireland, and has upheld its character by the excellence of his works and by his high-minded and loyal support to his brethren in the architectural profession."

**The Crystal Palace.**—On Whit Monday, June 10, it will be thirty-five years since the Queen, speaking beneath the great arch of the centre transept, declared the Crystal Palace open, and expressed the hope that the enterprise would elevate and instruct as well as delight and amuse all classes of her subjects. In celebration of this anniversary an attractive programme for the holiday folk has been put forth.

**The Prince's Club, Knightsbridge.**—We are again obliged to hold over our description of this club.



**The Expansion of Timber.**—Some experiments on the expansion of timber, caused by the absorption of water, have recently been made by Professor De Volson Wood in the Department of Tests of the Stevens Institute of Technology (U.S.). The results were reported to the recent Convention of the American Society of Mechanical Engineers. Two specimens, each of pine, oak, and chestnut, each about 3 ft. long and 6 in. wide, and fairly well seasoned, were kept in a dry, warm room for about three weeks, and then immersed in water for thirty-seven days. From measurements made immediately before and after immersion the following percentages of longitudinal expansion were obtained:—Pine, 0.065; oak, 0.085; chestnut, 0.165. The percentages of expansion laterally were:—Pine, 2.6; oak, 3.6; chestnut, 3.65. Unfortunately the varieties of pine, oak, and chestnut experimented upon are not given.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                   |        | £. | s. | d. | £. | s. | d. |
|-------------------------------------------|--------|----|----|----|----|----|----|
| Greenheart, B.G.                          | ton    | 6  | 10 | 0  | 7  | 10 | 0  |
| Oak, E.I.                                 | load   | 11 | 0  | 0  | 15 | 0  | 0  |
| Sesqui, U.S.                              | load   | 0  | 3  | 0  | 3  | 0  | 0  |
| Ash, Canada, load                         |        | 3  | 10 | 0  | 6  | 0  | 0  |
| Birch                                     |        | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm                                       |        | 4  | 0  | 0  | 8  | 0  | 0  |
| Fr. Dantic, &c.                           |        | 2  | 10 | 0  | 4  | 10 | 0  |
| Oak                                       |        | 5  | 10 | 0  | 7  | 10 | 0  |
| Canada                                    |        | 3  | 10 | 0  | 10 | 0  | 0  |
| Pine, Canada red                          |        | 3  | 10 | 0  | 10 | 0  | 0  |
| Yellow                                    |        | 4  | 10 | 0  | 5  | 10 | 0  |
| Lath, Dantic                              | fathom | 4  | 10 | 0  | 5  | 10 | 0  |
| St. Petersburg                            |        | 5  | 0  | 0  | 8  | 10 | 0  |
| Waincoat, B.G.                            |        | 2  | 10 | 0  | 4  | 10 | 0  |
| Deals, Finland, 2nd and 1st, 100          |        | 9  | 10 | 0  | 11 | 0  | 0  |
| " 4th and 3rd                             |        | 8  | 0  | 0  | 9  | 0  | 0  |
| Riga                                      |        | 7  | 10 | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow                |        | 11 | 0  | 0  | 15 | 0  | 0  |
| " 2nd                                     |        | 10 | 0  | 0  | 11 | 0  | 0  |
| " white                                   |        | 7  | 10 | 0  | 10 | 10 | 0  |
| Sweden                                    |        | 8  | 0  | 0  | 16 | 0  | 0  |
| White Sea                                 |        | 9  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                         |        | 16 | 0  | 0  | 28 | 10 | 0  |
| " 2nd                                     |        | 11 | 0  | 0  | 17 | 10 | 0  |
| " 3rd, &c.                                |        | 8  | 0  | 0  | 10 | 10 | 0  |
| " Spruce, 1st                             |        | 10 | 0  | 0  | 11 | 0  | 0  |
| " 2nd and 3rd                             |        | 7  | 10 | 0  | 9  | 0  | 0  |
| New Brunswick, &c.                        |        | 6  | 15 | 0  | 8  | 15 | 0  |
| Butane, all kinds                         |        | 6  | 10 | 0  | 20 | 0  | 0  |
| Flooring Boards, 4x1 1/2, prepared, First |        | 0  | 11 | 0  | 0  | 14 | 6  |
| Second                                    |        | 0  | 8  | 0  | 0  | 10 | 9  |
| Other qualities                           |        | 0  | 6  | 0  | 7  | 0  | 0  |
| Cedar, Cuba                               | foot   | 0  | 0  | 44 | 0  | 0  | 44 |
| Honduras, &c.                             |        | 0  | 0  | 4  | 0  | 0  | 44 |
| Mahogany, Cuba                            |        | 0  | 0  | 44 | 0  | 0  | 64 |
| St. Domingo, cargo average                |        | 0  | 0  | 44 | 0  | 0  | 64 |
| Mexican                                   |        | 0  | 0  | 44 | 0  | 0  | 64 |
| Tobacco                                   |        | 0  | 0  | 54 | 0  | 0  | 64 |
| Honduras                                  |        | 0  | 0  | 54 | 0  | 0  | 64 |
| Box, Turkey                               |        | 4  | 0  | 12 | 0  | 0  | 0  |
| Rose, Rio                                 |        | 15 | 0  | 0  | 20 | 0  | 0  |
| Bahia                                     |        | 14 | 0  | 0  | 18 | 0  | 0  |
| Sale, St. Domingo                         | foot   | 0  | 0  | 6  | 1  | 0  | 0  |
| Porto Rico                                |        | 0  | 0  | 4  | 0  | 0  | 0  |
| Walnut, Italian                           |        | 0  | 0  | 2  | 0  | 0  | 64 |

| METALS.                      |     | £. | s. | d. | £. | s. | d. |
|------------------------------|-----|----|----|----|----|----|----|
| IRON—Bar, Welsh, in London   | ton | 5  | 5  | 0  | 5  | 10 | 6  |
| " " at works, Wales          |     | 4  | 15 | 0  | 5  | 0  | 0  |
| " " Staffordshire, in London |     | 5  | 10 | 0  | 6  | 0  | 0  |
| COPPER—                      |     |    |    |    |    |    |    |
| British, cake and ingot      | ton | 45 | 0  | 0  | 43 | 0  | 0  |
| Best selected                |     | 47 | 0  | 0  | 47 | 10 | 0  |
| Rheto, strong                |     | 62 | 0  | 0  | 33 | 0  | 0  |
| Ohili, bars                  |     | 61 | 15 | 0  | 0  | 0  | 0  |
| YELLOW METAL—                |     |    |    |    |    |    |    |
| Yellow Metal, 10 lb.         |     | 0  | 0  | 6  | 0  | 0  | 64 |
| Lead—Sheet, English          | ton | 13 | 10 | 0  | 14 | 0  | 0  |
| SPRINT—                      |     |    |    |    |    |    |    |
| Silesian, special            | ton | 18 | 2  | 0  | 0  | 0  | 0  |
| Ordinary brands              |     | 18 | 0  | 0  | 0  | 0  | 0  |
| Tin—                         |     |    |    |    |    |    |    |
| Straits                      | ton | 91 | 0  | 0  | 0  | 0  | 0  |
| Australian                   |     | 61 | 10 | 0  | 0  | 0  | 0  |
| English ingots               |     | 95 | 0  | 0  | 0  | 0  | 0  |
| Zinc—English sheet           | ton | 21 | 0  | 0  | 22 | 0  | 0  |

| OILS.                  |     | £. | s. | d. | £. | s. | d. |
|------------------------|-----|----|----|----|----|----|----|
| Linseed                | ton | 20 | 2  | 0  | 20 | 5  | 0  |
| Cocanut, Coochin       |     | 28 | 10 | 0  | 23 | 0  | 0  |
| Ceylon                 |     | 24 | 10 | 0  | 24 | 15 | 0  |
| Palm, Lagos            |     | 24 | 0  | 0  | 25 | 0  | 0  |
| Rapeseed, English pale |     | 27 | 10 | 0  | 28 | 0  | 0  |
| " brown                |     | 28 | 0  | 0  | 28 | 10 | 0  |
| Cottonseed, refined    |     | 25 | 10 | 0  | 28 | 15 | 0  |
| Tallow and Oleine      |     | 19 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S.      |     | 5  | 0  | 0  | 6  | 0  | 0  |
| " refined              |     | 7  | 0  | 0  | 12 | 0  | 0  |
| Tar—Baltic             |     | 1  | 3  | 0  | 3  | 6  | 0  |
| Archangel              |     | 0  | 15 | 9  | 0  | 18 | 0  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**ASHTON-UNDER-LYNE.**—For the extension of Trafalgar day-schools. Mr. J. H. Burton, architect, Warrington-street, Ashton-under-Lyne.

J. W. Williamson, Ashton-under-Lyne..... £860 0 0

Lyne..... 650 0 0

Jabez Gibson, Dunkinfield..... 650 0 0

Allen Holmes, Ashton-under-Lyne..... 590 0 0

John Robinson, Ashton-under-Lyne\* 590 0 0

\* Accepted.

**CLEVEDON (Somerset).**—For sanitary repairs and alterations at three residence villas. Messrs. James Hoddell & Co., architects, Clevedon:—

T. Hill..... £142 0 0

Harry Elton..... 135 0 0

Harbridge & Turner (accepted)..... 150 0 0

## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.          | By whom Required.                      | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------|----------------------------------------|-----------------------------------|--------------------------|-------|
| Bar Paving                             | Willenden Local Board                  | O. Claude Robson                  | June 11th                | ii.   |
| Brick-lined Concrete, &c., Pipe Sewers | West Ham Council                       | L. Angell                         | do.                      | ii.   |
| Guernsey Granite                       | Brentford Union                        | Official                          | do.                      | x.    |
| Firewood                               | do.                                    | do.                               | do.                      | x.    |
| Drainage Works                         | Central London Dist. School, Haswell   | do.                               | do.                      | ii.   |
| Earthenware Sewer Pipes                | Belfast Corporation                    | J. C. Brodland                    | do.                      | x.    |
| Street Improvements                    | Chestnut Local Board                   | T. Bennett                        | do.                      | ii.   |
| Blue Guernsey Granite Spalls           | West Ham Union                         | Official                          | June 12th                | ii.   |
| Sewerage Works                         | Sereosaks R.S.A.                       | T. Hennell                        | June 18th                | ii.   |
| Cast-iron Pipes, &c.                   | Southampton Corp.                      | W. Matthews                       | do.                      | x.    |
| Enlargement of Post Office, Wallall    | Com. of H.M. Works                     | Official                          | do.                      | ii.   |
| Asphalting and Tarpaving Works         | Tottenham Local Board                  | J. E. Worth                       | do.                      | x.    |
| Wood Paving and Asphalt Paving         | St. Margaret, &c. (Westminster) Vestry | G. R. W. Wheeler                  | June 18th                | ii.   |
| Roads and Drains                       | Not stated                             | T. Thompson                       | June 20th                | x.    |
| Painting, &c.                          | Met. Asylums Board                     | Official                          | do.                      | x.    |
| Swimming Bath, &c.                     | St. John's, Hampstead                  | Mr. Spalding                      | June 21st                | x.    |
| Widening Bridge                        | Cumberland Coun. Co.                   | Official                          | June 22nd                | x.    |
| Broken Granite                         | Newmarket Local Board                  | do.                               | do.                      | ii.   |
| Erection of Board School               | Reading School Board                   | S. S. Stallwood                   | June 24th                | x.    |
| Engine and Boiler House, &c.           | Borough of West Ham                    | L. Angell                         | June 25th                | x.    |
| Tinny Groyes on San Front              | Level of Romney Marsh                  | H. D. Good                        | June 27th                | x.    |
| New Outlet Sluice, Watercourse, &c.    | Havering & Daguenham Com. of Sewers    | J. Hickman Barnes                 | July 1st                 | x.    |
| Painting, Repairs, &c.                 | Central London Sick Asylum District    | Official                          | do.                      | x.    |
| New Municipal Offices                  | York Corporation                       | W. Powell                         | July 2nd                 | ii.   |
| Yorkshire Flagging                     | Croydon Corporation                    | Official                          | Not stated.              | ii.   |
| Painting, &c., Works, Gosport          | War Department                         | do.                               | do.                      | ii.   |
| Painting, &c., Works, Gosport          | do.                                    | do.                               | do.                      | ii.   |
| Alteration to Bar, &c.                 | Not stated                             | do.                               | do.                      | x.    |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.                       | By whom Advertised.    | Salary.      | Applications to be in. | Page. |
|----------------------------------------------|------------------------|--------------|------------------------|-------|
| Waste-water Inspector and Turncock           | Ely Local Board        | Not stated   | June 10th              | xvi.  |
| Temporary Assist. in Boro' Surveyor's Office | Walsall Corporation    | 21. per week | June 14th              | xvi.  |
| Surveyor and Engineer                        | Sutton Coldfield Corp. | 200.         | June 20th              | xvi.  |
| Surveyor of Highways                         | Mortlake Highway Bd.   | 1800.        | June 22nd              | xvi.  |

**HAMPTON WICK.**—For constructing the Hampton Wick Sewerage Works, on the Shorne hydro-pneumatic system. Mr. R. T. Eismar, Surveyor, Local Board Office, Hampton Wick. Mr. Isaac Shone, Consulting Engineer, Westminster. Quantities for No. 4 Contract by the Surveyor:—

| Contract No. 1.                       | Contract No. 2. | Contract No. 3. | Contract No. 4. |
|---------------------------------------|-----------------|-----------------|-----------------|
| Chas. Dickenson, Mortlake             |                 |                 | 23,790 0 0      |
| Botterill, Cannon-street, E.C.        |                 |                 | 8,708 0 0       |
| A. Kellist, Ratford                   | 2877 2 6        |                 | 8,157 17 10     |
| L. Bottoms, Wyndworth-common          |                 |                 | 7,847 6 10      |
| J. W. & J. Neave, Leytonstone         | 1,190 10 0      |                 | 7,450 0 0       |
| W. Carter, Anerley-road               |                 |                 | 7,258 19 0      |
| W. Gibson, Exeter                     |                 |                 | 6,820 0 0       |
| H. Hill, Maidenhead                   | 828 10 0        |                 | 6,722 0 0       |
| E. & W. Iles, South Wimbledon         |                 |                 | 6,713 0 0       |
| J. Filler, Teddington                 |                 |                 | 6,620 0 0       |
| Park & Handal, Woolwich               | 859 0 0         |                 | 6,474 0 0       |
| W. Cunliffe, Dorking                  | 695 0 0         |                 | 5,978 0 0       |
| James Armer, 52, Cannon-street        |                 | 1,050 0 0       |                 |
| Manlove, Allott, & Co., Nottingham    |                 | 798 0 0         |                 |
| T. Atkinson & Co., Gospel Oak, London |                 | 748 0 0         |                 |
| Crosley Bros., Manchester             |                 | 692 0 0         |                 |
| Hughes & Lancaster, Chester           | 1,014 1 3       | 784 9 0         |                 |

\* Accepted.

**CRICKLEWOOD.**—For building house in the Edgware-road, Cricklewood, N.W., for Miss Marston. Mr. Geo. S. Finlay, architect:—

|                 |            |
|-----------------|------------|
| Tennant & Co.   | 22,498 0 0 |
| Woodward & Co.  | 2,489 0 0  |
| H. & E. Lea     | 2,487 0 0  |
| Higgs & Hill    | 2,434 0 0  |
| Bywaters        | 2,483 0 0  |
| Freestone & Co. | 2,359 0 0  |

**CROYDON.**—For the erection of two villa residences, Campden-road, for Mr. J. Kendall. Mr. E. C. Homer, architect, 99, Gresham-street, E.C.:—

|                      |            |
|----------------------|------------|
| H. Weaver (accepted) | 22,167 0 0 |
|----------------------|------------|

**GILLINGHAM (Kent).**—For erecting the nave, aisles, narthex, and west porches of St. Barnabas' Church. Messrs. J. E. K. and J. P. Cutts, architects:—

|                                   |            |
|-----------------------------------|------------|
| J. Tyerman, London                | 23,119 0 0 |
| W. C. Snow, New Brompton          | 2,920 0 0  |
| Bunning & Son, London             | 2,926 0 0  |
| Walls & Sons, Maidstone           | 2,839 0 0  |
| Naylor & Son, Rochester           | 2,889 0 0  |
| C. E. Skinner, Chatham (accepted) | 2,550 0 0  |

**HILDENBOROUGH.**—For erecting farm buildings and cottage at Hone Lodge, Hildenborough, Kent, for Lord Arthur Cecil. Mr. G. St. Pierre Harris, architect, 8, Bedford-street. Quantities by Messrs. C. Stanger & Son, surveyors, 21, Finsbury-pavement, E.C.:—

|                           |            |
|---------------------------|------------|
| S. J. Jerrard, Lewisham   | 28,882 0 0 |
| W. & F. Croaker, London   | 8,738 0 0  |
| T. Olver, Chislehurst     | 8,719 0 0  |
| Somerford & Son, Clapham  | 8,480 0 0  |
| W. Holt, Croydon          | 8,300 0 0  |
| W. Whitshire, Sevenoaks   | 8,000 0 0  |
| R. Durrant, Brixton       | 7,877 0 0  |
| T. Gregory & Co., Clapham | 7,677 0 0  |

**HINCKLEY.**—For painting and decoration in sitting and bedrooms at Higham Grange, for the Hon. E. H. Pierpont:—

|                              |         |
|------------------------------|---------|
| C. Handley & Sons (accepted) | 230 0 0 |
|------------------------------|---------|

**ILFORD.**—For the erection of three shops in the Broadway, Ilford, for Mr. A. North. Mr. P. Watkins, architect:—

|                              |            |
|------------------------------|------------|
| Walters, Barkingside         | 21,350 0 0 |
| North Bros., Stratford       | 15,722 0 0 |
| W. Watson, Ilford (accepted) | 1,187 0 0  |

**LONDON.**—For additions and alterations to the Union Workhouse, Poplar, for the Guardians. Messrs. W. A. Hills & Son, 149, Bow-road, E. architects. Quantities supplied by Mr. H. Poston, 39, Lombard-street, E.C.:—

|                                |             |
|--------------------------------|-------------|
| Brass & Sons                   | £26,500 0 0 |
| J. T. Chappell                 | 24,900 0 0  |
| Allen & Sons                   | 24,870 0 0  |
| M. Gentry                      | 24,150 0 0  |
| Perry & Co.                    | 23,880 0 0  |
| Kirk & Randall                 | 23,877 0 0  |
| W. Shurman, Clapton (accepted) | 23,679 0 0  |

**LONDON.**—For alterations to the "Enterprise" public-house, Walton-street, Chelsea, for Mr. J. F. Richter. Mr. T. H. Smith, architect, 17 and 18, Basinghall-street, E.C.:—

|                        |          |
|------------------------|----------|
| Hammond                | £298 0 0 |
| Turtie & Appleton      | 245 0 0  |
| W. H. Smith (accepted) | 205 15 0 |

**LONDON.**—For repairs and alterations at "Claremont," Enmore-park, South Norwood, for Mr. W. H. Withall, under the superintendence of Mr. Paracott, surveyor, 156, Westminster Bridge-road:—

|               |           |
|---------------|-----------|
| Reed          | £208 18 4 |
| Peacock Bros. | 201 10 0  |

**LONDON.**—For alterations, repairs, &c., at 41, Harleyford-road, Kennington. Mr. Wm. West, architect and surveyor, 19, Craven-street, Strand:—

|                          |          |
|--------------------------|----------|
| Wm. Smith                | £630 0 0 |
| J. & H. Coles            | 630 0 0  |
| Manley & Son             | 627 0 0  |
| Spencer & Co. (accepted) | 590 0 0  |

LONDON.—For rebuilding No. 131, Finabury-pavement, for Messrs. Warner Bros. Mr. E. H. Smith, architect, 17 and 19, Basinghall-street, E.C.:—  
Allen & Sons (accepted) £2,424 0 0

LONDON.—For part rebuilding No. 11, Little St. Andrew's-street, St. Martin's-lane, W.C. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C.:—

|          |          |
|----------|----------|
| Watson   | £465 0 0 |
| Longland | 437 0 0  |
| Croft    | 353 0 0  |
| Hood     | 381 0 0  |
| Marston  | 369 0 0  |

LONDON.—For alterations to 7, New Basinghall-street, E.C. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C.:—

|                        |          |
|------------------------|----------|
| Watson                 | £380 0 0 |
| Croft                  | 325 0 0  |
| Bishop Bros. & Marston | 229 0 0  |
| Lascelles              | 277 10 0 |
| Hood                   | 225 0 0  |

LONDON.—For alterations, &c., at the "Garrick," Leman-street, Whitechapel. Mr. Wm. West, architect and surveyor, 19, Craven-street, Strand:—

|                |          |
|----------------|----------|
| J. Beale       | £490 0 0 |
| Drew & Cushman | 449 0 0  |

LONDON.—For the erection of warehouse in Banner-street, St. Luke's, for Messrs. Maxwell & Son. Mr. C. H. Flack, architect. Quantities by Mr. H. R. Messinger:—

|                       |            |
|-----------------------|------------|
| Fatman & Fotheringham | £2,529 0 0 |
| Newton                | 2,453 0 0  |
| J. M. rter            | 2,454 0 0  |
| W. Downes             | 2,430 0 0  |
| Balsam Bros.          | 2,393 0 0  |
| Barton & Co.          | 2,385 0 0  |
| Sawyer                | 2,353 0 0  |

LOUGHBOROUGH.—For alterations at West Leake House, Loughborough, for the Dowager Lady Belper. Mr. Henry Hall, architect, 19, Doughty-street, London, W.C.:—  
Walker & Slater, Derby (accepted) £285 0 0  
[No competition.]

MARDEN PARK (Surrey).—For the erection of a residence on the Marden Park Estate, for Mr. G. H. Stupart. Mr. Frederick Rogers, architect. Quantities by Mr. Fred. Cartwright, 89, Chancery-lane, W.C.:—

|                           |          |
|---------------------------|----------|
| Cloke & Winkle, Westerham | £688 0 0 |
| Maudes & Harper, Croydon  | 687 0 0  |
| W. A. Grubb, Bromley      | 673 0 0  |
| E. Byes, Bromley          | 669 0 0  |
| J. & J. Ward, Warrington  | 643 0 0  |
| J. Brasier, Oxford        | 627 0 0  |

RICHMOND.—For alterations and additions at the Richmond Union Workhouse. Mr. E. Maynard, architect, College-chambers, Richmond:—

|                 |            |
|-----------------|------------|
| Lansdown & Co.  | £1,129 0 0 |
| Sweet & Loder   | 1,045 0 0  |
| Scharien & Co.  | 1,028 0 0  |
| Carman          | 985 0 0    |
| Collinson       | 965 0 0    |
| Lillywhite      | 965 0 0    |
| Hunt (accepted) | 857 0 0    |

SYDENHAM.—For rebuilding the "Fox and Hounds" public-house, High-street, Sydenham, for Mr. E. W. White. Mr. T. H. Smith, architect, 17 and 19, Basinghall-street, E.C. Quantities by B. G. Thompson:—

|                      |            |
|----------------------|------------|
| Radman               | £3,849 0 0 |
| Kennard              | 3,750 0 0  |
| Burman & Sons        | 3,730 0 0  |
| Smith & Sons         | 3,565 0 0  |
| Spencer & Co.        | 3,540 0 0  |
| Turtill & Appleton   | 3,470 0 0  |
| Waddington & Co.     | 3,470 0 0  |
| Holliday & Greenwood | 3,450 0 0  |
| Tarrant              | 3,448 0 0  |
| Allen & Sons         | 3,356 0 0  |

WEST KIRBY.—For erecting Wesleyan schools and class-rooms at West Kirby. Mr. John Wills, architect, Derby:—  
W. Christian, West Kirby (accepted) £916 0 0

WARLINGHAM.—For bungalow residence, Warlingham, for Mr. Worthington Church. Mr. Ernest H. Abbott, architect, 6, Warwick-court, Holborn. Quantities by Mr. A. Johnson:—

|                    |            |
|--------------------|------------|
| F. & H. F. Higgs   | £1,460 0 0 |
| Hunter & Bryant    | 1,400 0 0  |
| J. Churchill       | 1,398 0 0  |
| J. & J. Ward       | 1,330 0 0  |
| C. E. Scrivenor    | 1,269 0 0  |
| C. Oldridge & Sons | 1,244 0 0  |

WARLINGHAM.—For bungalow residence, Warlingham, for Mr. Worthington Church. Mr. Ernest H. Abbott, architect, 6, Warwick-court, Holborn. Quantities by Mr. A. Johnson:—

|                    |            |
|--------------------|------------|
| C. E. Scrivenor    | £1,650 0 0 |
| F. & H. F. Higgs   | 1,590 0 0  |
| Hunter & Bryant    | 1,681 0 0  |
| J. & J. Ward       | 1,472 0 0  |
| C. Oldridge & Sons | 1,424 0 0  |

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# The Builder.

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### The Municipal Pavilions at the Paris Exhibition.



S we have mentioned in a previous article, there are at the Paris Exhibition two special pavilions, standing in front of the main dome at each side of the central axis of the Champ de Mars, which are

devoted to illustration of the work of the municipal administration of Paris. To architectural visitors there will be no section of the exhibition more interesting than this, as it brings together illustrations of the whole matériel and method of conducting and maintaining public works in Paris, as well as a good many examples of what may be called official art and architecture.

Commencing with the eastward of the two pavilions, the right-hand one as we look up the Champs de Mars in the direction of the Trocadéro, it may be said that in the sultry weather of Saturday last the most popular exhibit in the whole pavilion was the pretty bronze fountain near the entrance, the upper portion of which forms a small alcove or cupola with open arches at the sides and supported by figures on the piers, from the centre of the roof of which descends a thin stream of deliciously cool and clear water, the musical ring of which in the thin metal cups supplied for drinkers was heard without cessation the whole afternoon. Immediately in front of this, the next thing on the centre line of the gallery is the exhibit which gives the special point and meaning to the one just named. This consists of a triple glass tank containing the waters of the Ourcq, the Vanne, and the Seine in their unsophisticated state; the Ourcq and Seine waters showing a turbid brown, the Vanne a turbid white. The Municipality could not have put forward a better argument in support of their water supply. If they are able, out of the natural sources here indicated, to supply such a cup of cold water as is placed at the entry of their gallery, they may defy criticism as to the treatment and quality of their water supply, even if there may be, as has been said, some deficiency in regard to its quantity at some seasons of the year.

Water-supply and dealing with rivers

occupy considerable space on this part of the floor. There are two or three large models of mills (*usines*) for raising water to the levels required for circulation; and there is a plan and model of the first reservoir in connexion with the Vanne water, where the water is led off from the stream into a large circular reservoir forming a green-covered knoll externally, whence the aqueducts branch for the conveyance of the water. There is also a large and interesting model, partly shown in section, of the Montmartre reservoir. This, in the highest portion, is in four stories, of which the two middle ones, consisting of a series of vaults on massive square columns, appear to be for the water storage; the outer containing walls are very thick, and battered, and the arches contiguous to the boundary walls act practically as internal buttresses. Above these vaulted halls is an upper story of vaults of lighter construction, supporting the finished ground surface, which is grassed over as a lawn and surrounded by a balustrade: this story also acts as a screen from the heat for the water reservoir below. At the bottom of the whole construction is a series of smaller arched passages, in which are placed the conduit-pipes for the water. Sections of the iron-pipes used for the water service are placed upright in a row not far from here, in sizes ranging from over a metre to a few inches in diameter. Models of two or three recent bridges are shown,—the Pont de la Grande Jatte and the Pont de Suresnes, both on the system of elliptical arched iron cantilever girders and masonry piers with rounded bastion-shaped buttresses; there is also a working model of a small lifting bridge carrying the Rue de Grinée over the Bassin de la Villette, a bridge operated by hydraulic presses under control of an operator within the bridge-house, hauling on chains passing over large pulley-wheels supported on cast-iron columns at each side of the bridge end, and pulling with a straight vertical lift. The model, at all events, acts speedily and effectually.

Returning to the entrance of the pavilion, we find at the left hand the large erection representing a "maison insalubre," having ascended the three stories of which we cross by a gallery over the entrance to the upper story of the "maison salubre," and descend through that to the exit. This is, of course, the same kind of thing that was seen in London at the "Healtheries;" the models here are perhaps finished more carefully and in more detail, and both on the sanitary and insanitary side

there are details which are of interest to an English visitor as presenting local peculiarities both of sanitation and of insanitation. In the "maison insalubre" stress is laid on the unwholesomeness of standing pails for "slops" under sinks and lavatories, which in the sanitary house are shown drained by permanent waste-pipes, with S-bends under them,—the S-bend is universal in French sanitation, and particular attention is drawn to its necessity. The evil of angular jointing is also emphasised, and in the sanitary house longitudinal sections of pipe junctions are shown to illustrate the true way of turning the channel of a branch pipe into the main. In the small internal yard of the "Insalubre" is an antediluvian ventilator,—a large square wooden tube going up the side of the house, and ending just under the eaves. But the pride of the French "maison insalubre" lies in its cesspool under part of the internal yard surface, an apartment shaped somewhat like a bottle, arched over at the top, and with a neck left in the centre of the vault, the top of which is covered by a flagstone by no means air-tight. In the model the covering stone is off, and a dilapidated looking metal pipe emerges from the cavern, connected to a pump-looking engine standing by the side of the opening. The sectional drawings of the methods employed at various dates for "vidanges" or emptyings, which are to be seen on the screen opposite the entrance door of the "maison insalubre," throw a lurid light on the meaning of this piece of mechanism, which was a pump for pumping the contents of the cesspool in a pipe, and through another pipe discharging them into a barrel, either on wheels or not, for removal—where, we are not told. The study of these drawings causes a shudder in the sanitarian frame. They are labelled "Vidanges des fosses fixes." Under date 1668 we see the most primitive method of "enlèvement des solides à la hotte," a man down in the "fosse" digging up the deposit into a small tub, to be hauled up in successive loads, and the "enlèvement des liquides à la seaue," a similar system of sending down a bucket at the end of a cord; and this almost within the precincts of the habitation. In 1786 was introduced the "système Giraud," by which the soil was sent into a large wooden vat standing in the fosse, on bearers, and connected below by a pipe to a smaller "portatif" vat for removal: this was evidently supposed to keep the nuisance of removal more in hand. In 1788 an ingenious M. Gourlier invented a "système diviseur,"



by which a dwarf wall was built across the bottom of the fosse, making a partition, in which the solids gradually filled up the space and the liquids overflowed the edge of the wall into the other compartment. On the whole, a contemplation of this historic series of "vidange" operations makes one wonder that any Parisians were left to tell the tale; but former generations must unquestionably have been less susceptible than we are now, or how could they have either lived or endured life?

In the large coloured sections hung on the wall in further illustration of sanitation, the "Syphon D" is duly gibbeted, and the "insalubre" section gives a graphic portrayal of the old condition of water-supply, and the sewage permeating from the cesspool into the well. In the similar-coloured section of the "maison salubre" there are more plugged-up inspection-pipes on the drains under the house than we should consider desirable, and the intercepting chamber is very small to English eyes; little more than a man-hole. Returning to the building showing the "maison salubre," we may notice that there are three different forms of water-closet shown, that on the top floor being a cased-up water-closet with a lead safe under, according to a system now pretty nearly exploded in England. The next floor shows a closet with a pedestal basin standing free, and on the second floor is an example of the French approved form of closet for the dependants or lower orders of the house. This is a closet with a very low seat (why so low we do not understand,—it is only about 10 in. high) built up of glazed stoneware, and round it is a sloping skirting of solid cement, about 2 ft. high, sloping back all round from the seat to the wall plane. The whole object of this is of course to make something of which every part should be thoroughly washable, and it may no doubt be a very good practice for places where a low order of persons are to use it, who will make no effort after cleanliness or propriety,—for jails or workhouses, for instance; but if the introduction of a "closet commun" of this class is considered desirable as a servants' closet in a French dwelling-house (as the model here would imply), the fact would form a rather severe reflection on the manners and habits of French servants; and we should rather conclude that it is introduced here from the wish to show as many forms of closet as could be got in. A great point is made in the "maison salubre" of hard material generally, as against the lath-and-plaster material which is found in some portions of the "maison insalubre"; as also of the conduction of all products of gas-burners to the outside of the structure, which is provided for by ventilating gas-brackets of a very tawdry ornamental description. The inlet ventilators, with mica valves, would be considered very insufficient in area with us, and moreover the mica flap valve is an institution which is rather theoretic than practical in its action. There is no systematic provision for admitting warmed air; there is a fireplace with an inlet of air shown at the side, a little way above the line of grate, but this is described as mainly for the purpose of affording ample supply of air for combustion. For this purpose it ought to be lower down; but to bring in a special supply of air for combustion direct to the fire from outside the wall is of course to prevent the fire performing the function which it otherwise is so useful in, that of creating a current of aspiration and keeping the air of the room in a state of flow. Again, in the coloured drawings of the "maison salubre" the soil-pipe ventilator is shown not standing straight up above the roof, but carried up the slope of the roof and then turned upright against a chimney stack and discharging nearly on a level with the chimneys. Here, then, is the double disadvantage of having two bends in the pipe, one at the eaves and another at the chimney, and of having the pipe discharging close to the top of the chimneys. There are such things as down-draughts in chimneys. From this and one or two other points we conclude that while the sanitary and insanitary houses are admirably and clearly got up, the true principles

of house sanitation have not, in some points, been as thoroughly grasped in France as in England.

Outside of the sanitary house is an exposed section of a Paris sewer (of the 12 bis. type), showing the arrangement of a large oval-section sewer with a small invert formed in cement, and a continuous passage-way alongside of it wide enough for a man to walk with ease; above his head are the gas and water-pipes on bearers. The house-drain connections are made on the passage side, by small inverts left or excavated in the passage-way, and covered with a flush grating. This admirable arrangement of the Paris subterranean service, costly at the commencement, no doubt, but saving an immense amount of cost and inconvenience in taking up the streets subsequently, has been often described and commented on, but those who have not before seen it should not pass over this sectional full-size model. A large number of small-size concrete models of sewers and sewer-cleansing apparatus were also just getting completed in this portion of the room, including a very complete model of the apparatus used for cleansing the inverts of the large sewers from deposit of solid matter. This, as some of our readers are aware, consists of a flat-bottomed boat floating on the sewage current and pushing before it a large template on strong bearers with the lower edge cut to the section of the invert; this is supposed to push the deposit before it till it accumulates so far as to be raked out with hooked rakes made for the purpose. The boat is kept straight by a kind of mechanical steering apparatus, consisting of steel rods extending right and left horizontally from what would in an ordinary boat be the rudder head, and carrying at the extremities brass wheels or castors working horizontally against the sides of the invert, just below the foot walk. All this seems very ingenious and complete in a model, but whether such a scheme of cleansing is efficient in proportion to the cost and elaboration of the means employed we should think very doubtful.

In connexion with the water service, we noticed also a contrivance for forming a temporary dry-dock (bache mobile) for repairing the banks of the open aqueducts or canals, consisting of an iron caisson laid down parallel with the bank at a few feet distance, and the space filled up at the ends with double sheet piling filled in with concrete, sufficient waterway being left outside the caisson in the centre of the aqueduct.

In a side chapel, as it may be called, further on, are collected maps and views of Paris at different dates (not very numerous, one must admit), examples of old MS. documents of various dates, old official seals, and a good many photographs of arrow-heads and other objects, illustrative of the Seine "aux ages préhistoriques."

This part of the collection, however, can be hardly said to amount to more than an indication that the past history of the site of Paris has not been entirely overlooked; and we soon come again to modern practical work in the next bay, where the most conspicuous object is an admirably-arranged collection of the stones used in Paris roads and foot-walks, "matériaux de pavage," illuminated by small cubes of each material (many scores of them), with the name, place, and "coefficient d'usure" labelled on each. Near this case of specimens are models of two machines for testing resistance to abrasure, whereby these "coefficients d'usure" are obtained. The one consists of a double cylinder placed on an axis inclined at an angle to the horizontal; in one of these are placed pieces of a hard porphyry, which is taken as normal, in the other an equal weight of stones of about equal average size of the material to be tested—after a certain number of rapid revolutions of the cylinders, the detritus in each cylinder is weighed and compared with the original weight of the material put in, and the coefficient of "usure" arrived at from these data.\* Another

\* Two of the trays of specimens have been wrongly labelled, those marked as "after testing" should be before, and vice versa.

apparatus for testing resistance to wear is shown, in which two cubes, one "normal" and the other of the material to be tested, are placed in holders with a calculated pressure put on to them by weighted levers which press on the upper side of the specimen, while the lower side is exposed to wear by the action of the periphery of a horizontal metal disc on opposite sides of which the two specimens are pressed by the levers above. This seems by far the most scientific and manageable of the two forms of test exhibited.

The lower end of this pavilion is occupied by an exceedingly interesting collection of examples of the artistic and architectural work of the municipality. First we have a collection of cartoons of paintings prepared for the decorative treatment of the walls and ceilings of various Mairies. These are not all in the highest style of art, certainly, and some of them are not sufficiently decorative in character; but considering how little attempt even is made at this kind of artistic embellishment of local municipal buildings in England, it would ill become us to be too critical. The large painting by M. Glaize, evidently a wall-painting for a Salle des Mariages, is really a fine thing; it represents a young man seated before the Temple of Hymen, the bride conducted to him by the Graces and a fluttering crowd of amorini; below are three fine seated figures of the Fates, in dark drapery, two of them engaged in spinning out the web of life; but Atropos, the third, has fallen asleep and dropped her shears, as on an occasion when the end of life is the very last thing to be thought of: a pretty bit of allegory. Two large paintings of Summer and Autumn, by M. Séon, are evidently intended as two halves of a ceiling, and are suitable for that position, in their light, "Chavannist" tone of colouring, though the architectural pilaster borders are too heavy and out of place on a ceiling; unless indeed these are intended for two semi-domes and not for a *plafond*: in that case the treatment would do well enough. M. Paul Baudouin's two paintings, apparently also intended for a Salle des Mariages, are too realistic in style, and rather absurdly practical in conception; they seem to represent Courtship and Matrimony; in the former a young man seated lazily on a horse standing in the middle of a stream keeps up a conversation with a girl on the bank; in the other one we are at a great washing-day "function," and the husband is wheeling away a barrow full of the clothes. There is something far more laughable than moral in this prosaic interpretation of the duties of a helpmate. M. Commère's four paintings of the four seasons are in a much more poetic vein than this, but too pictorial in style for wall decorations.

At the lower end of the pavilion we come on the illustrations of the architectural work of the Municipality, and this is a most interesting collection to the English architectural visitor, who, whether or not he admires the style of the buildings, must certainly be struck with the manner in which architectural work is illustrated; the large scale and fine style of the drawings, and the prevalence of large and elaborate models, a form of architectural illustration hardly used in England. The first exhibit seen is the only just completed model (to which the finishing touches were being put at the time these notes were made) of the building for the Musée Galliera, designed by M. Ginain. This is a square Classic building of one story, with an order of Corinthian columns with the flutings intercepted by what may be described as an annular rustication; the spandrels of the arches between the orders are very gracefully and effectively decorated with carvings of palm-leaves and garlands in low relief. Within the room devoted to architecture we find very large plans, and a still larger model of the great assemblage of buildings, consisting of two blocks on either side of the Rue de l'École de Médecine, designed by the same architect for the Faculté de Médecine. Great part of this is very plain in its architectural ordonnance; but the Cour d'Honneur,



with its screen of two double colonnades towards the street, and the order carried round the court-yard, is very dignified in effect; and the front towards the Boulevard St. Germain, with its Ionic order in the upper story, with colonnettes on screens between, and the broad solid treatment of the ground-story, is an admirable bit of adaptation of Classic elements.\* On the other side of the room is a set of very large geometrical drawings, and a great plaster model, of the new Sorbonne buildings, designed by M. Nenot; also Classic, somewhat richer than, but not nearly so refined in detail as the building for the Faculté de Médecine. Among other buildings illustrated by drawings or models or both are the new buildings for the Garde Républicaine (illustrated in the *Builder* for July 7, 1888); the enlargement of the École de Droit, a building showing very original adaptation of classical features; M. Hénard's "Casernes de Port Royal," with an effective central tower of what may be called "classic castellated" type; the drawings for the new Mairies of the Thirteenth, Fourteenth, and Eighteenth Arrondissements; M. Moreau's elaborate series of drawings for a public abattoir; the model and bird's-eye perspective view of M. Roussis's "Casernes de Sapeurs-Pompiers" (which rather reminds us of one or two of the larger London fire-brigade stations); and the elevations of "École de Garçons" in Avenue Duquesne, showing a certain amount of effect obtained, in a very plain building, by the grouping of the windows and the introduction at intervals of panels of brickwork and coloured terra-cotta amid the plain spaces of white stonework. Altogether the architectural exhibits in this pavilion show a great amount of important work put in hand, and speak highly for the competency of the architects employed by the Municipality in carrying out their projects in public building.

The contents of the west pavilion of the Municipal Exhibition are illustrative of subjects less directly connected with building work, but many of them are of much interest in themselves, and some illustrate rather emphatically the French tendency towards elaborate statistics. There is a whole series of statistical maps of Paris, variously coloured to show the proportions of population of special ages in the various Arrondissements; another set showing the proportionate prevalence of various diseases; while a third set shows the proportion of persons, married, single, widowed, and divorced, in the various quarters of Paris; and a fourth set the proportionate numbers of various nations inhabiting the different quarters of the city. Any one giving some time to the study of these statistical maps, along with a detailed plan of Paris, would probably derive a good deal of interesting suggestion from them as to the reasons for the various local prevalences. It is observable that the highest average of married people is round the outer portion of the city; probably because house-room is cheaper there. The region where there is the highest proportion of young children from one to four years of age is to the south-west of the Île de France, between the Quai des Augustins and the Boulevard St. Germain; why there should be more young children there than elsewhere we know not. In the maps showing the proportion of different nations represented, the specially English quarter appears as that stretching north-west from the bend of the Seine just above the Champ de Mars. There are other maps showing the density of population per hectare in various parts of Paris, which would have considerable practical interest, no doubt, in connexion with the maps of prevalent diseases, but we had not time for this, nor would the crowded state of the Exhibition have admitted of any minute study of the numerous maps. We observed also a series of statistical maps of France giving the distributions of stature, length of foot, colour of the eyes, and brain development for different districts of France; these,

however, appear to be taken from prison and workhouse measurements, and are therefore perhaps hardly reliable as representing general conditions. This department of the Municipal Exhibition shows that the city government of Paris is collecting an immense number of facts which may be of great value to students of anthropology.

The first portion of the west pavilion is occupied by a fine show of fire-engines and fire prevention and rescue matériel. Here we find also a map, in relief, of Paris, showing the water pressures at various zones of height, with all the reservoirs and watercourses laid down. In the next compartment are found the ambulance and hospital exhibits.

Below this a considerable space is devoted to educational exhibits. We have details of the work of the Primary Schools, which includes the rudiments of various technical trades—turning and other mechanical work, of which the results are exhibited. The "École Diderot d'Apprentissage," a technical school of a more advanced type, makes a very good show of metal-work and pattern-work, all executed by pupils of the school. Below this is a large space devoted to the illustration of instruction in drawing as carried on under the Municipality. An immense number of students' drawings are hung, a brief survey of which leads to the conclusion that they are not in advance of similar work done in the English Departmental schools of design; in figure drawing and drawing from the round, and modelling, there seems nothing to choose between the English and French students' work; and in coloured decorative design the English work may be said to be superior. The school fixtures for drawing schools are exhibited; the upright frame before each seat, with clips for supporting the copy, and the shelf and trays for pencils, &c., are all very well arranged, but the desk on which the pupil draws is absolutely level; a mistake, to our thinking: too much slope is inconvenient, no doubt, but some is required for comfort in drawing. The scholastic exhibition concludes with a display of gymnastic plant for schools, a subject to which the French are turning much more attention than formerly, and in regard to which they have recently paid us the compliment (not undeserved) of sending officially to England for special information and experience.

Altogether, these two pavilions in illustration of the organised work of the Municipal Government of Paris are of great interest, and give a high idea of the energy and the methodical organisation which is brought to bear on public works of construction, sanitation, and education. In some things no doubt they are behind us, and it is noteworthy that in the Exhibition, and in the large hotels &c. in Paris, the names of English sanitary engineers meet the eye continually, as affording the best guarantee to the visitor that this portion of the construction is satisfactory. In other points we may certainly take hints from them, and at all events everyone interested in building and sanitary regulations, and the other work incident to the well-being of a populous city, will find it well worth while to spend some time in the "Ville de Paris" Pavilions of the Exhibition.

#### HOUSE PROPERTY.

**D**AY by day new companies are presented to the public, and day by day promoters obtain even more money than they need from investors. Some of these undertakings are sound, some are the reverse: but the main point worthy of notice is that there never was a time when money was more abundant and investments more sought for. The inquiry, therefore, naturally arises what effect has this state of things on house property, and how is the latter likely to be affected in the immediate future? House property, generally speaking, may be regarded as consisting of two kinds, namely, country and urban houses. The first class is to a large extent affected by the value of agricultural

land, since in many instances country houses are closely associated with farms and large landed properties. As regards this class of houses it seems unlikely that it will go lower in value. Agriculture may not improve, but agricultural land can now be bought to pay a small and sure rate of interest, and with the present low rate of interest returned by Consols, investors will be satisfied with lower interest for landed investments. Of course it takes some time for any kind of investment to recover from the shock which landed property has during the last few years received. But after a time confidence returns, new men become interested in the various properties, and it is certain that the general public will gradually perceive that there are worse investments than land, at any rate for surplus incomes.

There is also the fact to be borne in mind that the existing houses in the country and in country towns are not exposed to the competition of new houses, as are existing ones in London and in or near large towns. The consequence must necessarily be that house property in the country will now probably advance slightly in value—at any rate, it is hardly likely to recede. It must, of course, be noted that many more people live at such places as Bournemouth, Hastings, and so forth, who formerly would have lived in some country town, and consequently, except in the case of professional persons, there is not the same desire now as there was to live in a small provincial town. But it is obvious to any observer that the small country towns do not grow in size. Hence the demand for houses in them is not over-supplied, and so owners not only of purely country houses, but of houses in or close to quiet provincial towns, may regard the immediate future without misgivings.

But it is doubtful if the same hopeful view can be taken of house property in or near London and in or near the great towns. It does more than stand still in value; on the whole it depreciates. The same causes which are now tending to steady the value of property in the country are tending to depreciate it in the large towns. The abundant supply of money enables builders to go on opening up new districts and erecting new houses. New houses have always an attraction for many people, and a few modern additions, such as electric bells, attract residents. In a word, the supply exceeds the demand, and it is the existing houses which, in consequence, suffer most. The shipping industry has recovered its prosperity very much because there came about a cessation in the building of new ships—but there is no cessation in the building of new houses, because the new houses get as a rule taken up, whereas a new ship was practically no better than an existing one in good order, and so the new and the old ship competed on equal terms. We look, therefore, to the value of house property in London, Liverpool, and other great towns falling in value. There is no reason why the speculative builder should cease his operations, for he can get rid of his new houses, and he cares not what may befall the purchaser five or ten years hence. Of course, there may arrive a time when the supply of houses is so much above the demand that there will be a cessation in the erection of new buildings. But the immigration to London and the large towns, and the increase of population, keeps up a demand sufficient to prevent a regular crash, but not enough to prevent a gradual diminution in the value of existing houses. The great moral for the ordinary individual to bear in mind is to be cautious before he buys a house in a new district, and to see if he cannot find in parts where the tide is ebbing somewhat better value for his money than in newly-erected buildings.

**Industrial Exhibition in Gothenburg.**—The Artisan and Industrial Association of Gothenburg has decided upon holding an industrial exhibition in that city in the summer of 1891.

\* We gave an illustration of this front in the *Builder* for July 29, 1888.



## NOTES.

**I**N the letter which the London County Council have addressed to the Board of Trade concerning Major Marindin's report on electric lighting in London, they express their approval generally of the recommendations made therein. Some suggestions, however, of considerable importance are made. The Council propose that ultimately subways or conduits shall be constructed by them, and that, to prevent the constant opening up of the roads, the electric lighting companies shall be compelled to use such subways for their cables, and shall pay rent for such use. The Council further suggests that companies who have their cables already laid shall be compelled to move them into the subways when constructed, but that, as a set-off against the expense of removal, they shall be allowed three years' rent. This seems very hard on the pioneer companies, for the allowance of three years' rent will certainly not refund the capital sunk in the cable-ways and the expenses incurred in removal. In addition to this, there is a most serious point which the Council, from want of expert evidence, seem to have entirely overlooked. Between every few houses along the line of route of an electric cable there is a junction-box, and a joint made from which the smaller branch wires are taken into the buildings. It is obviously out of the question to make these junctions at exactly the same points in the subway, and in cases of enforced removal, the question of utilisation of the old cables deserves some consideration. The longer lengths of cable can doubtless be used again with a certain amount of waste, but unless a company would risk using a patched and mutilated main, the proposition practically means that the moment a new subway is constructed the companies in the district must entirely reconstruct their underground system. It appears to us that the hardship might be minimised in some such way as this:—The subway having been built, any new cable must compulsorily be laid in it; but so long as the companies merely require access to their junction-boxes, such access should be freely permitted. If any old cable requires renewal it might be a definite rule that the new one should be placed in the subway. When we consider the licence allowed to water and gas companies, we do not like to see a new industry seriously handicapped by such rigorous regulations.

**T**HE Board of Trade are taking very prompt measures with regard to the new railway rates and charges, having already issued circulars to the railway companies and the objectors, explaining their views and offering suggestions. They have found that the protests which have been received may be roughly divided into two classes,—objections on principle, and objections on matters of detail. Under the first head are included such matters as "terminals" and short distance charges, while the differences arising upon the classification are placed in the second division. The Board of Trade have come to the conclusion that the first step to be taken is for the objectors and the railway companies to endeavour to come to an agreement upon the details of the classification, leaving the general conditions and other matters coming under the first of the two classes for future consideration. With a view to bringing about such agreements the companies have been requested to place themselves in communication with the objectors, and to arrange for interviews at which the disputed points may be discussed. This course will doubtless facilitate matters, if the parties approach each other in a proper spirit; and a settlement may be arrived at on some points much earlier than we anticipated last week, as the Department ask for particulars of the arrangements made (or the points still at issue, as the case may be) by August 1. We presume that interviews will be arranged for in various centres, at which attempts will be made to deal with as many individual objections as

possible at the same time; and it is to be hoped that the result of the negotiations will be satisfactory, and the subsequent work of the Board of Trade thereby lessened.

**I**N Saturday's *Times*, Mr. Arthur J. Scott, writing from the Travellers' Club, raises an alarm which, if all his information be correct, ought to be attended to at once, as to a proposition to remove the Boulak Museum at Cairo from its present building to the palace at Ghizeh, on the ground (as stated) that the latter is a more attractive holiday site. Mr. Scott says:—"The palace of Ghizeh is totally unfit for the purposes of a museum. It is one of the numerous palaces built by the Khedive Ismail in the heyday of his extravagance, and, though it must have cost a very large sum of money, it is already in a dilapidated condition. The roof was never properly finished, and admits the rain in every direction; the floors and walls are unsound, and quite incapable of supporting the weight of the collection and of visitors; the lath-and-plaster cornices and ceilings are cracked and falling to pieces, and no amount of money can render it a suitable building for the exhibition of the objects of art proposed to be placed in it." The Boulak Museum is such an exceptional and valuable one—now of European fame—that in view of the correctness of this information as to the proposed new building, a strong protest ought to be entered by English archaeologists, who are, perhaps, of all nations the most interested at present in Egyptian antiquities. Perhaps the newly-formed Society of Egyptian Archaeologists will turn its attention to the matter.

**A**S the rating of ground-rents has now become a subject of practical interest, it cannot be too fully discussed by competent persons. We are glad, therefore, to see that Mr. George Beken recently read a paper on the subject at the Surveyors' Institution. We are inclined to agree with Mr. Beken that legislative interference is not very desirable, in the interests of freedom of contract, at least as regards existing ground-rents, because it is obvious that the landlord has made his bargain with the lessee on the terms that his ground-rents will not be taxed. This objection, of course, does not apply to the taxation of new ground-rents; but it is clear that, if they are to be subject to a tax, it will fall ultimately on the occupier. There is no legislative way of preventing this incidence of taxation, because even if the law declared that the ground landlord is to pay the tax, he can still raise the rent to a figure which will recoup him for the payment of the tax, and this increase of rent will ultimately come out of the occupier's pocket.

**W**E have received from Mr. George Trollope a printed report of the case of *Kinnaird v. Trollope*, which was decided last year by Mr. Justice Stirling. It will be also found chronicled in the Law Reports (39 Chancery Division, page 636). It has long been settled that when a mortgagor repays the amount borrowed on his property, he is entitled to receive back from the mortgagee the title to the property in its place. The case, in which Mr. Trollope was interested against the Provident Life Office, decides that the same rule applies when the mortgagor has parted with his equity of redemption. The point is essentially one of a legal and technical character, more interesting to lawyers than to builders, as the latter would hardly consider such a question without the assistance of a legal adviser.

**M**R. WILLIAM WATERSTON, builder, Edinburgh, has conveyed to the Edinburgh Merchant Company property at the west end of that city of the value of 30,000*l.* to be held in trust for the benefit:—(1) Of aged members of the Company in reduced circumstances; and (2) Of respectable men above sixty years of age who had been employed as workmen in the building trades. Mr. Waterston suggests that the benefits

should be conferred, not in the name of charities or pensions, but as gifts from friend to friend with hearty good will. The Merchant Company administer large funds for educational and other purposes, and as Mr. Waterston was, at one time, a Governor of its trusts, he is in a position to know how they were managed.

**T**HE Directors of the Royal Asylum for Lunatics, Edinburgh, have approved of plans for a new asylum prepared by Messrs. Sydney Mitchell & Wilson, architects. The ground-plan is in the form of the letter E, with an elongation of the central projection backwards, the open face being towards the south. The architectural style adopted is the later phase of the French Renaissance. The central feature of the design is a great hall, with a high-pitched roof and tower 32 ft. square, rising to a height of 100 ft. At one angle of the tower there is corbelled out a circular stair turret, which rises over the balustrade of the flat roof. Other towers are introduced at the angles, and on the faces of the south projections and wings, which rise to a height of 75 ft., and are capped with bell-shaped roofs. The projections are finished with decorated pedimented gables. The materials to be employed are red sandstone with yellow freestone dressings, the roof-covering to be of green slates. The building will occupy a richly-wooded height, and will form a conspicuous object in the landscape. The cost of the building and accessories is estimated at about 60,000*l.*

**T**HE Committee of the Naval and Military Exhibition to be held in Edinburgh have decided to open the exhibition in the galleries of the Royal Scottish Academy, on the anniversary of Waterloo, Tuesday, June 18. Already numerous portraits of Wellington and Napoleon have been sent, and many of the articles to be entrusted to the care of the Committee are of great intrinsic value, the collection of medals alone being estimated as worth many thousands of pounds. In the meantime, an insurance has been effected with Lloyd's for 40,000*l.*, to cover risk from the time the articles leave the possession of the owners until they are returned.

**A** PAPER on water-supply for small towns and villages, read by Mr. R. E. Middleton, C.E., before the Civil and Mechanical Engineers' Society in April last, shows that water may be collected in the greensand formation and other water-bearing strata by pipes laid in trenches, which are afterwards filled in with sharp sand, with which stones may be mixed when sand is not plentiful. In one case Mr. Middleton found the natural porosity of the greensand to be about one-fifth of that of loose sharp sand. The length of collecting-pipes for a small town of 3,500 population, in the West of England, was 594 yards of 9 in. diameter, 352 yards of 6 in., and 1,342 yards of 4 in., the water being delivered to the town through a 4-in. cast-iron pipe. Taking into account the cost of the service-reservoir and the distributing-pipes, the total cost per head of the population was 22s. 10d. In a village of 600 inhabitants, the cost was 73s. 4d. per head; but this large amount per head is accounted for by circumstances which were not of a favourable nature. Another instance is a village of 1,250 inhabitants, supplied at a cost of 39s. 3d. per head. A comparative statement of cost, however, is better shown by the annual charge, and the money being borrowed at the moderate rate of interest usual in such cases and repaid in equal annual instalments extending over thirty years, the annual charge in the first of these cases is 1s. 9d. per head, in the second 5s. 4d., in the third 2s. 1½d. for that time; but afterwards only 9½d., 3s. 3½d., and 1s. 9½d. respectively. In these three instances the water is supplied by gravitation. Two more were referred to where the water is pumped from low ground to a sufficient height; in one of these the population is 6,000, and the cost was 30s. 4d. per head. In the other case, with a population of 2,000, the cost was 54s. 6d. per head. The annual



charges in these cases are, for the first thirty years, 2s. 3d. and 5s. 8d. respectively, and after that period 11d. and 3s. 8d. In most cases the cost of a water-supply would lie between these two extremes.

THE report of Mr. J. Wolfe Barry, C.E., on Ballycotton Pier, County Cork, shows the complaints made against its construction and stability to have been much exaggerated. After personally examining all parts of the pier with his assistant, Mr. Gifford, he came to the conclusion that two parts only of the pier required any work to be done. He recommended that the head of the new pier be strengthened with stout galvanised iron bands, carried back to and connected with the main portion of the pier. The bands, though galvanised, would after a time suffer from corrosion, but they would last many years if painted after the zinc coating had worn off, and they could be easily and inexpensively replaced when necessary. The new pier is an extension, 340 ft. in length, of an old one erected in 1847. The head of the old pier projected into the harbour 100 ft. This portion was to have been removed completely away, but some of the debris appears to have been spread on the bed of the harbour, and although this did not exist to any great extent when Mr. Barry made his report (December 21, 1888, although only recently printed and issued), it was higher than it ought to have been, and he recommended that the harbour be at this part deepened. The inner and outer walls of the pier are of concrete. The mode of construction contemplated under the contract was that up to the level of low water of ordinary spring tides it should consist of blocks of Portland cement concrete, weighing about five tons each, placed in position by divers; but after the contract was let, the contractor, Mr. Martin, offered, without extra charge, to construct this lower part with blocks weighing from twenty-four tons to fifty-three tons in the outer wall, and from twelve to fifty-five tons in the inner wall, an offer advantageous to the stability of the work, and which was accepted. The height from the foundation to 3 ft. above low water was thus raised in two tiers, a height of about 21 ft.; the upper, 12 ft. to the roadway, 3 ft. above high water of ordinary spring tides, being formed of concrete mixed *in situ*. The depth of water at the pier-head is about 13 ft. at low-water, and the range of a spring tide about the same. The bottom is sand; and, on the evidence of the diver, is easily moved in stormy weather, and notwithstanding that the foot of the wall is protected by rubble stone, two decided cracks in the pier-head were produced by the violence of the waves. Small and less important cracks also occurred in the mass of concrete deposited *in situ*, but these did not indicate any movement of the wall, and were probably due to the contraction of the material, which often takes place in great lengths of concrete made in one piece. On the whole, the report must be considered to vindicate the design and construction of the pier by the engineers of the Irish Board of Works, by whom it was transferred to the keeping of the County Surveyor, acting on behalf of the Grand Jury of the County, who declined to accept it unless the Government procured an independent report upon its actual condition. These difficulties have often arisen in Ireland from the divided responsibility of these two great authorities,—the one local, the other a department of the Government of the country.

ON August 28, 1886, we published a view of Ightham Mote House, near Sevenoaks, amongst our illustrations of the excursion in that year of the Architectural Association. This singularly interesting specimen of a fourteenth-century fortified dwelling-house is now in the market, and will be put up for sale by auction at the Mart on the 9th July next, by order of the late Mr. Charles Selby Bigge's executors. To what we said in our descriptive text on 21st August, 1886, we may here add that the

property, being about 580 acres in all, is divided into nine lots, whereof eight are set apart as sites for building purposes. In the same month will be similarly offered for sale another notable mansion,—Hengrave Hall, situated within three or four miles of Bury St. Edmunds. This house was built by Sir Thomas Kytson, in the year 1525, and was since occupied by the Gage family. The whole property, including the home park of 300 acres, extends over nearly 4,600 acres, whereof the River Lark forms the northern boundary. The sale includes the old parish church, now in ruins, supposed to have been dedicated to St. John Lateran, together with the manors of Hengrave, Fornham, Risby, and All Saints; of this latter unfortified house we gave two or three sketches, together with a brief account, in our numbers for August 16, 23, and 30, 1884.

DR. THEODOR SCHREIBER, Professor of Archaeology and Director of the Museum at Leipzig, is about to edit a work which will be of great importance to archaeologists. It is to consist of a series of hitherto-unpublished Hellenistic reliefs, reproduced in heliogravure. There are to be in all 112 full plates and a volume of text, illustrated with a large number of cuts, the whole to be under the auspices of the Philologisch-historischen Classe der Königlich-sächsischen Gesellschaft der Wissenschaften, and to be published by Engelmann, Leipzig. The publishers promise that the work shall be complete at the end of the year, at a cost of 220 marks (i.e., about 11*l.*). The number of "series" of this sort is constantly on the increase; their value to science is undoubted, but their cost is great. We would suggest that the publishers would do well, and would secure a larger number of purchasers, if they would at the outset publish a list of the plates to be issued. In a work of this magnitude the reliefs to be published must necessarily be chosen long in advance, and purchasers would know where they were. We may add that an *édition de luxe* is to be published at 16*l.* 10*s.* The number of copies issued in both editions will be small.

PROFESSOR WALDSTEIN, in a letter to the *Times* of Tuesday, records his conviction that the supposed discovery, some time ago, of the tomb of Alexander the Great at Sidon is something more than a mere archaeological flourish. He says that the photographs of the fragments discovered, which he has since seen at Constantinople, have convinced him that the discovery is one of the most important made in this generation. Professor Waldstein says—

"There are several sarcophagi of various dates, showing an interesting development of tombs of the Lydian type, some reminding us of the monuments from Xanthos in the British Museum. But one of these stands apart for its supreme beauty. It has pediments containing relief in which the polychromatic additions are wonderfully preserved. These reliefs are unique in character. In style they remind us of some of the friezes from the Mausoleum of Halicarnassus, and can hardly be later than the beginning of the third century B.C."

The subject of the one pediment,—a representation of a lion hunt,—is quite clear, inasmuch as it contains an undoubted portrait of Alexander."

It is to be hoped that we shall not have to wait long for published illustrations of a discovery of such unusual interest.

IN the June number of the *Classical Review*, Mr. Murray draws attention to a beautifully-engraved gem recently acquired by the British Museum, and which he thinks may throw light on a very interesting and much disputed question, i.e., the origin of the *egis* of Athene. The gem (found at Amathus) represents a figure of Athene, but after a quite exceptional manner. Behind her neck is the Gorgon's head in profile, lower down the snakes of the Gorgon, which latter formed the fringe of the *egis*, then a pair of wings also belonging to the figure, in fact, her whole *exuvie*. This certainly seems to illustrate the passage of Herodotus, iv., 189, where he states his opinion that the Greeks got their idea of

the dress and *egis* of Athene, as seen in her statues from Libya, where it was the custom to go clad in skins of animals which were called "*agies*" (*aiyētes*). From Dion Chrysostom (Orat. V.) we learn that the skins were worn behind, so as to leave the face and breast bare; in fact, just as Herakles wore his lion-skin. The *egis*, then, is the skin and spoils of the Gorgon. In accordance with primitive custom, Athene threw them over her neck and shoulders, and only later began to wear them on her breast. Mr. Murray thinks that in archaic vases, wherever only a fringe of snakes is visible, the head of the Gorgon may possibly be conceived of as actually on the back of the figure. He might have cited the charming Berlin vase, in which Athene appears at the birth of Erechthonios; here the *egis* is clearly worn over the back. We should be glad to be rid of the "storm cloud" interpretation, only if the *egis* be the *exuvie* of the Gorgon, what is to become of Zeus the *egis*-holder? and, still more, what is Mr. Lang to do with his *agies* and the goat totem? The gem, we hope, will soon be published.

THE *Berliner Philologische Wochenschrift* (June 1, 1889) reports the discovery of an interesting mosaic at Sparta. It is of quadrangular shape, and made up of quadrangular pieces of stones, fitted together with the utmost care and nicety. In each corner is introduced a portrait of some famous person. Two are inscribed. The one—admirably preserved—represents Sappho (ΣΑΠΦΩ), the other, which, unfortunately, is very indifferently preserved, represents Alcibiades (ΑΛΚΙΒΙΑΔΗΣ). Sparta is very rich in mosaics, but those discovered hitherto are coarse in style. Representations of Sappho are rare, and this portrait is a welcome addition. The same issue of the *Wochenschrift* notes, with regret, that the negotiations for the excavation of Delphi are again brought to a deadlock, owing to the refusal of the Austrian Government to pay certain loan moneys. The inhabitants of the village of Kastri are not unnaturally beginning to show symptoms of discontent. How can they attend to their business with this uncertainty of removal constantly hanging over them? Delphi has pretty well gone the round of the markets of Europe, and perhaps local agitation may supply the needed stimulus.

A REPORT by Dr. Parsons to the Local Government Board (March 15) deals with the causes of an outbreak of diphtheria at Camberley and York Town, in the Parish of Frimley, in the Farnham Rural Sanitary District. The inspection was directed by the Board at the request of the Farnham Rural Sanitary Authority, and was made in January, 1889. The following are among the causes of the outbreak suggested in the report:—

"Nearly all the cases of diphtheria have occurred in houses in damp situations. In Obelisk-street and Princess-street, Camberley, the roadways are, or were at that time, unmade, the surface being a filthy quagmire; they have since been partially put into repair. The soil is damp, in places quite boggy, and the water-level in wells is but little below the surface. Pembroke-cottages, near the bottom of Princess-street, form a row of eight concrete cottages, a good deal out of repair. They have no through ventilation, and the floors are almost below the level of the ground. There have been cases of diphtheria in five out of the eight houses, but there were abundant opportunities for the spread of the disease by personal intercommunication between the inmates of different houses. . . . Several of the houses invaded were also damp through defective over-spouting. The houses invaded were, for the most part, comparatively modern cottages, semi-detached or in rows. . . . The sewers discharge by two outfalls on a piece of irrigation ground in the low ground near the Black-water. The sewers are of pipes, and are intended to convey only sewage and (in part) roof-water, road-water and sub-soil water being excluded, though a good deal of the latter finds its way into the sewer in Princess-street. The joints of the Obelisk-street sewer, which was open at the time of my visit, were imperfectly made and leaky. The sewers are ventilated by tall shafts, and by grids at the street level; from some of the latter, offensive smell is complained of. . . . The inlets of the house-drains are as a rule out of doors, the sink-pipe discharging over a trapped gully. The sink-pipe itself is often untrapped,



and hence any foul smell arising from the fur with which it is apt to get coated, especially when of any considerable length, or of wide calibre, is able to enter the house. The closets at cottages are usually hopper-closets connected with the drains; they have no water laid on to them, and are supposed to be flushed by pouring down water by hand; the quantity of water thus used is, however, often insufficient to keep the drains clean."

We italicise those two sentences: the latter because that force of closets supposed to be flushed by pouring down water by hand is over and over again coming up in these reports, and is one of the worst of the insanitary conditions prevalent in poor neighbourhoods and inferior cottage property. It is always practically found that flushing by hand means not flushing at all. And we draw attention to the matter of the untrapped sink wastes because that is a point on which there is a great heresy even among sanitarians. It is constantly being laid down that a sink-waste discharging over a gully requires no trap or bend under the sink. The result of this, as stated in Dr. Parsons's report, is that there is almost always an offensive smell at the sink from matter that has adhered to the sides of the waste-pipe.

**MR. SPEAR'S** report to the Local Government Board upon an epidemic of scarlatina in the Faringdon Rural Sanitary District, and upon the sanitary administration of that district, dated April 4, condemns the administration as very inefficient. The report says:—

"The Poor Law Medical Officers are the Medical Officers of Health for their respective districts. In each case the salary is 10*l.*, no part of which has been repaid from the Parliamentary grant. . . . The Medical Officers of Health report at quarterly and yearly intervals. In the reports presented for the last three years (including the annual reports of 1885), I can, except in one instance, find no definite information regarding the sanitary condition of either of the four districts. The exceptional instance is that of a report by Dr. Miller, late Medical Officer of Health for the Lechlade District, who, *à propos* of an outbreak of typhoid fever in the second quarter of 1885, states that he had made a house-to-house inspection of the greater part of the village of Lechlade, and found that the well-water was in a large majority of cases polluted by surface filth. The effect of the Medical Officer's activity in this single instance is noteworthy. Following it, the Authority entered upon a scheme for supplying Lechlade with water from a general source. The Medical Officer of Health complains in the next annual report that he had not been consulted upon the proposed scheme, and expresses some doubt, apparently with reason, as to the freedom of the projected source of water-supply from risk of contamination. Moreover, up to the present date, little progress has been made with the work. Still the fact remains that when adequate representation was made to the Sanitary Authority notice was taken of it, and action was thereupon commenced.

The remaining reports have consisted chiefly of complainant remarks upon the health of the district and congratulations upon its sanitary state."

In reference to the sanitary mechanism of the district, the Report makes the following among other criticisms:—

"The private drainage of the town is very defective. A large number of houses are provided with pan or hopper closets, connected with the sewers, but having no flushing apparatus. These are generally very foul, the water-supply available being scanty, and flushing accordingly neglected. Ventilation of the inadequately-flushed drains, which discharge into wholly insufficiently ventilated sewers, is almost unknown. In many cases drains pass beneath houses, no special precautions being used, and gullies with direct connexion are occasionally within the houses (cellars, &c.). The escape of drain air in and about houses is a common cause of complaint. . . . The house accommodation of the town requires much attention. The cottages are often very small, the rooms ill-ventilated, and occasionally overcrowded. Dampness, both from the roof and from the foundations, is little guarded against; certain houses in Foundry-yard, for example, are quite unfit for habitation from this cause."

**WE** hope that the publishers of the new edition of "Chambers' Encyclopedia" (the third volume of which has just been published) will forgive us for saying that they show a customary Scotch incapacity for seeing a joke, otherwise they would hardly have admitted in the preliminary list of "important articles" that of the Channel

Tunnel, the author of which article is in the same place stated to be Sir Edward Watkin. When the article itself is referred to, the matter is still more amusing, for, as we all know, no such thing as the Channel Tunnel exists,—there is only an experimental boring on either side of the Channel, and these borings together are not more than one-tenth of the proposed tunnel. Sir Edward Watkin's article is, therefore, obliged to deal with the future, and to describe what the Channel Tunnel would be if at some future day, which at present is certainly very distant, Parliament were to sanction the scheme. It has been said that one of the causes of some great men's success has been their care for little details, and certainly Sir Edward Watkin, when he obtains the insertion of an article in this "Encyclopedia" about his cherished scheme, shows an amusing regard for a small bit of advertising.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—VII.

1938. "Design for Apse Window, Ranmoor Church, Sheffield": Messrs. Shrigley & Hunt. A two-light window of unusual design; the subject is the Resurrection; in the upper portion of one compartment is the figure of Christ risen, in the other two angels adoring; their wings form part of the colour background of the scene. These figures are all in nearly white drapery, giving a bright appearance to the upper part of the light; below are two guards in armour, one sleeping, the other looking up as if aroused. The small lights in the tracery head are filled with cherubim. There is a great deal of originality, and a fine broad effect, in this design, which seems, however, to want more leading to give it the true constructive character of stained glass.

1941. "Design for Memorial Window to Admiral Blake in St. Margaret's Church Westminster": Mr. E. Frampton. The recognised necessity of making a church window religious in subject and figures has led to a rather high-wrought treatment of this memorial to a sea-captain who, great as he was, is not exactly associated in our minds with Michael combating the dragon, which fills one of the three compartments of the window; the figure on the other side we do not understand, it appears to be that of a saint trampling on fire; the centre compartment, representing Peter sinking and Christ on the sea saving him, Blake would not have liked, as he would have said he was in no danger of sinking on the sea. The conception of the whole seems to us puerile; the design of the main compartments, with the upper portions of the three figures relieved against a representation of sky, and the elaborate canopy work over, is good and effective. Subjects illustrating the death and the state funeral of Blake form a predella.

1942. "House and Studio, Avonmore-road": Mr. Jas. M. MacLaren. A pleasing bit of domestic street architecture, to which some special character is imparted by the arrangement and design of the windows, and the decorative adjuncts applied to the principal ones.

1946. "Salisbury Cathedral from the South Transept": Mr. Jas. Cafe. A water-colour drawing very successful in regard to aerial effect and the representation of the varied tones of masonry in sunlight shadow and half-light; in this respect it shows much artistic feeling, but it is a weak drawing in regard to texture and detail of execution, in comparison with the complimentary position which has been assigned to it.

1947. "Church of St. Ethelburga; the Chancel": Mr. H. D. Wilkinson. Apparently this represents some decoration to the chancel, shown in a pen-and-ink drawing, and the addition of a vestry *ko.*, shown in a small plan, but not illustrated in the view. It is an effective drawing of the kind, but conveys no indication as to what is specially intended to be shown.

1950. "The Falcon Cocoa-house, Chester": Mr. John Belcher. A small water-colour drawing showing a charmingly picturesque half-timber house, we presume new work in imitation of the old Chester style.

1951. "Project for west window of Chesterfield Church": Mr. F. Hamilton Jackson. This is a broadly-executed study, on a small scale, for stained glass for a large seven-light Late Decorated window with a number of subjects,

which do not explain themselves very well on this small scale. The general effect of colour is good, and the treatment shows a thorough feeling for stained-glass effect; but it is to be hoped the proportions of the figures will be revised in detail; many of them are very lengthy.

1952. "Koble College Chapel, Oxford": Mr. Cecil B. Roper. This, a small pen-drawing of the interior of the chapel, merits notice for its manner of execution, in which a great deal of softness of effect has been obtained by the manner of working entirely in small and broken touches.

1955. "New School Buildings at Repton, Burton-on-Trent": Sir A. Blomfield, A.R.A. Two blocks of red-tiled buildings in simple Domestic Gothic style, with mullioned windows and battlemented parapets between the gables. A porch or arcade of three pointed arches between buttresses forms a feature on one side. It is a pity no plan was given. The drawing is a good example of architectural water-colour drawing, clearness of definition of the buildings being the principal object, but the landscape is sketched in with much truth of tone; the sky is particularly good.

1956. "St. John's Church, Stanstead Montfichet, west end": Mr. W. D. Carol. A large coloured drawing of a brick church with stone dressings, very effectively executed, in which the prominent object is a massive and richly-treated tower of Late Gothic type, with pinnacled and battlemented finish. As in the case of another tower design of similar type before referred to, we question whether the slated "spike" appearing above the battlements is any improvement to the effect of a tower of this kind, the characteristic of which is squareness and solidity; the addition of the spirelet introduces another kind of effect, not in keeping with the main architecture.

1958. "Church Porch, Louviers": Mr. C. O. Murray. A powerful and effective etching, hung too high to be seen in detail.

1959. "West Front of the Cathedral, Honolulu": Messrs. Carpenter and Ingelow. A coloured elevation, more in the style commonly adopted in France than in England. There are two towers, perfectly plain in the lower portion, with long louvred windows above, and square slated spires with similar broach pinnacles at the angles. Between these is a gable, and beneath, three two-light windows filling up the front, with early Geometric tracery in the heads. A porch with three arches on cylindrical piers projects below beneath a lean-to roof, with gables over the arches, and sculpture in the tympana over the doors within. The whole, though very plain, has a fine character and individuality about it. The drawing affords a curious instance of the kind of optical illusion which the Greeks devoted themselves in so scientific a spirit to correcting; for, whether from the effect of the falling-in lines of the tower buttresses at the two extremities of the front, or from that of the gable lines over, the three large windows appear distinctly to spread slightly outwards as they rise. It does not follow necessarily that this illusion should be presented by the building in execution. We have observed it in drawings more frequently than in actual buildings.

1960. "New Premises, Eastgate-street, Chester": Mr. T. M. Lockwood. A creditable specimen of the modern timber front built in imitation of the old Chester style. It would be quite possible, however, to design street fronts to harmonise with old Chester without adopting this rather perishable manner of building, which, moreover, adds distinctly to the danger from fire in the town. Mr. Lockwood makes the most of a conventional Roman structure in Eastgate-street, which was built as a bank, as a foil to his own more picturesque front: a building, however, which was thus treated, we believe, against the wishes of its architect, and to gratify the ideas of the typical English banker, who does not believe he has a bank unless there are Classical columns or pilasters to it. An improvement on the British banker's conventional idea is seen however, in

1961. "Lancashire and Yorkshire Bank, Manchester": Messrs. Heathcote and Bandle. This is a large mechanically-executed pen drawing showing a costly building in Classic style, in which the architects have succeeded in giving something of the expression proper to a bank by the employment of massive square rusticated piers, with great depth of reveal, in the lower portion of the design; these, however, represent two inner storeys in height, as seen by the



windows, so that the monumental expression is somewhat disturbed. The piers are relieved by escutcheons midway, breaking their fine with good effect. The design belongs to the class of "handsome" buildings (some of our readers will understand the sense in which we use the expression), but it is a good specimen of the type.

1862. "New Offices, Carey-street, Lincoln's Inn": Mr. George Sherrin. This is rather an unnecessarily large drawing of a small but effective and picturesque bit of new building at a street corner behind the Law Courts. The building looks decidedly better in reality than it does in this drawing, which is ineffective and in a poor style of drawing. A small plan is given, and we may add (what the drawing does not show) that the interior treatment of the corridors and the circular stair-well is very good and effective. We may point out however, that the street front would have looked much better if the ground-floor windows had been partially filled with almost any kind of framing or mullions, instead of being left as great oblong holes filled up only with (we presume) a piece of plate-glass. The heavy carved panels and slightly-projecting bays over these empty spaces look weak and in want of support.

1865. "Board School, Rathfern-road, Catford Bridge": Mr. T. J. Bailey. This is a small and rural-looking Board School, partially in one story, with low walls, high roof, and gabled window bays carved above the eaves: otherwise it is in accordance with the traditions of London Board School architecture. It is shown in a drawing effectively tinted in Indian ink. Two plans are given, but the drawing is too high for them to be seen.

1866. "New Church, Barmouth, North Wales": Messrs. Douglas & Fordham. There are a great many drawings of churches on hilly sites this year, in which the nature of the site has evidently influenced the design. This is a fine and effective drawing tinted in brown, of which we published a reproduction in the *Builder* last week, to which we refer the reader. It is a church of late Decorated character, and of very solid construction, with a low massive heavily-buttressed tower (the right way to build among hills). The aisle on the lower side of the ground, which is next the spectator, has only a row of small square-headed windows under the eaves, with a mass of plain buttressed walling below. It is to be presumed that the interior floor is far above the ground level on this side, but what use, if any, is made of the space below there is nothing to show. In a picturesque point of view the drawing is one of the best in the exhibition, and occupies a central position on the west wall of the room.

#### THE CHURCH AND OTHER ECCLESIASTICAL FOUNDATIONS AT HADDINGTON.\*

HADDINGTON dates as a Royal burgh from the reign of David I., 1130. It was occupied as a Royal residence till the early part of the thirteenth century, when it was considered disagreeably near the English border. The Royal Palace was situated in King-street, now called Court-street,—on the site of the present County Buildings and Court Houses. Remains of some of the vaulting of the ground-floor of the Palace are said to have been removed when the Court Houses were built (1833). Alexander II. was born, in 1198, in the Palace of Haddington.

There were in and about Haddington a large number of ecclesiastical establishments, to wit:—The Parish Church; the Franciscan Monastery; the Cistercian Abbey (of Nuns); the Chapels of St. Martin, St. Ann, St. Katherine, St. John, and St. Ninian; the Hospitals of St. Mary and St. Lawrence. Of these ten establishments there are now but



Plan of Part of the Town of Haddington.

scanty remains. The town and buildings suffered much at various times by fire. In 1216 part of the town was burned by King John of England. It was hastily rebuilt of wood. In 1344, on the same night as Stirling, Roxburgh, Lanark, Perth, Forfar, Montrose, and Aberdeen, Haddington is stated to have been totally consumed by fire. In the year 1354, when Edward III. of England was in France, the Scots took advantage of his absence and seized Berwick. On hearing this, Edward hastily re-crossed the Channel and marched north to Newcastle. Here he issued a proclamation for all loyal subjects to join his standard. He then entered Scotland, laying waste the whole country the length of Edinburgh, and burned "the town and monastery of Haddington, as likewise the church of the Minorites or Franciscans." This day is locally known as "Burnt Candlemas," the event having happened in February.

Of the Hospitals, only remains of that dedicated to St. Lawrence exist. It was situated one man west of the town, and is said to have been built and endowed by James V. Besides a chapel and grave-yard there was a leper hospital there. Only a two-storey tenement of no architectural pretensions marks the existence of this hospital. A field near it is pointed out as the graveyard. The Hospital of St. Mary was in Haddington.

Of the Chapels, remains of St. Martin's alone exist. This chapel belonged to the Cistercian Convent, and is on the east side of the river, in Nungate. It is of early date, but of little architectural interest, unless it be to solve the problem as to the purpose of the square holes so frequently left through its walls. It is a rectangular building, measuring 54 ft. by 16 ft. internally, with a barrel vaulted roof. At the east end there is a narrow chancel arch, and evidence of the existence at one time of a small chancel about 12 ft. square. The site of the Chapel of St. Ann is denoted by the name "St. Ann's place." The Chapel of St. Katherine was situated "forment the Friar's Kirk." The site of the Chapels of St. John and St. Ninian are conjectural.

The Abbey of Cistercian Nuns stood one mile from Haddington, down the Tyne, where the village of Abbey still remains. It was founded in 1178 by Ada, Countess of Northumberland, the widow of Prince Henry of Scotland. This lady, the famous "mother of kings,"—viz., of Malcolm IV. (the maiden) and William the Lion,—dedicated the church to the Virgin Mary. It was richly endowed from temporal lands about Haddington and Crail, and held the churches of St. Martin's (Nungate), Garvald, Athelstaneford and Crail.

On Christmas Eve, 1358, the river rose in great flood, and seemed about to destroy the convent. One of the nuns, so tradition says, seized an image of the Virgin and threatened to throw it into the river unless the flood abated. It need scarcely be said that the water at once fell. In 1548, during the English occupation of Haddington, Parliament was convened here, and consent was given to Queen Mary's marriage with the Dauphin, and her education at the French court. The only remnant of buildings in connexion with this once splendid convent is the very fine old bridge. It is of three pointed arches, each built in five ribs, with filling-in between. At the Reformation, the greatest part of the lands belonging to the Abbey were granted to

William Maitland, younger, of Lethington, Queen Mary's secretary. They were afterwards erected into a temporal lordship in favour of John, Master of Lauderdale.

We have now disposed of all the foundations mentioned above except the Monastery of Franciscans and the parish church. There is considerable difference of opinion, and consequently much heart-burning, as to the identification of the existing church; some hold it to be the parish church founded by David I.; others hold it to be the Church of the Franciscans, founded in 1258, and dedicated to (?) St. Dutach. The question to be answered is in either of two forms:—(1) If this is the Franciscan Church, where is or was the parish church? or (2), and conversely, If this is the parish church, where is or was the Franciscan Church? There is, we shall find, sufficient evidence in post-Reformation records to answer the latter proposition.

At the time of the Reformation the chief lands of the monastery were made over to the town of Haddington. There is a document, written in Latin, from the Protocol Book of Thomas Stevens, in the Record Office, Haddington, quoting "The Disposition of the Friar's lands, kirks and houses, &c., in Haddington." This disposition, which was signed in 1559, gives the boundaries of the properties then transferred, and we shall endeavour to identify these boundaries.

The following is an extract from the Disposition translated into English:—

"We have given . . . to the relieve balliffs council and community of [Haddington] . . . all and every our said place church houses edifices gardens and dove houses . . . situate and being on the east side of the borough aforesaid between (1) the lane called the 'Friar Gowll' on the north, (2) the water of Tyne and the course of a certain pond on the east, (3) the high road which leads from the said borough towards the parish church of the same on the south, (4) and a certain waste land belonging to the said borough on the west." . . .

(1) There is a narrow lane, called at this day "Gowll Close," which we may assume as the northern boundary.

(2) On the east there is a short stretch of the river Tyne, then (southwards) the weir forms a mill pond.

(3) On the south there is a public road,—the continuation of the High-street leading from the burgh to the Nungate and towards the present church.

4. On the west there was a piece of waste land, because in 1676 the Burgh Records state, "The piece of waste ground at the back of St. Ann's Chapel was sold to George Anderson for 50 merks, feu duty 1 merk. Of course, nothing is naturally so difficult to determine as the boundary of a piece of waste land, therefore the exact line of this boundary is purely conjectural.

The other boundaries are, however, sufficiently accurate to make identification comparatively easy.

Upon this piece of land the Franciscans had their church and other monastic buildings. While excavations were being made recently for a drain through this ground some human bones were turned up, and some foundations were exposed at the places respectively indicated on the map annexed, affording additional evidence of the existence of a churchyard, or church and buildings on this ground.

\* A paper by Mr. Henry F. Kerr, A.R.I.B.A., read by him before the Members of the Edinburgh Architectural Association on the occasion of their recent visit to Haddington. Chief authorities consulted:—Disposition of the Friar's Lands, &c., from the Protocol Book of Thomas Stevens, Record Office, Haddington. Bigned 1559. Catalogue of Bishops (Spotiswoode's Account of the Religious Houses in Scotland) 1765. Trans. Soc. Antiquaries of Scotland, 1792. Statistical Account of Scotland, 1793. Caldonia, George Chalmers, 1810. Gazetteer of Scotland, R. & W. Chambers, 1832. Extracts from the Burgh Records of Haddington, published in the Haddington County Lists, 1854, & 1855. New Statistical Account of Scotland, 1845. Baronial and Ecclesiastical Architecture of Scotland, R. W. Billings, 1852. The Ancient Church of Scotland, Walcott, 1874. Ordnance Gazetteer, 1882. Guide to the Royal Burgh of Haddington, Robt. 1883. Burke's Peerage.



The Disposition goes on to say that the friars also give "that our croft of arable land . . . lying on the south side of St. Katharine's Chapel, between

(1) The gate called the King's Walls of Sydgate, on the east,\*

(2) The garden of the Vicarage of Haddington, and the graveyard of the parish church aforesaid, on the south,

(3) A certain piece of land called 'the buttis,' on the east; and

(4) The aforesaid chapel lands, also formerly of Robert Shorts and Robert Wauas respectively, on the north . . ."

The friars, therefore, had at least two properties,—one on which their church and conventual buildings were erected, and an arable croft.

The croft we can identify as that originally called the King's Yaird, which James III. made over to Sir Richard Cockburn, of Clerkington. We further find that Sir Richard gave this to the friars in 1477 for obits, &c., on the condition that if the friars ceased to perform the required services, the land should revert to Sir Richard and his heirs. At the Reformation, when the transfer of this land was made to the town, the friars did cease to perform these services, hence the Cockburns claimed the croft. The town, having been unaware of the condition on which it was held by the friars, had, in order to retain it, to make a special payment to the Cockburns. Haddington House was, in 1680, built on this land, and the croft was converted into a garden. This is the croft which, in 1792, led Dr. Barclay into the belief that the present church is that of the Franciscans, because "a field now converted into a garden, and which is still called the Friar's Croft, lies contiguous to the churchyard. . . ."

There are further links of evidence as to the Franciscan Church.

In 1561. The magistrates ordained that no person was to take stones from the "Hie kirk, or Friar's kirk, under pane of forty shillings." This is, conjoined with what here immediately follows, evidence that there were two churches, and that both were in a sorry state at the Reformation.

In 1572. Council ordained all the pavement of the Friar's kirk to be "transported to the Hie kirk and laid there."

Also. "Let in feu ferme to John Gray 3 roods of the Friar kirk lands, containing the Chalmer hall and kitchen—feu thirty shillings."

Also. The east gable "of the Friar kirk, from the sole up," given, in gift, to Thomas Cockburn, Clerkington.

In 1573. Thomas Cockburn charged to demolish, cut down, and take away the east gable of the Friar kirk, "otherwise the town will cast down the same at his expense." Here is plain evidence that the parish church was retained somewhat at the expense of the Friar kirk, and that the Franciscan Church was sacrificed, and its lands fenced off, and otherwise disposed of.

There is still one more link bearing upon the position of the parish kirk. In the Disposition which we have already quoted the lands of the monastery on which the church, &c., stood, were mentioned as bounded on the south "by the high road which leads from the borough towards the parish kirk of the same." Turning to the map, let us follow the road; it leads us directly to the churchyard gate of the present church, tending to the identification of the present church as the parish church. In an old print of Haddington† the churchyard appears to be of no greater extent westwards than is indicated on the map.

The last question for solution is, to which of the churches does the title *Lucerna Landonia*—the Light of Lothian—belong? We cannot now speak as to the size or beauty of the Franciscan church. However, if we try to place a church of equal size with the present church on

\* Probably an error for west.

† As for the identification of these boundaries, (1) The king's walls of Sydgate might refer to the wall of the King's Yaird in Sydgate. (2) There is no difficulty about the graveyard. From an old print it would appear that the graveyard did not formerly extend so far west as at present. It is, therefore, very probable that the vicar's garden adjoined the graveyard, lying between the graveyard and the public road. The old line of road is marked on the map. The vicar's garden, extending to the boundary of the King's Yaird, would certainly be in accordance with the bounds quoted. (3) "The Buttis." There is no doubt that here there was an old common, and evidence is still remaining of the games practised there, in the existence of the Ball Alley. (4) The probable position of St. Katharine's Chapel lands is marked on the map, and corresponds with the description recorded,—"Forneut the Friar's kirk."

† The same referred to in the note above.



Haddington Church: View from the North-West.



West Doorway, Haddington Church.

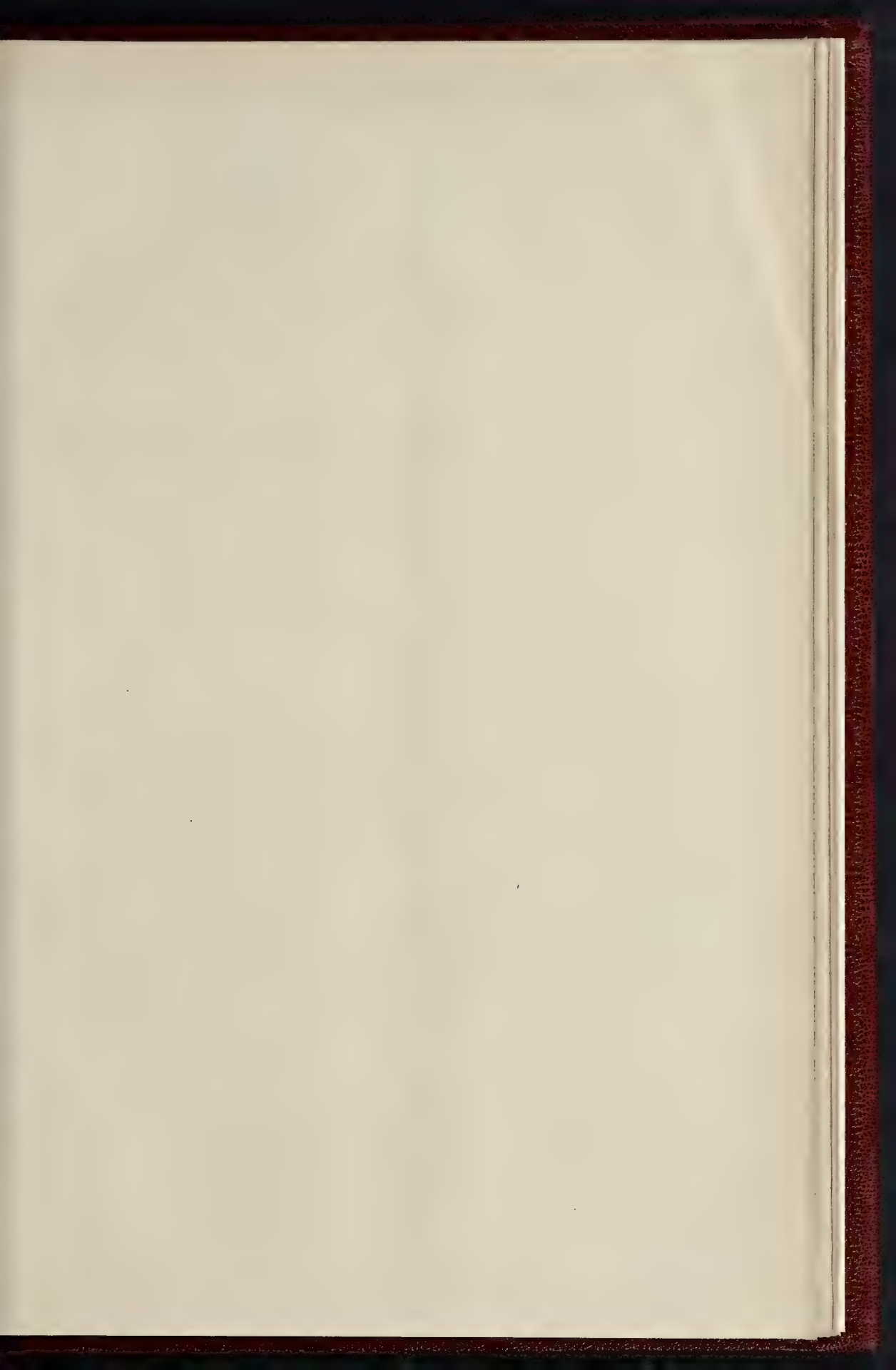
its lands, we shall find ourselves pinched for room. We are, therefore, tolerably safe in concluding that it was of considerably less size. Fordun and Major indicate the Franciscan church as the Lamp of Lothian, and it is quite possible that the Friar's Church was brilliantly illuminated throughout the night. But whether it was a more beautiful church than that now existing is open to doubt. It is, however, possible that the great beauty of the royally-endowed parish church, combined with the midnight vigils of the Friars, may have together given play to the fancy and force to the poetic figure of *Lucerna Landonia*—the Lamp of Lothian.

The Parish Church of S. Mary was founded by David I., and endowed with the lands of

Clerkington, on both sides of the River Tyne, and a toft in Haddington. In 1134, David I. gave this church to the Priory of St. Andrews, in perpetual alms, the church being served by a vicar. Haddington gave its name to a deanery. In 1558, the burgh records state that Sir James Mauchlyne was chaplain of S. James's Altar in the College Church of Haddington. In 1636, a second minister was appointed to the church of Haddington, as agreed at an Episcopal Visitation held the previous year.

At the Reformation, the lands pertaining to the church passed to James, Earl of Moray, bastard brother of Queen Mary. During the Regency they were usurped by the Earl of Morton. Thereafter they were forfeited by the Crown, and subsequently presented by James VI.





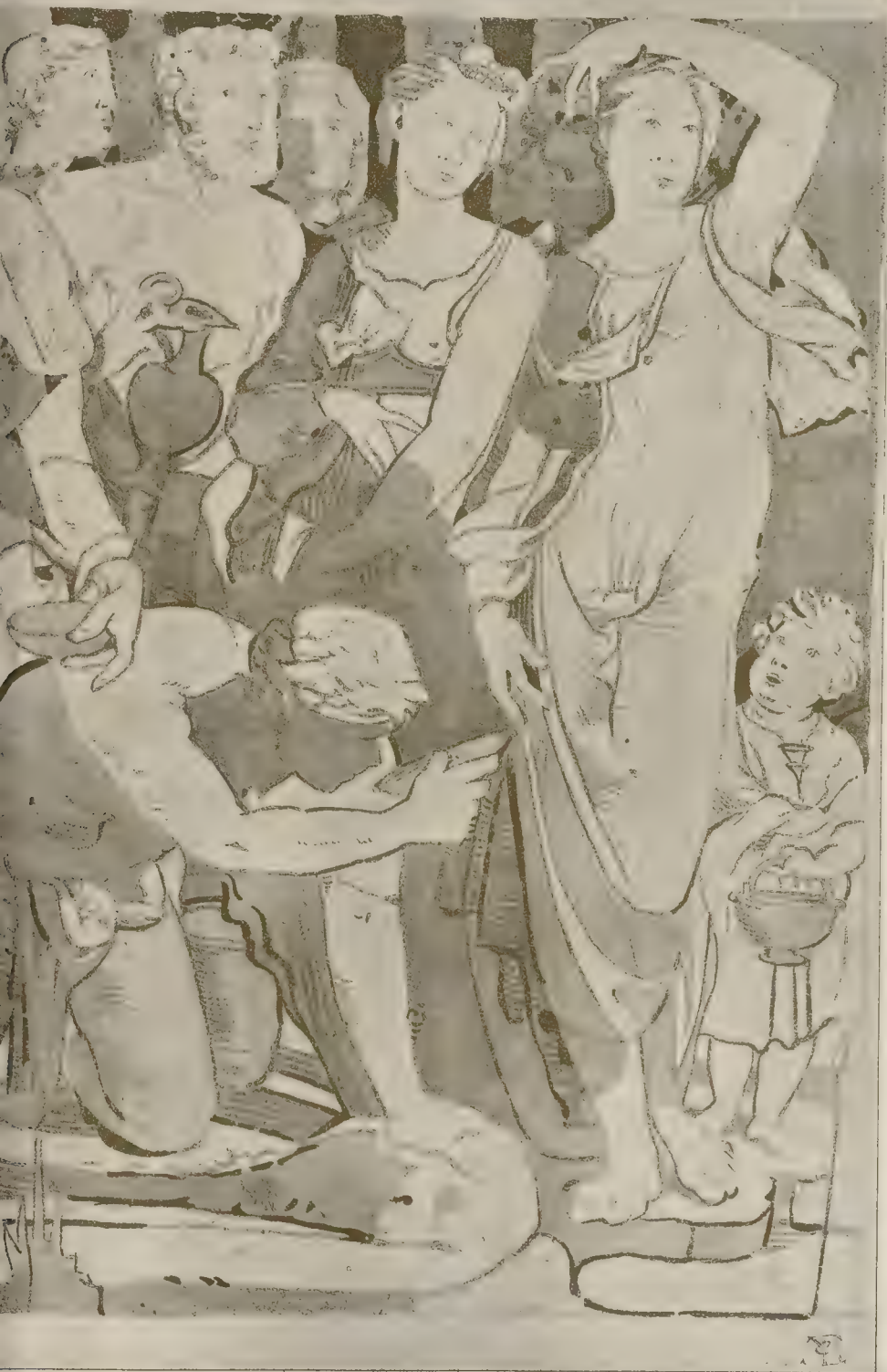
# SIENA CATHEDRAL. Marble Pavement



From "Moses striking the Rock"



1/4 full size



—FROM A DRAWING BY MR. T. MAC LAREN.





to the Duke of Lennox as a temporal lordship. In 1620 the Haddington portion of these lands was bought by the Earl of Haddington, and in the eighteenth century purchased by the first Earl of Hopetoun.

The church, which is of cruciform plan, with aisles in nave and choir, is of very considerable dimensions, measuring, internally, 197 ft. 9 in. from east to west, 55 ft. 2 in. across the nave or choir, and 105 ft. 6 in. across the transepts. Its area is, therefore, fully 12,000 superficial feet, or equal to St. Giles' Cathedral, Edinburgh. The choir is of four bays, the nave of five bays, with a central tower 90 ft. high over the crossing. The whole church,—nave, choir, crossing transepts, and aisles,—was vaulted.

It may seem strange that so large a parish church should have been erected here; but we must not forget that this church was founded by David I., "the saint sanct for the crown," for a royal chapel in his royal demesne, and was, we have every reason to believe, established in a manner befitting the munificent founder of many of the finest ecclesiastical edifices that even yet adorn our land.

The choir and transepts are in great measure ruinous, and the nave has been sadly knocked about to form a galleried church to accommodate the requisite number of parishioners. Besides the modern doors inserted in the nave aisle walls, the walls themselves have been raised about 3 ft. in the headroom in the gallery. A modern parapet has also been added. The nave aisle windows, on the north side, have had new tracery introduced, with the exception of the two-light window in the eastern bay, which has the old tracery partly restored. This tracery has cusping, of which more anon.

In the interior of the nave we find that the main arcade has been raised to admit the galleries. From the level of the top of the bases to the new work of the piers measures 8 ft. 8 in.; from the bases to the under-bed of the caps, 15 ft.; so that 6 ft. 4 in. of new work has been introduced. The difference of the old tooling from the modern is quite distinct even through the paint. The raising of the arcade has lifted the crowns of the arches above the level of the horizontal string course which crossed the vaulting shafts and returned along the west wall. This string course has been chipped away, but the line of it is distinctly visible about 8 ft. above the present level of the caps. The caps are painted to hide the red stone. The height of the vaulting shafts is unaltered, the caps being level with the caps of the tower piers. These caps have on the north side of the church occasional interesting sculptures.

Bearing with us these points and noting the style of the carving of the caps, and especially the moulding of the responds on the west wall, seen just above the gallery floor line, a comparison with the choir in its untouched state will simplify our reading of the history of the edifice, for there are no records extant in connexion with the church of pre-Reformation date to assist us. If we measure the pier at the junction of the nave-aisle and north transept we will find it to be 8 ft. 8 in. from the base to the cap, exactly corresponding with the height of the old piers in the nave. Turning to the piers of the choir arcade, we find that while the caps are level with those of the nave, the piers measure 8 ft. 11 in. from base to cap,—i.e., 3 in. more. We find here a strange thing,—these choir pier bases are 9 in. lower than the bases of the east piers of the tower. This is very awkwardly conspicuous at the responds on the tower piers.

The caps of the choir are of similar treatment to those of the nave; the arcade mouldings are identical; the string course and vaulting shafts follow the same design, although the caps of the vaulting shafts are varied. The return of the string course along the east wall is similar to that on the west wall of the nave. The responds on the east wall of the choir are identical with those on the west wall of the nave. All these points of resemblance in the interior are conclusive evidence of the nave and choir being of similar date. We will now consider the differences manifest on the exterior. The windows of the south aisle of the choir are gone, but there is no doubt they were similar to those of the north aisle. The clear-story lights, as well as the aisle lights, have cusping. It will be observed that the western window of the clear-story on both sides of the choir has caps in the jambs both within and without, while the other jambs have none. The east window has had its tracery and caps restored. As we pass along we observe that

there are many curious sculptures on panels, label-stops, and elsewhere all round the building. The only flying buttress remaining is attached to a buttress of the south choir aisle.

When we come to the nave, we find a great absence of cusping in the tracery. The clear-story windows of choir and nave are of similar design, but the nave windows are uncusped. These are undoubtedly original, although in some places they have been restored. The aisle windows are, however, entirely different from those of the choir. They are of three lights, with the exception of the window in the east-most bay in both aisles, which are of two lights and are identical with the choir windows. The two windows in the south aisle, adjoining that just mentioned, show the original design of the nave aisle windows, which were of three lights with cusped tracery. The remaining windows in the nave aisles, which are uncusped, are modern "restorations."

There are no remains of transept door, or south porch of the nave.

The buttresses of the nave are to a certain height similar to those of the choir and transepts, but their pinnacles are different. The nave buttresses show marks of having been rebuilt from certain varying heights, and the old pinnacles (sometimes miserably repaired) sit on above. Even these old pinnacles do not seem, on close examination, to be the original ones. The west angle buttresses of the nave are set square with the wall, not canted, as those of the choir and transepts, and as is usual in "Decorated" work. Owing to the alterations, there are no indications of flying buttresses observable in the nave. The tower is, perhaps, the most beautiful feature of the whole fabric, and one of the most graceful lanterns to be seen in stone or on paper. It is most likely, as was suggested by a writer some years ago, that the tower was originally finished with an open crown, somewhat after the manner of St. Giles', Edinburgh. The corbells on the cardinal faces of the tower lend probability to this idea, but owing to its ruinous state no further hints on the subject are left to us. The west doorway is formed of two semi-circular headed openings, with an enclosing semi-circular headed arch, with enrichment, supported on moulded jambs and central moulded shaft with fourteenth-century sculptured caps. On the cap of the central shaft there is carved a crown of thorns, with hands, feet, heart, and nails portrayed in relief. The doorway is a very superior piece of work to the somewhat coarse and clumsy window above it. The window is certainly of great dimensions, being 18 ft. wide.

We are now in a position to say that, notwithstanding natural differences in detail here and there, this church is practically of one date of erection. This we may affirm to be the fourteenth-century, after the burning of the buildings, in 1355, by the English. It may be observed that the nave is somewhat plainer in some portions than the choir,—notably in the clear-story windows where the tracery is uncusped, in the unmoulded jambs, &c., of the aisle windows, also in the interior where the walls above the arcade have been left rougher than in the choir. This may indicate that in the fourteenth century there may have been some lack of funds to prevent the design being completed in the fulness of the original intention.

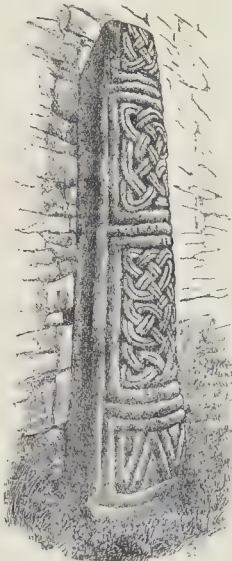
A word or two on the present condition of the remains. Notwithstanding the watchful supervision of H.M. Board of Works, it is highly desirable that something further should be done to keep the choir and tower from complete destruction. We cannot fail to notice a decided leaning of the whole choir arcade, east gable, and tower towards the east. This is gravely assisted by some of the piers of the choir being so much off the perpendicular. If these matters were looked to now, there is no reason to doubt the strength of the fabric to stand a roof, and thus be made to last for many generations.

"The Story of the Savoy."—In a "Note" last week we referred to an article bearing this title in the *English Illustrated Magazine* for the current month. We inadvertently attributed the sketches to Mr. Dewey—Bates, instead of to Mr. W. Harold Oakley.

Wesleyan Chapel and Schools, Kitteroad, Peckham.—Messrs. J. Jones & Sons, of 42, Farringdon-street, E.C., write to say that they have been entrusted with the order for the heating work, not the firm named by us last week.

#### THE CYLINDRICAL PILLAR AT LLANTWIT MAJOR.

At a meeting of the Cambrian Archaeological Association, held on Thursday evening, May 23, in the rooms of the British Archaeological Association, at 32, Sackville-street, the Ven. Archdeacon Thomas being in the chair, a paper was read by Mr. J. Romilly Allen, F.S.A. (Scot.), upon the cylindrical pillar, ornamented with interlaced work, at Llantwit Major, Glamorgan-shire. The paper was a sequel to one upon the inscribed crosses at the same place, published in the April number of the *Archæologia Cambrensis* for the present year. The author stated that the pillar stood in the churchyard against the north wall of the old western church. It was carved out of a single piece of sandstone 9 ft. long, of which 1 ft. 6 in. was buried beneath the ground, the remaining 7 ft. 6 in. being above the surface. The cross-section was, roughly speaking, a circle of 1 ft. 6 in. diameter at the bottom, but only 1 ft. 2 in. in diameter at the top, so that the form of the pillar was really a truncated cone. The peculiar feature in the pillar was a vertical groove of V-shaped section running the whole way down the back of the stone. The groove was 4½ in. wide and 3½ in. deep. It evidently formed part of the original design, because the ornament was arranged to suit it. The whole of the convex surface of the stone was covered with elaborate sculpture, consisting of three panels of interlaced work, and a sort of rude chevron pattern round the bottom. The interlaced work belonged to a class which might be called irregular broken plaitwork, which was intermediate between true plaitwork and knotwork.]



Cylindrical Pillar, Llantwit Major.

Mr. Allen said that most persons must be familiar with the appearance of regular plaitwork, composed of two series of parallel bands, cutting each other at right angles and lapping under and over alternately. The same kind of fabric could be produced either by the operation of plaiting or by that of weaving, the only difference being that in one case the bands, or threads, ran diagonally with regard to the margin, whilst in the other they were parallel to it. The author then explained how a piece of ornamental plaitwork was drawn practically, by first dividing the surface intended for decoration into squares like a chess-board, but placed diagonally with regard to the margin.

The pattern was then produced by drawing the bands over the setting-out lines, and leaving breaks where one band crossed over another. In the irregular broken plaitwork which occurred on many of the early sculptured stones in Wales and elsewhere, part of the plait was designed in the manner described, but in places variations were introduced by





Part of Pavement, Siena Cathedral.

cutting off a band and joining it up to the next one, or to the next but one, parallel to it, or at right angles to it, instead of allowing it to run straight on in the usual way. A break was thus made in different parts of the plait. Instances of this practice were mentioned as occurring upon the Cross of Samson, at Llantwit Major; upon the Cross of Eivdon, at Golden Grove, Carmarthenshire; and upon the cross at Carew, in Pembrokehire. Upon the pillar at Llantwit Major the breaks in the plait were made without any regard to symmetry, but when the breaks were made at regular intervals a decorative pattern was the result, as upon one of the other stones at Llantwit Major. Mr. Allen has endeavoured to show, in a paper on the "Analysis of Celtic Interlaced Ornament," in the "Proceedings of the Society of Antiquaries of Scotland," that knotwork, i.e., knots arranged in rows, and repeated over and over again,—was gradually evolved out of regular plaitwork in this manner.

The form of the Llantwit pillar was next commented upon. The groove at the back was a unique feature, of which this was the only known instance. The shafts of the pre-Norman crosses in Great Britain were usually rectangular in cross section, with two broad faces and two narrow ones, but they were seldom either square or round. There was only one other cross in Wales with a round shaft, namely, the pillar of Eliseg, near Valle Crucis Abbey. This belonged to a type found almost exclusively in the central and north-western counties of England, those at Stapleford, in Nottinghamshire, and Ilam, in Staffordshire, being good specimens. The shafts were round at the bottom but square at the top, each square face having a semi-circular termination where it dies away into the round. These pillars usually occurred in pairs, as at Gosforth, Penrith, and Beckermest St. Bridget, in Cumberland. Another type of pillar was round the whole way up, as at Wolverhampton and Masham, in Yorkshire. The Rev. Prof. G. F. Browne had discovered that the font at Wilne, in Derbyshire, was made out of one of these cylindrical pillars, the Saxon ornament being left, but turned upside down.

All these round pillars were of the Christian period, and had probably been surmounted by crosses. The Gosforth Cross still retained its cruciform top.

Mr. Allen concluded with a review of the various theories that had been advanced by different authors to explain the significance of the groove at the back of the Llantwit pillar. He referred to the description in Gibson's "Camden" where the "notable furrow" is compared to those produced by the weather on the Rollwright stones and others of the prehistoric period. Donovan, in his "Excursions through South Wales," has suggested that the groove "was designed for no other purpose than to admit the corner of a building, or some other kind of support." Mr. Allen thought that there might possibly have been a second pillar like the one now existing, and that a slab fitted into the grooves between the two. Mr. Worthington Smith's theory was that a wooden pole lay in the groove, and was surmounted by a cross, the pole being tied to the pillar.

## Illustrations.

### MARBLE PAVEMENT, SIENA CATHEDRAL.

**T**HIS celebrated pavement is a unique work. It is an inlay of dark grey marble upon a white ground, with outlines and shading in black lines, resembling niello. It was designed and executed by various artists in the fifteenth and early part of the sixteenth century. A great variety of scenes and figures are represented in different parts of the pavement. They are chiefly from scripture or from the history of the Jews, as recorded by Josephus, but include also such subjects as the Seven Ages of Man, symbolical figures of Religion and the Graces, figures of sibyls, and the symbols of Siena and the cities allied with her. The names of many of the artists employed are lost, but those of Antonio Federighi, Giuliano di Biagio, Vito di Marco, Urbano di Cortona, Bastiano di Francesco, and Beccafumi have been recorded. Some of the grandest compositions are the later ones by Beccafumi, from one of which—the "Moses Striking the Rock" Mr. MacLaren made the sketches which we reproduce in two double-page plates. The other plate is from a photograph of the pavement. From the inscription on the tablet in the typo-gravure it appears that the scene represented is the battle between Herod Antipas and Aretas, king of Arabia Petrea in which Herod was defeated and his army destroyed—a disaster which some of his subjects supposed to be a "judgment" for the murder of John the Baptist.† Josephus says the kings themselves did not fight, but sent their generals,—a circumstance represented in the picture, where the monarchs appear to defy each other at a distance, while the battle goes on between them. The city in the distance on the left is probably Jerusalem. The incident of the eagle defending her nest of young against a serpent doubtless refers to the chief cause of quarrel between the monarchs, which was the contemplated treachery of Herod towards his wife, who was the daughter of Aretas. The scene represented in the small illustration above is the battle between the Israelites under Jephthah and the Ammonites. In the foreground is the battle, while in the distance are represented the subsequent meeting between Jephthah and his daughter at the gates of Mizpeh, and his sacrifice of her in fulfilment of his vow. This scene was designed by Antonio Federighi, and executed by Bastiano di Francesco.

### "HISTOIRE DE L'HABITATION: PARIS EXHIBITION.

THESE sketches are from the series of models arranged, under the direction of M. Chas. Garnier, along the end of the Champ de Mars adjoining the river, and intended as an illustration of the history of the habitation.

\* These sketches were made by Mr. MacLaren during his tour as Gold Medalist and Travelling Student (1885-86) of the Royal Academy.

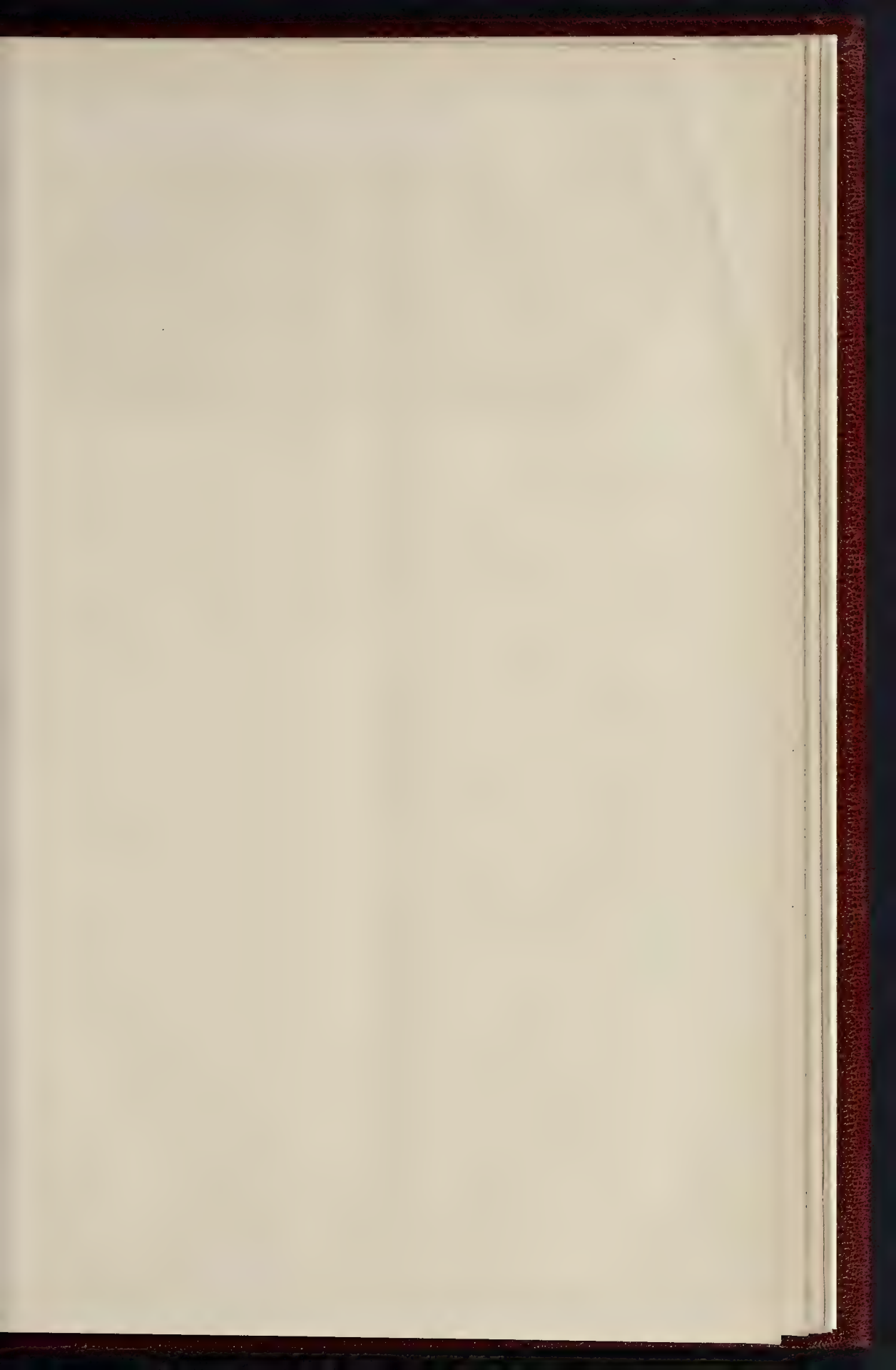
† Josephus, Antiquities, Book xviii., chap. v.

### THE PRINCE'S CLUB, KNIGHTSBRIDGE.

THE site of the old "Prince's Club," at Hans-place, Chelsea, being required for the rebuilding operations on Lord Cadogan's estate, that famous resort for the lovers of tennis and racquets has been transplanted to Knightsbridge, the aspect of which thoroughfare has greatly changed for the better during the last twenty years, what with the rebuilding of the cavalry barracks, and the enterprise of Mr. J. Charlton Humphreys, whose blocks of residential chambers and other buildings are among the most prominent features of the neighbourhood, although the existing buildings are becoming somewhat eclipsed by the lofty block now in course of erection by Messrs. J. W. Hobbs & Co., Limited, opposite Sloane-street, a block which overlooks Hyde Park on one side, and the height of which has already been reduced by the intervention of the First Commissioner of Works.

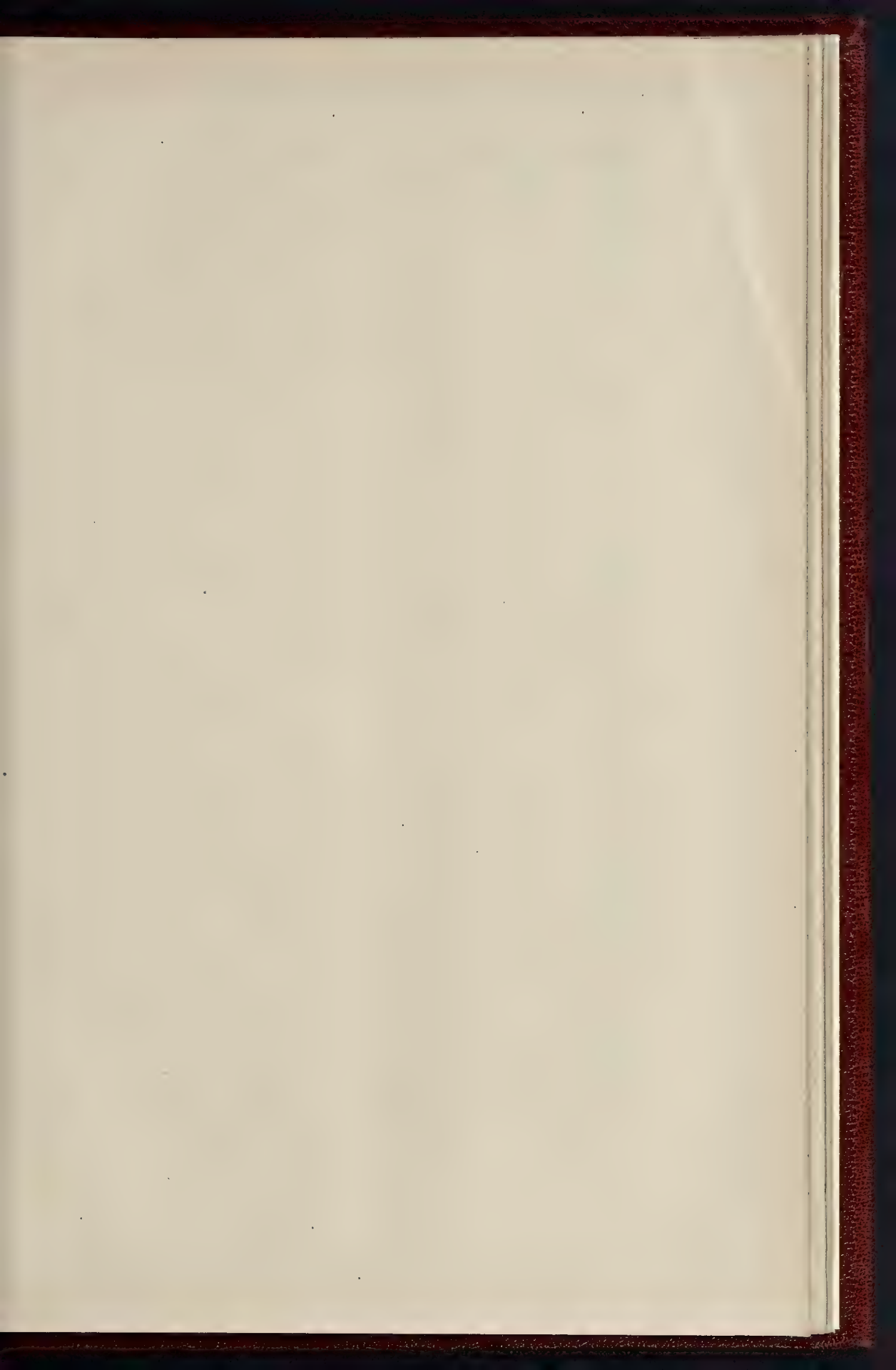
The new Prince's Club, opened the other day by the Prince of Wales, has been built on an area covering nearly two acres of ground, part of which was formerly the site of "Humphreys's Hall," where the "Japanese Village" was formed. The present entrance leads direct from the Knightsbridge-road into a hall embellished with Corinthian columns. From the hall one enters the "Oak Room," Elizabethan in character, and some 45 ft. square, having a finely-carved oak chimney-piece and a panelled oak dado running round to a height of some 10 ft., above which is hung richly-coloured tapestry. Overlooking the room is a music-gallery, from which a good view may be obtained of the coffered ceiling, designed by Mr. Donaldson. The tennis and two racquet Courts have been, as nearly as possible, copied from the courts of the old Club in Hans-place, under the superintendence of Charles Saunders, the Tennis Champion, and are stated by experts to be completely successful. The Courts are so arranged that from the Racquet Court Gallery play from all three Courts can be seen. A second Tennis Court and the Gymnasium are now being built. An exceptional feature in the Club is its Turkish Bath, which is, perhaps, the most elegant in London. This has been decorated with hand-painted and mosaic work of Pompeian character by Signor Marolda and a staff of Italian artists. There are also a number of hot and cold water baths, a Russian or vapour bath, needle, sitz, and other baths. The whole of these baths have been supplied by Mr. John Smeaton, of Great Queen-street, Lincoln's Inn-fields, who also arranged and planned the Turkish baths, which are heated and ventilated on his system. All the sanitary appliances, lavatories, water-closets, ventilation, and drainage, have also been carried out by Mr. Smeaton. There is a most luxurious plunge-bath, which is of a uniform depth of 5 ft. 2 in., and contains 7,000 gallons of water, and is inlaid with blue glass mosaic, bedded on a layer of Claridge's asphalt. The fittings of the plunge-bath are of buff brass, and the whole is stated to be from an old Roman copy. There is a well-appointed dining-room, 60 ft. square, part of which is occupied by a billiard-table. The building is lighted by electricity and ventilated on modern principles. A lease













PORTION OF THE PAVI

From





SIENA CATHEDRAL.

The Phototype Co., 303 Strand London.







Portion of Old Tower on Ludgate Hill, now being Demolished.

of nearly eighty years has been obtained, and the number of members is over 800. The Club has been built by Messrs. Peto Bros., from the designs of the architect, Mr. E. H. Bouchier, A.R.I.B.A., and the decorations and furnishing have been directed personally by a member of the Club, Mr. George Donaldson, some of the work being done by Messrs. Campbell, Smith, & Co. The electric lighting is by the United Electric Engineering Company, under the supervision of Major-General Webber, C.B. The two acquet-courts are paved with Claridge's asphalt, the total area being 3,630 ft. super. We are informed that the originator of the re-birth of the old institution known as "Prince's," is Mr. H. Hippisley Cox, the Vice-Chairman of the Club Company.

#### OLD TOWER ON LUDGATE-HILL.

The remains of the old tower shown in the accompanying illustration have been made use of *in situ* in building the block of houses now in course of demolition on the south side of Ludgate-hill, between St. Martin's-pur and Pilgrim-street. Our view is taken looking westward. The tower is near Pilgrim-street, where it has been visible for a long time, but very little noticed, even by people who have passed it every day. It formed the party-wall between Messrs. Cornack's premises and the adjoining house eastwards which formerly came out to the same line of frontage. It still constitutes the party-wall with the house that has been put back (a bonnet warehouse), for the old work extends from the Ludgate-hill front to the street in the rear, a distance of about 35 ft. It is 3 ft. thick, and perhaps 30 ft. high.

As one sees it from Ludgate-hill, it will be noticed to consist of rubble masonry, with squared quoinstones at the angle, also round what has been the opening for a window in the upper

part to the left, and still higher in a cornice or string-course. The structure was formerly an appendage to Ludgate, and may be considered to be more than six hundred years old, having been built, no doubt, together with a new City wall, about 1274, in the time of Edward I.

The following quotation from Lambert's "History of London" explains its origin clearly:—"In this year (1274) Robert Kilwarby, Archbishop of Canterbury, by licence from the Crown, founded the Convent of Blackfriars, which was built with the stones taken out of the ruins of the Tower of Mountfitchet, and from a part of the City wall pulled down to make way for the building. This produced an order from the King to the Citizens of London to build a new wall with a tower at the head of it for his reception, which wall was to run from Ludgate westward behind the houses to Fleet Ditch, and thence southward to the river Thames. For the completing of which new work his Majesty granted the City a duty on sundry merchandizes for the term of three years."

This new wall practically added to the City by enclosing a precinct about the size of an average London square, but the added area was not subject to the jurisdiction of the Lord Mayor. Part of this new wall can now be seen at the junction of Pilgrim-street and the Broadway, near which point it was connected with the Tower. Other portions of the same wall were removed about seven years ago, when Little Bridge-street was widened, but the foundations remain deep down under the north side of the same street.

Ludgate itself stood a little above the Old Bailey, and close to the west side of St. Martin's Church. In excavating the basement of Messrs. Pearce's premises (which are already rebuilding) some old stonework was uncovered, which very probably formed part of the Gate-building at a point where it joined on to King Edward's Tower.

W. S.

#### SANITATION AT CHELMSFORD.

THE Association of Public Sanitary Inspectors of Great Britain held their fourth annual provincial meeting on Saturday last, June 8, Chelmsford being this year the town selected for the meeting. A large party of the members left Liverpool-street Station at 9 o'clock, and their number was augmented by other members who joined the train at Stratford and other stations *en route*. Arriving at Chelmsford soon after 10 o'clock, they were cordially received by His Worship the Mayor of Chelmsford, Mr. Frederic Chancellor, F.R.I.B.A.\*

At eleven o'clock a meeting was held in an upper room of the Corn Exchange. The Mayor took the chair at the commencement of the proceedings, and, in the course of his introductory remarks, welcoming the members of the Association to Chelmsford, referred to the progress in sanitation which had been made by the town during the last thirty or forty years. He said that he was glad to see, not only in Chelmsford, but everywhere else, a general awakening to the importance of good drainage and efficient sanitation in all respects. Indeed, at the present time, the man who showed carelessness or indifference as to the sanitation of his house branded himself an outer barbarian, for in these days of luxury and comfort, when baths, lavatories, water-closets, and other conveniences were brought inside our houses, it was especially needful to see that the arrangements were safe. In that work the house-holder or house-owner was largely dependent upon the technical knowledge of the sanitary inspector, who should be a highly-trained and adequately-remunerated officer,—not a mere broken-down tradesman,—and a man not afraid of doing his duty (applause). Proceeding to refer to what had been done in Chelmsford, the Mayor said that within the last few years they had established a sewage-farm, which, however much it might be criticised, was, he believed, the only sewage-farm in the country which was worked at a profit. The accumulated profits of five years' working, after paying all expenses (exclusive of rent), amounted to about 1,000*l*. Having referred to the question of water supply, and to the care taken in maintaining and keeping clean the roads and foot-paths of the town, the Mayor vacated the chair, which was thereupon taken by Mr. Hugh Alexander, the Chairman of the Council of the Association.

Mr. Alexander, in the course of a short speech, referred to the growth of the Association, which now numbered about 400 members on its roll, exclusive of the membership of branch associations. In Manchester, Yorkshire, and other localities, similar but independent societies had been formed for promoting the same objects as those which the parent society had at heart. Letters regretting the inability of the writers to attend were received from Mr. W. J. Beadel, M.P., and other local Members of Parliament, as well as from Dr. Richardson, F.R.S., Mr. E. C. Robins, F.S.A., and other gentlemen.

The Hon. Secretary (Mr. B. C. Legg) read a letter from the Town Clerk of Folkestone, inviting the Association to hold a meeting there in September next. On the motion of Mr. Stace (Limehouse), seconded by Mr. Wootton (St. George's-in-the-East), it was resolved to accept the invitation with thanks.

Several new members having been elected, Dr. A. Downes, D.P.H.Camb., Local Government Board Inspector, and late Medical Officer of Health for the Chelmsford Union, gave an address on "Sanitation in Chelmsford." After a few prefatory remarks, he said that the population of the Urban Sanitary District of Chelmsford was, in 1881, just under 10,000 (9,885); probably at the present time it was a little over 10,000. It was not a fast-growing town. Its industries included implement works, breweries, maltings, &c. As to its geological position, the town was situated in a shallow valley just above the junction of two streams, the Cann and the Chelmer. Chelmsford proper was situate in the fork of the rivers; south of the Cann was Moulsham. The London clay, which was found over nearly the whole area of Essex, was at Chelmsford covered with from 10 ft. to 30 ft. of gravel. On the Moulsham side the gravel in its turn was capped by brick earth.

\* Chelmsford, although the county town, and a place of some antiquity, has only lately been incorporated, and the citizens elected Mr. Chancellor, the well-known architect, to be their first Mayor. Mr. Chancellor had previously rendered much good service to the town as Chairman of the Local Board, which has now been superseded by the Corporation.



With regard to sanitary administration generally, perhaps the most active sanitary inspector that this country had ever known was Cholera. In consequence of its appearance, in 1849 Mr. Edward Cresy, one of the Inspectors of the then General Board of Health, made a report on the sanitary condition of the town. As one result of Mr. Cresy's report, the old Local Board of Health was formed, and that Local Board, which did much for the town, continued to exist until last year, when the town was incorporated. One of the first things which the Local Board set about was the improvement of the water supply of the town. In 1853-4 an artesian well was sunk in Moulsham. It went to a depth of 568 ft., including 200 ft. in the chalk. The estimated yield of that well in 1866 was 90,000 gallons daily; at present it was estimated at 80,000 gallons. A supplementary shallow well which had also been made was closed in 1866, as the water from it was condemned by Dr. Buchanan when he made his inspection that year. In 1869, the old Burgess well, which had previously supplied the town conduit, was piped to the pumping station; its yield was about 70,000 gallons. The new scheme of supply, now in progress of completion, from the Admiral's Park well, would give, it was estimated, a yield of 100,000 gallons per day, so that there would then be a total yield of about 250,000 gallons per day, or twenty-five gallons per head of the population. Proceeding to speak of the geology of the water-supply, Dr. Downes said that the county of Essex was covered almost entirely by a coating of stiff blue tenacious clay (London clay), varying in thickness from about 20 ft. at Thaxted to 80 ft. at Halstead, 126 ft. at Braintree, 200 ft. at Chelmsford, and 450 ft. at Foulness. The artesian well at Moulsham was sunk right through the London clay to the Thanet beds, whence most of the water was probably obtained, and not from the chalk. The lower tertiary, to which the Thanet beds belonged, cropped out all round the fringe of the London clay, and the water falling on these outcrops percolated into the shallow saucer, so to speak, below the London clay, and was retained there under pressure. From the fact that the levels of the wells had fallen, and continued to fall, it was probably the case that they were pumping from an underground reservoir faster than the reservoir was supplied. It was a case of "pull baker, pull butcher," or, rather, of "pull brewer, pull Board," for he understood that an arrangement had been made that the brewers and the Board should not pump at the same time, or they would be pulling against each other. Analyses of the water from the Thanet beds showed it to be exceedingly soft. It contained scarcely any lime or magnesia, but there was a great deal of bicarbonate of soda and chloride of soda. It was a water which had very often been condemned as containing a great deal of free ammonia, but analysts now understood it better. The second source of water supply in Chelmsford was the drift gravel, whence the water from the Burgess well, and the water from the Admiral's Park well, was obtained. The water from that source was hard to the extent of 22 or 23 degs. of hardness, but its hardness could be reduced to 7 or 8 deg. by Clark's well-known process. In conclusion, Dr. Downes described the sewerage of Chelmsford, which was first undertaken by the Local Board in 1853. The sewage was at first pumped into the river, where it speedily became a nuisance. After some five years of this, filter tanks were constructed, the effluent being pumped into the river, and the solids being sold. The passing of the effluent into the river soon caused another nuisance, and about 1866 the sewage was pumped on to Barnes Farm, the lease of which expired in 1880, when the present Joint Sewage Farm, to which the sewage was conveyed by gravitation, was laid out. The carrying out of these works, and of paving, scavenging, and other auxiliaries, had done a great deal for the health of Chelmsford, and great credit was due to Mr. Pertwee, the Borough Surveyor, who had served the town most conscientiously and ably for about a quarter of a century, and to the Mayor, to whose zeal and energy for the good of the town was due all the best work of the last ten or fifteen years (applause). But owing to the presence of a mill-dam on the river, the subsoil water of the town was 5 ft. or 6 ft. nearer the surface of the ground than it ought to be, and that was a very serious thing for the health of the town. Sir Douglas Galton was of opinion that it was desirable to have at least 15 ft. of



dry subsoil under dwellings, but they had nothing like that in Chelmsford.

Dr. Tripe, in moving a vote of thanks to Dr. Downes for his interesting address, said that the town would do well to acquire the mill as speedily as possible, and to remove the mill-dam referred to, for by lowering the level of the subsoil water they would have less consumption, and generally less *malaise*, to contend with.

Alderman Duffield, in seconding the motion, humorously referred to the fact that the pecuniary success of the sewage farm was due to the fact that the produce grown was used in fattening calves.

Dr. Alfred Carpenter, J.P., Croydon, in a long speech moved the following resolution:—

"That this meeting desires to record its opinion that, in order to secure proper sanitary inspection, it is desirable that only properly qualified men should be appointed to the position of Sanitary Inspectors; and that such officers should be adequately remunerated and protected in the discharge of their duty, and not be discharged, nor their salaries diminished, without the sanction of the Local Government Board. The meeting also desires to express the opinion that all Sanitary Inspectors should be required by law periodically to inspect the district to which they are appointed, in order to detect the existence of nuisances, and in such cases to serve notices for the abatement of such nuisances,—which notices should be read at the next meeting of the Board or Committee appointed for such purpose, and, if approved, such notices should be valid, and proceedings taken thereon as occasion may require."

Mr. E. Lewis Thomas, M.A., hon. counsel to the Association, seconded the motion, and adduced arguments which strongly showed the necessity of protecting sanitary inspectors from being intimidated against the fearless and thorough discharge of their duties.

Dr. Major Greenwood, Dr. Tripe, and Mr. Wootton having spoken, the resolution was unanimously agreed to, and the Secretary was

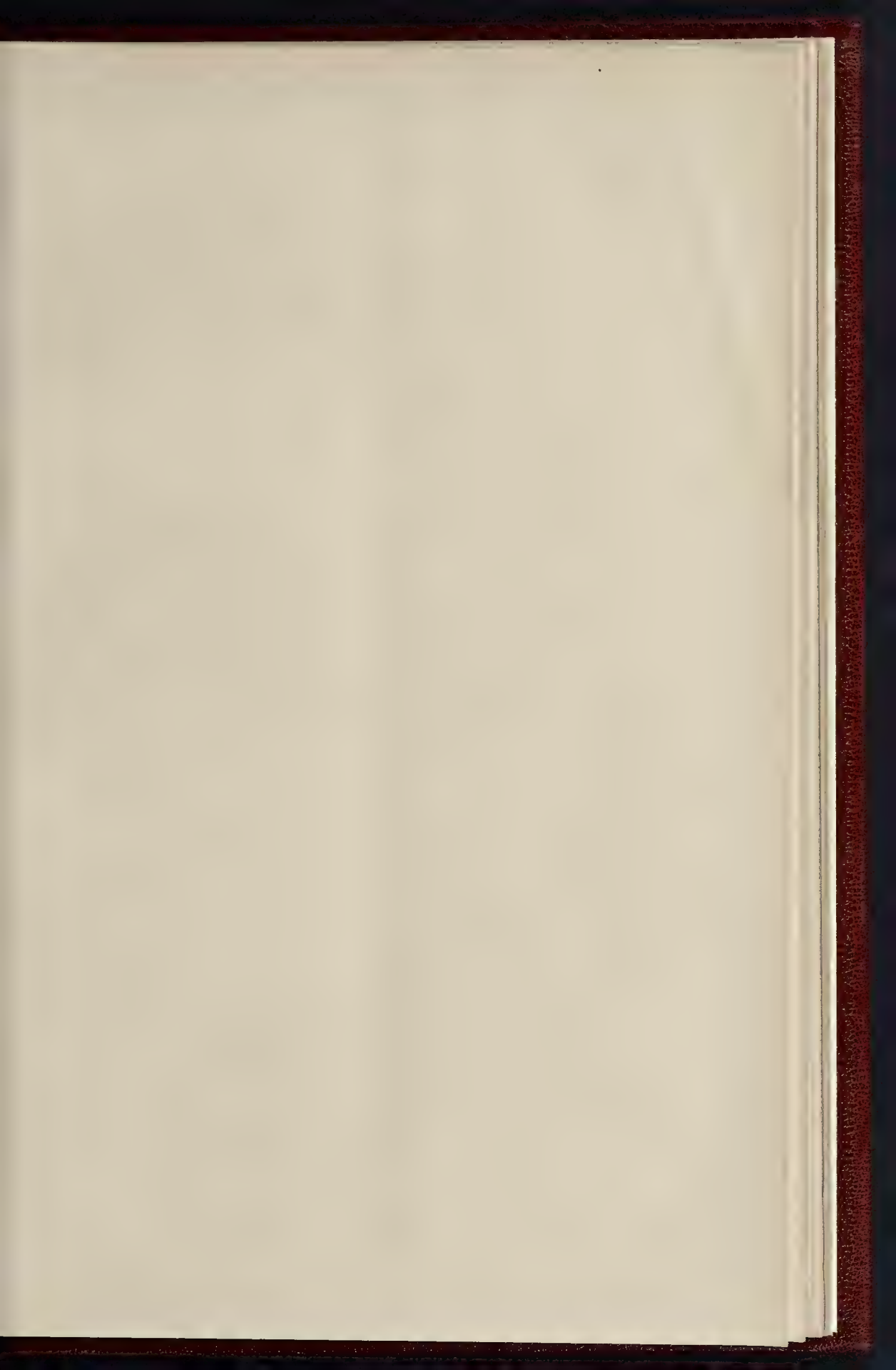
instructed to send a copy of it to the Local Government Board.

Votes of thanks having been passed to the Mayor, and to Mr. Alexander, the visitors adjourned to the Corn Exchange, where they were entertained at luncheon by the Mayor. After luncheon they drove to the new Union Buildings, now in course of erection. They are planned in detached blocks, on the pavilion principle, and the material used externally is red brick. The buildings are to replace those burnt down some time back. The architect (His Worship the Mayor) explained the sanitary arrangements, which are of a very complete character, the drains being laid outside the buildings in straight lines, with inspection manholes at frequent intervals. All soil waste, and lavatory pipes are tapped and disconnected. The builders are Messrs. Longley & Co., of Crawley, Sussex, Mr. A. W. Mitchell being clerk of the works.

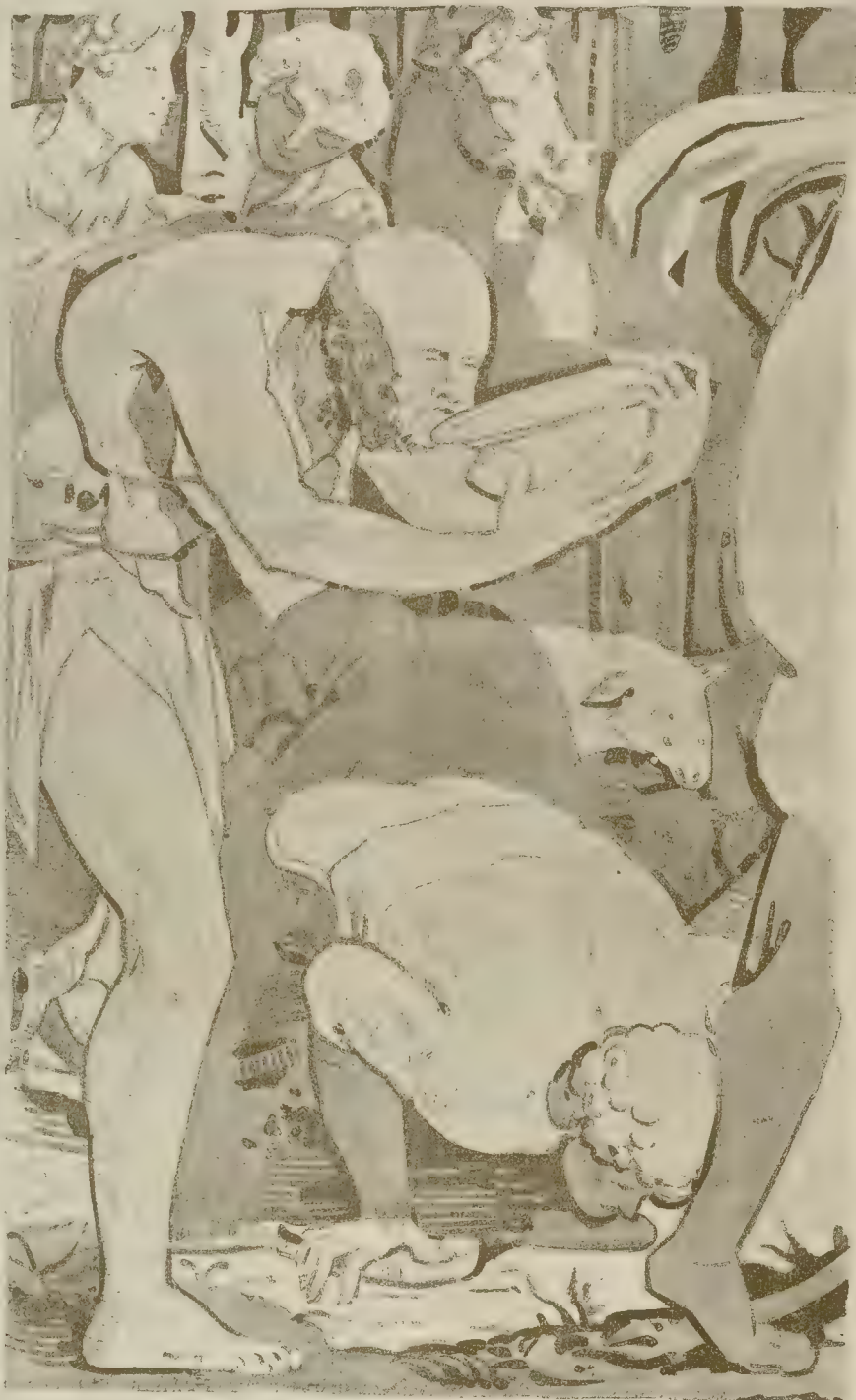
The party then visited the Baddow Water Tower, where Mr. C. Pertwee, the Borough Engineer, read the following short paper on the water supply and drainage scheme carried out by the Chelmsford Rural Sanitary Authority:—

"The Water Tower consists of a brick tower 25 ft. square, 70 ft. in height, surmounted with a cast-iron tank of the capacity of 40,000 gallons. The tower is situated on the Baddow road, about midway between the portions of Springfield and Great Baddow to be supplied with water, and at a level of 100-0 on Ordnance Survey, the highest ground to be supplied being at 141-0. The water is obtained from a surface spring just below the base of the tower, yielding about 90,000 gallons per diem, and is raised to the tank above by one of Crossley Bros 8 h.p. gas-engines, with 8 in. duplex ran-





SIENA CATHEDRAL. Marble Pavement



From "Moses striking the Rock"



1/4 full size









House at MAGNOLIA  
Mass.  
Arthur Hooper Doda  
Architect Boston



House of JAMAICA  
PLAIN  
Emm Wheelwright  
Architect Boston.

pumps, delivering 8,000 gallons per hour, when at work. The population supplied is about 2,500; the water is constantly on, and a quantity of from 35,000 to 40,000 gallons is daily pumped. Gas being charged at 4s. 6d. per 1,000 cubic feet, the cost of raising the water to the tank is at the rate of about 1½d. per 1,000 gallons. The water is distributed throughout the districts of Springfield and Great Baddow by means of 6 in., 5 in., 4 in., and 3 in. mains, coated with black varnish.

The drainage of the districts referred to is by means of stoneware pipe sewers connected with the main outfall sewer, conveying also the drainage of the Chelmsford Borough along the valley line of the Chelmer and Blackwater Canal to the Sewage Farm at Brook End, Springfield. In addition to the ventilators, some sixteen or eighteen automatic flushing-chambers are in constant use, for the purpose of cleansing and freeing the sewers from gas and impurities.

The cost of the purchase of site, spring, erection of tower, engine, and pumps, was about 3,500£; and of the water mains, 2,800£; the expenditure upon the system of drainage, apart from the outfall sewer, was about 5,400£. The works have been in operation since 1882, and the cost of repairs has been almost nil, or very trifling indeed.

The visitors next proceeded to the Sewage Farm, where Mr. Pertwee read the following paper:—

"The town was sewered in the year 1852. The sewers consist of 15 in., 12 in., 9 in., and 6 in. glazed stoneware pipes, laid so as to empty into the back-water of Moulham Mill, skirting King's Head Mead, at a level of 71·5 on the Ordnance Survey. The discharge having become a nuisance, a sewer was constructed to convey the sewage to the pumping station in Mildmay-

road, and at the same time a barrel-drain 2 ft. 3 in. by 2 ft., about ½ mile in length, was made, acting as a storm relief and elongated reservoir during night when the pumping ceased. This sewer communicated with the Chelmer and Blackwater Navigation just below the first lock. A piece of land was purchased, and settling-tanks constructed, into which the sewage was for some time pumped, the effluent reaching the Navigation, and the sludge, mixed with scavengers' rubbish, sold for agricultural use. This process having in time also become a nuisance, the sewage was leased in 1865 to Mr. F. Marriage, for fourteen years, at 30£ per annum, the Local Board laying the mains and pumping the sewage on to Barnes Farm, Springfield, where the lessee dealt with it by irrigation on arable and pasture lands. In 1880 the Rural Sanitary Authority being desirous of draining the adjoining villages of Springfield, Great Baddow, and Widdford, a joint scheme was agreed upon between the Urban and Rural Authorities for one common outfall sewer along the valley line, so as to receive by gravitation the whole of the tributary sewers throughout from a combined population of about 13,500. A farm comprising 108 acres was purchased at Brook End, Springfield, where receiving-tanks, distributing-carriers, and under-drains were constructed, and the land prepared for sewage irrigation. The main sewer, which is egg-shaped, 30 in. by 20 in., is 3,000 yards in length, has a gradient of 1 in 1,200, or about 4 ft. to a mile, with a velocity of 1·40 ft. per second, and an average daily discharge of about 300,000 gallons. At the terminus of the main sewer (the level being 69·60), screening-tanks in duplicate are constructed for the purpose of keeping back solid and flocculent matter, the sewage being conveyed to various portions of the land through underground stoneware pipe

carriers, with manhole-chambers and sluices for distributing the sewage to the surface land carriers whenever desired. About 9 acres of arable land adjoining the tanks were laid out into ten beds, and deeply drained two rods apart to receive the sewage by intermittent filtration, the remainder of the farm being generally levelled and laid out for irrigation in the usual way, for the cultivation of rye-grass, market-garden produce, osiers, and cereals. The total cost of the scheme, purchase of land, compensations, and preparation works, including the erection of a new covered farmstead, has been about £28,000, which amount was borrowed for a period of fifty years, and is being repaid by the two Authorities in proportion to their respective populations, the Corporation contributing eight-elevenths and the Rural Authority three-elevenths, as per agreement. The scheme has been in operation now since Michaelmas, 1882, a period of upwards of seven years, with the result that the town and neighbourhood have been relieved of all nuisance, and the farm has, in addition to paying working expenses, rates, tithes, and taxes, accumulated a sum of £1,000, a portion of which is used as working capital, and the balance carried to the credit of the rates."

Mr. Alderman Durrant, chairman of the Joint Sewage Committee, made some remarks about the work at the farm, as did Dr. Alfred Carpenter, who strongly urged that the sewage ought to go upon the land while still fresh. This was not so at Chelmsford on Saturday last was disagreeably evident to some of the visitors.

There was no time to visit the new water-works, but the following particulars of them, furnished by Mr. Pertwee, may be given here,—

"The inadequacy of the present water-supply of the borough has been long felt, and to meet the demand, after careful consideration of various other schemes, the works now in operation were determined upon. The present water-supply consists of about 80,000 gals., derived from an artesian well, and of about 70,000 gals. obtained from a surface spring known as the Burgess Well, thus giving 150,000 gals. per diem for a population of about 9,000. The water is either pumped direct into the mains, or into an underground reservoir situate at the top of Wood-street, on the southern side of, and about 150 ft. above, the main portion of the town. The district is divided into three areas, and the water is distributed in each for about four hours every day upon the intermittent system. Most of the mains and services have been in use upwards of thirty years, and being more or less defective, the leakage and waste is very considerable indeed. The proposed supplemental scheme provides for the renewal of the present mains and services generally, in connexion, of course, with additional mains, and comprises the acquisition of a powerful spring cropping out at Admiral's Park, on the north-western side of the parish. This spring is collected into a covered reservoir of the capacity of 175,000 gals., from which a 9 in. suction will be led to the pumps. The tower, which is 36 ft. square, is situate upon ground at a level of 112·0 (Ordnance Survey levels), and is carried up 70 ft. in height to receive a cast-iron tank to receive 80,000 gals. of water. The lower portions of the tower are arranged for the engine and pumps and engineer's house, the next floor being for engineers' workshop and as bedrooms. The engine-room will be fitted with Crossley Bros.' 12 h.p. gas engine, with 7½ diam. three-throw ram pumps, having 16 in. stroke, so as to raise 20,000 gals. per hour into the tank above. The water will be distributed throughout the district by means of the mains already referred to; and it is intended to keep up a constant service, a total supply of about twenty-eight gallons per head of the population being at command. The estimated cost of the works is as under, viz., purchase of spring, construction of reservoir, tower, tank engine and pumps, about 6,500£; and that of the mains, hydrants, valves, &c., 3,500£."

The majority of the visitors returned to town in the evening.

#### A GROUP OF COUNTRY HOUSES NEAR BOSTON, MASSACHUSETTS, U.S.A.\*

The four houses here illustrated are given as examples of the modern picturesque country house on a small scale, in the treatment of which, in a simple but effective manner, modern American architects have been often very successful.



### THE LIVERPOOL ARCHITECTURAL SOCIETY.

MR. EDMUND KIRBY, President of the Liverpool Architectural Society, in his address recently delivered at the annual general meeting of that Society said:—

Last year, in addressing myself to the members of our Society, I strongly urged upon their serious attention the desirability of affiliating the Liverpool Architectural Society with the Royal Institute of British Architects. At our general meeting, held last month, a resolution embodying this scheme was carried unanimously, and later on our Secretary received from the Institute the pleasant notification of the adoption of our affiliation. Apart from the reasons already given as to the advantages of this step, practical ones have arisen which must at once appeal to us as important gains to our Society.

Directly the affiliation took place, the Council of the Institute acted promptly in showing its recognition of our relationship by nominating your president to be on its Council, and two members of the Liverpool Architectural Society to serve on two important committees of the Royal Institute.

I mention these facts, as they clearly point out to us that this affiliation has already become not merely a name, but a reality, in the endeavour to give us, besides a share in the advantages of union, a voice and a vote in the central government. I have not a doubt but this beginning will go on developing still further, bringing us in closer touch not only with our brethren in London, but with the profession generally throughout the Empire.

Our own Society has just revised its rules, and after their close discussion at two special meetings, they have been adopted as now printed. I am sure all the changes which have been made have been introduced for the benefit and well-being of the Society; and I am certain that although, naturally, some may have objections to one or two of the alterations, still, we all, as friends of the common weal, will do our best to carry out these new rules in their full intendment.

It will not be out of place here to mention the obligation which the Society is under to its honorary solicitor, Mr. Richard Cleaver, for the help, skill, and attention he has so kindly given in guiding through, in a clear, business-like manner, the various stages of framing these new rules which have lately come into operation.

Any review of the past session would be incomplete without reference to the Art Congress held in Liverpool during the autumn of last year. Amongst the subjects lectured upon in relation to art, papers of much architectural interest were delivered by Messrs. G. Aitchison, A.R.A., T. G. Jackson, H. H. Statham, H. Sumners, E. Warren, &c., evoking interesting and animated discussions, and for full accounts of which I was about to refer you to the official report of the Congress, but although it was understood that copies of the proceedings were going to be issued shortly after the completion of the Congress, I am surprised to find that up to this period no sign of their being published has yet come within anybody's knowledge.

Early this year, under the auspices of the Royal Institute of British Architects, the Examination in Architecture took place at the Royal Institution in this town, and gentlemen came from various parts of the country and from Ireland to present themselves for the examination.

I must congratulate the Society on possessing amongst its member gentlemen who, although very much engaged with their ordinary business duties, cheerfully undertook to devote their experience, knowledge, and time to conduct the examination of the younger members of the profession. Foremost amongst those who served on the Board of Examiners, their secretary, Mr. Culshaw, must again be thanked for the thorough and efficient manner in which he carried out the administration of an onerous and sometimes thankless office. I say he again must be thanked, for a little while since the Institute recognised in a vote of thanks their appreciation of Mr. Culshaw's services.

There can be no doubt that these examinations are of the greatest importance to the youth of the profession, and, if my words carried weight, I should strongly advise our younger members to make up their minds to immediately prepare themselves for an attack on the next examination papers, which, if at first not successfully overcome, will form an

excellent preparation for a second and, I hope, more victorious encounter.

But how is this to be accomplished? By at once obtaining and studying past examination papers, and also the useful guides published to these examinations by the Manchester Society of Architects. For those who are junior students, the new preliminary examinations of the Institute will be found to be an excellent and more elementary introduction to the advanced examination.

Students are reminded also of the advantages they enjoy in being located in a town in which there has been established one of the finest architectural libraries in the world, and where, on intimation to the librarian of their intention to study for examination, every facility will be afforded them for that purpose. For convenience of reference, our own library is to remain in its present position, and although it is not stocked numerously, it has attached to it the privileges attendant to a lending library. . . .

As regards Parliamentary work, you will have observed that the Registration Bill has this year again been brought before Parliament. It is similar to the one that was before the House last session, and practically the same arguments against the Bill are as forcible this year as they were last; and your Council, after discussing the matter, have again decided to support the Royal Institute in its opposition to the provisions of the Bill as they at present stand before Parliament.

Another Bill in which we as citizens, as well as professional men, are much interested has just passed the House of Commons. It contains several new regulations with reference to buildings. To one, Clause 41, I must call your particular attention:—

"Whenever any open space has been provided in connexion with any dwelling-house, whether before or after the passing of this Act, it shall not be lawful, without the consent of the Corporation, to make any alteration in such house, or in such open space, or in any back street, or passage, or open space adjoining thereto, or in the line of the opposite property; or to construct, erect, or raise any building or structure on such space, or street, or passage, or to diminish the area or the distance across the same to less than the area or the distance across herein prescribed, &c."

From this you will perceive the sweeping character of the clause; and what is of importance for us to observe is that its force not only applies to the future but is also retrospective.

Signs are showing that the building trade in Liverpool is in an improving condition. Excepting the Royal Infirmary, the new buildings in course of erection or in contemplation will not involve contracts of very large extent, still the new works now in hand, though not more than of ordinary dimensions, form in the aggregate an amount of work which will cause a considerable expenditure of money throughout the community.

On purely professional matters, I should have wished to have introduced the question of the increased responsibilities of valuers, and of the present state of the fees which cover that responsibility, but time will merely allow me to point to this as a hint which had better be thrown out for the future deliberations of the Council.

**St. Andrew's Hall, Glasgow.**—The past brief career of St. Andrew's Halls, Glasgow, has been a very discouraging one financially. The pile, which stands about midway between the Royal Exchange and the site of last year's Exhibition, covers an area of 5,792 square yards, and consists of grand hall, ballroom suite, and numerous smaller halls. At present St. Andrew's grand hall is the only available place for a large political or other meeting within the city. Unfortunately, however, the building has never paid its expenses, and the proprietary (a syndicate of Glasgow gentlemen formed sixteen years ago from semi-philanthropic motives), tired of their annually-recurring deficit of 500*l.* or thereabouts, have just decided to throw the building on the property market. It is stated that two years ago St. Andrew's Halls were offered to the Corporation privately for less than half the sunken capital,—the gross outlay slightly exceeded 100,000*l.*—but, probably owing to the cost of Municipal Buildings, no motion at all was made towards closing with that offer. Final announcement of open sale was made a few days ago, and the fate of the structure, in which the citizens are now at the eleventh hour taking some rather anxious interest, is bound to be pronounced one way or other very soon.

### "GEOMETRICAL PROPORTIONS."

SIR,—Will you permit me to make a few humble, and I am afraid somewhat discursive, remarks upon the discussion which has arisen in your columns out of the paper which was read by Mr. D. J. Blow upon this question of geometrical proportions, and their application by the monastic architects of the Middle Ages?

I am quite with you, Sir, as to the logical incubency of the advocates of a theory to adduce proofs in support of their contention; and in default of these, we are necessarily obliged to confine ourselves to generalities in endeavouring to prove that the theories advanced are not sufficiently supported by arguments and facts to be safely adopted and made our own.

In such a theory as that under discussion we are confronted with two sorts of evidence: (a) the direct and (b) the indirect, or circumstantial evidence.

The former is undoubtedly the most forcible, and consists in this case of literary or mechanical proofs of the employment of geometrical principles. I fully admit the great difficulty under which the advocates of such a theory labour, whilst they are endeavouring to discover documentary evidence. Yet there are original drawings of Medieval architecture extant (that of St. Pierre, Louvain, can be seen in the Hôtel de Ville there); and it is, to say the least, somewhat noteworthy, if geometrical principles were employed, that some evidence of it does not exist upon the drawings; for it must be remembered that these drawings were usually made on vellum, a substance that does not admit of an easy erasure. Then, again, that extremely interesting drawing-book of Willars de Honecourt, so lucidly described by Mr. Pite in your last issue, is surely a strong piece of—if I may use the term,—negative evidence. One more reference to the work of any Medieval writer which leads one to the belief that geometrical principles were extensively employed in the designing of the cathedrals of the Middle Ages? I use the word "extensively" advisedly, because the system could not very well have been adopted simply in isolated cases; the Medieval architects and builders were bound together by far too close a tie for that to happen. I would courteously venture to urge upon a gentleman so deeply versed in the lore of Medievalism as is Mr. William White, the propriety of supporting the theory which he champions by some literary evidence, if he wishes to bring his contention within the range of a practical discussion, and to also try and account for the apparent dearth of tradition upon a subject of such vast importance to the world during the Middle Ages.

The indirect or circumstantial evidence consists of the result shown by careful analyses of buildings with the view of determining what relations exist between commensurable dimensions and superfluous, as, for instance, the diagram published in your issue of May 25, by Mr. D. J. Blow. This particular example is, however, I venture to think, of very little practical utility in its present form, from the fact that it lacks what is very necessary to the proving of Mr. Blow's contention, viz.,—the exact measurements of the various dimensions which he uses in his diagram. I would ask the Travelling Student to be kind enough to furnish us with these, so that we may be enabled to judge whether the different lengths, breadths, and heights are absolutely, or only approximately, correct. If these are satisfactory, and if the extension to the remainder of the cathedral of the ordinal to which Mr. Blow has subjected the choir, prove to be equally satisfactory, I, for one, shall be prepared to admit that geometrical principles were employed in the designing, not of Gothic architecture, but of Reouvaix Cathedral.

Meanwhile, Sir, I think I am justified in holding to my opinion that the reduction of the art of architectural composition to the level of a mathematical problem is not only utterly subversive of the true principles of design, but also quite unwarranted by historical evidence, and founded, as the logicians would say, upon altogether insufficient premises.

OWEN FLEMING.

London, June 8.

### ROYAL ACADEMY STUDENTS' CLUB.

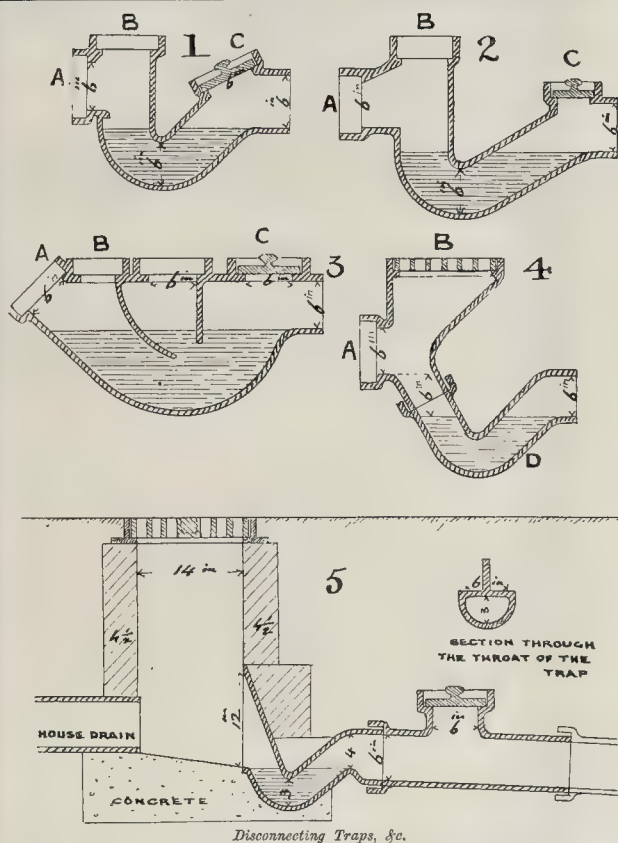
SIR,—Will you permit me, through your columns, to call the attention of past and present Academy students to this Club, which is in course of formation?

A provisional committee has been elected, and circulars are being sent out to all students, but the difficulty of obtaining accurate addresses after the lapse of several years is very great, and we therefore hope that any students who have not been communicated with will apply at once to the undersigned.

About forty Academicians and Associates have already promised to become members, and it is hoped that at least 400 students will apply for membership before the general meeting of subscribers, which is to be held at the end of this month.

ROBERT S. LOVELL, Hon. Sec.  
R.A. Schools, Burlington House, W.,  
June 12.





Disconnecting Traps, &amp;c.

## The Student's Column.

## TOWN DRAINAGE.

## XXIV.—SPECIAL TRAPS: "DISCONNECTING" AND OTHERS.

HERE are different forms of traps for disconnecting the air of sewers from that of house-drains, and for other purposes. We have before shown a few conventional forms; those annexed are improvements in details. It is important to have these details of the best form; they cost no more, and are more satisfactory, working efficiently without attention. Some of these, however, are better than others in this respect. A few remarks will be sufficient to indicate the qualities of those shown in the figures 1 to 5.

No. 1 is Doulton & Co.'s "Improved Sewer-gas Interceptor." The inlet socket A, as drawn, is intended to receive a drain-pipe, 6 in. internal diameter, the air inlet B being of the same diameter. It should be larger, and the manufacturers can easily make it so. In this case, it should be enlarged to 12 in., or at least to 9 in. diameter, as it ought to be, for a 6 in. drain. It is closed with an earthenware stopper, put in with common mortar, not cement, so that when it is necessary to remove it, that can be done without breaking the socket of the pipe, as common mortar does not set hard in damp ground, while it keeps the stopper sufficiently air-tight as long as it is required to remain there.

No. 2 is Mr. W. P. Buchan's "Patent Trap," made by Messrs. J. and W. Craig. It has a drop of 3 in. from the bottom of the pipe to the surface of the water in the trap. Its air inlet is only 6 in. diameter, same as Doulton's, but the makers are willing to enlarge it. The outlet C is 4 in. diameter. This, perhaps, also may be without objection made 6 in. for a 6 in. drain.

No. 3 is Messrs. Jas. Stiff & Sons' "Registered Intercepting Sewer-air Trap." It receives the drain-pipe obliquely, at an angle of about 45 degs., by the inlet A, a curved midfeather directing the current towards the outlet when the rush of water is sufficient to reach it with any force. As drawn, its air-inlet is only 4 in. diameter, too small. The middle inlet, 6 in. diameter, is for surface-water or house-waste. The air outlet is 6 in. diameter for a 6 in. drain.

No. 4 is Mr. S. S. Hellyer's "Ventilating Drain Syphon and Sewer Interceptor." Its air inlet is of considerable dimensions in one direction,—that shown in the section,—but crosswise it is reduced to the width of the pipe. The trap in the part marked D is of smaller size than the drain itself, being for a 6 in. drain about 4 in. diameter, thus preventing any sediment forming in the trap, and also ensuring that the water in the trap be wholly renewed more frequently than it is in traps which are of the same size in the throat as elsewhere. There is a vertical drop of 6 in. from the bottom of the drain to the level of the water in the trap.

No. 5 is Messrs. William Ingham & Sons' quick-motion trap. Its obstruction to the flow of sewage through it is less than it is in other traps,—inasmuch as there is no unnecessary and useless sinking of the sides of the orifice below the water-level. The top of the trap, crosswise, is straight and horizontal, parallel with the surface of the water in the trap. Its dip is, therefore, fully effective the whole width of the drain-pipe, and not, as is the case in all round sections, effective only at one central point while both sides dip uselessly into the water and offer unnecessary obstruction to the flow of sewage. The reports of the experience of the use of these traps are all favourable, and when we examine the principles on which they are constructed there appears every reason why that should be so. The trap effectually bars the passage of air; its dip is the same as that of other traps, about 2 in., or 2½ in.,

and this is effectively disposed; while the bottom of the trap is not sunk more than 5 or 5½ in. below the bottom of the drain, instead of 8 in. or 8½ in. The body of water in the trap being small, is wholly renewed frequently. The outlet is on the next adjoining pipe, not on the trap itself. This may likewise be so with the trap No. 4, although not shown in the figure. It is one of the points of this trap that when the sewage leaves it, it falls immediately and freely over the lip into the pipe and acquires motion thereby to start with, and a free outlet in the trap is maintained.

A trap which is found very useful in situations liable to back water from the sewer, as in deep cellars, is Mr. Jennings's "Combined Yard and Tidal Trap," which has an india-rubber ball, letting sewage pass outwards, but closing against back pressure.

## Books.

*Experimental Mechanics. A Course of Lectures delivered at the Royal College of Science for Ireland.* By SIR ROBERT STAWELL BALL, LL.D., F.R.S., Astronomer-Royal of Ireland, &c. London and New York: Macmillan & Co.

THIS is an admirable work, the subjects well chosen, the matter sound, and the style pleasant,—excellences that might be expected from the genial and accomplished Irish Astronomer-Royal. The book owes its birth to a course of lectures which Sir Robert Ball delivered in Dublin a few years ago to an evening class. The lectures were illustrated by apparatus, and a leading feature in the work under notice is the series of engravings illustrating the "properties" with which the author pointed his moral and adorned his tale. We may remark, in passing, that the same lines have been followed as those upon which Professor Willis has planned his system of apparatus designed for like purposes.

The book opens appropriately with a chapter on "The Composition of Forces." The first apparatus illustrated consists of two balls, attached one to each end of a cord, the bight of which is passed over a couple of pulleys. As the balls are of equal weight, this arrangement demonstrates an equilibrium of two forces. The equilibrium of three forces is explained by means of two equal weights arranged and suspended in the same way, but having another weight, representing the third force, attached by a second cord to the bight of the first cord. The apparatus is arranged in such a way that a black-board or slate can be placed at the back of the strings, which may therefore coincide with a diagram illustrating the theory of the composition of these forces. Nothing could be better devised than this method of impressing upon the beginner the relation between a geometrical diagram and the actual physical condition of the fact it illustrates. Were such methods more often followed, graphic presentation, which is so delightfully simple when the mind is once accustomed to its use, would be far oftener employed than it is at present. Many practical examples are also given by which the reader is familiarised with these elementary principles. The second chapter is on the resolution of forces, the action of the wind upon the sails of a vessel affording a striking and familiar illustration. A chapter on parallel forces follows, and we then get to the section which treats of the force of gravity. The familiar illustrations and parallels by which the various phenomena are described are given with a clearness and simplicity that is characteristic of the whole work, and will cause quite a new light to be thrown upon many familiar facts to which the student would probably never have attached sufficient importance, from the very fact of their familiarity. The determination of the centre of gravity of a mass, and the descriptions of stable, unstable, and neutral equilibrium, are good examples. A phenomenon that will be of especial interest to those who have ever been engaged in the designing of high-speed engines is presented by means of an apparatus causing a heavy disc to revolve with greater or less rapidity. The centre of gravity of the disc can be altered, and the vibration set up when the centres of gravity and rotation do not coincide, is emphasised by the ringing of a bell. We have noticed lately the same principle made use of by some engineering firms for regulating wood-working machinery



designed for running at high speeds, or turning machinery, such as that for milling plants, where extreme accuracy in all parts is imperative. A somewhat similar device has recently been taken advantage of for balancing car-wheels, to the great comfort of those railway passengers whose nerves may be as sensitive to vibration as the little bell in Dr. Ball's apparatus. It is such examples as this which show how much the industrial arts may owe to scientific speculation, and how the old rule-of-thumb era must pass away before the more enlightened procedure of the happily dawning age of trained intelligence.

The "Force of Friction" is treated of in Lecture V. This most important and often most disturbing factor in the determination of machine design has become more manageable lately in consequence of the labours of the Research Committee on friction appointed by the Council of the Institution of Mechanical Engineers. Of course, Sir R. Ball, who only deals in this book with first principles, does not touch on the details brought forward by the committee, but the underlying facts are better worth studying now that we have a superstructure of application which we can rear upon them. For this reason we specially recommend the chapter under consideration to the attention of engineers-students. We are glad to notice the author exposes the popular fallacy that the co-efficient of friction always equals the tangent of the angle of friction,—a most pernicious heresy, as the student may at times find, if he attempt to apply it to practical work.

A long chapter on ordinary pulleys, differential and epicycloidal pulleys, follows; in the course of which are given the results of some useful experiments as to the power required to work such devices. The lever is next attacked. Levers of the three orders are described, and simple illustrations given; the connection between the principles laid down in this connection and those bearing on parallel forces, previously dealt with, is brought out in an instructive manner. This practice of combining information, or, as it were, clinching, the instruction previously given by fresh examples, is extremely valuable, and adds greatly to the permanent value the student is likely to gain from the book, as well as increasing his interest in the work.

The inclined plane, which includes the screw, is the next subject, and after this, practical examples of the principles laid down are considered. Amongst these are the screw-jack, wheel and axle, wheel and pinion, differential pulley, crane, &c.

We now pass to a fresh section of the work, in which the fundamental laws already dealt with are combined and worked out in more complex forms. The mechanical properties of timber first receive attention, and illustrations are given by means of which the facts are explained. This brings the author to the condition of wooden beams subject to stress, and their relative strengths when of different sections and loaded in different ways. The principles of framework naturally grow out of this subject, and here the practical constructor, who has hitherto given little thought to the more abstract side of his calling, may find many familiar devices logically accounted for. Bridges next occupy attention, the mechanical principles governing the design of various types being considered, and we then pass to another section of the book.

The action of forces in the production of motion next challenges the student's attention. We would gladly follow the author in his many clever explanations and illustrations, by which the various kinetic laws are made plain, but to do so would be manifestly beyond the scope of our present task. We can only mention the subjects discussed, and refer our readers to the work itself. The first law of motion,—i.e., if no force act upon a body, it will, if at rest, remain for ever at rest; or, if in motion, it will continue for ever to move with a uniform velocity,—is illustrated by Attwood's machine, of which there is a good engraving. That a heavy body will occupy the same time as a light body in falling through a given space, putting the resistance of the atmosphere on one side—a disturbing condition which the author might have called attention to earlier,—is, of course, a simple matter of fact to the physicist, although there are a great many persons who would be incredulous of the truth of the law until they were convinced by Dr. Ball's simple, yet conclusive, experiments. That the action of gravity is independent of

the motion of the body is another truism to the man of science, which the ordinary untrained intelligence might find it still more difficult to grasp without the aid of the author's beautifully simple expositions. We can speak with some sort of authority in this case, as we once spent the best part of half-an-hour vainly trying to convince an artilleryman that the projectile from his piece would reach the surface of the sea exactly at the same time were it fired out by gunpowder in the usual way or were it simply allowed to roll out and drop vertically to the water; supposing of course the piece were pointed horizontally. Had we then had Dr. Ball's experiments to fall back upon our efforts would doubtless have been more successful. That the path of a projectile is a parabola the lay mind will perhaps be more ready to allow, having previously formed no opinion upon the subject; but if there are doubts they will soon be expelled by the illustration selected; which, by the way, affords another excellent combination of black-board diagram and working experiment. Inertia and the storage of energy are subjects rich in illustration by means of familiar objects, such as the hammer, fly-wheel, punching-machine, &c. The nature of circular motion has a chapter devoted to it, the action of circular motion upon liquids being shown by some very pretty lantern experiments.

The remaining part of the book is occupied by a short treatise on the pendulum and its application to clockwork.

We are pleased to recommend this book for the use of students, and more especially to the fathers of sons who show an aptitude for mechanical studies. At the same time, there is much in it that those of more advanced age may follow with advantage.

*Mirabilia Urbis Romæ: The Marvels of Rome, or a Picture of the Golden City.* An English Version, &c. By FRANCIS MORGAN NICHOLS. (London: Ellis & Elvey. Rome: Spithoever. 1889.)

MESSRS. ELLIS & ELVEY have done us all a good turn by reproducing for the first time in English this curious and interesting book. For curious and interesting it cannot fail to be to all who have visited or are intending to visit the "Golden City."

Written by an unknown author before the middle of the twelfth century, it became "the standard guide-book of the more learned visitors to Rome from the twelfth to the fifteenth century." What might be said of it now by the more learned visitors to Rome it is not difficult to imagine. Yet the charm of the writer's faith, that "sancta simplicitas" so natural to him, so difficult for us moderns to appreciate, will, we think, make his book in its English clothing a popular one. For there are still some who, in spite of the facts or theories of Professors Darwin and Huxley, can find a charm in the poetry of legend, and in the simplicity of an age of faith.

The book consists of several parts. After the interesting preface comes the main body of the work, the "Mirabilia, or the Marvels of Rome." Beginning his history with the foundation of the city by Noah and his sons, who left Asia after the building of the Tower of Confusion, the author takes us for a peregrination round Rome, describing the origin of its various monuments and the virtues of its various saints, and he concludes with the hope that his book will bring back the magnificence of the Golden City to the remembrance of mankind.

Of the five divisions which follow the Mirabilia, the first and second are perhaps of most interest. "The marvels of the Roman churches" might well make even Dr. Wace a sceptic; while the impression made by Rome upon Benjamin of Tudela, a Hebrew traveller, A.D. 1170, cannot fail to interest every reader. The book is prettily bound, and printed with a frontispiece representing part of the bronze door of St. Peter's, and with a facsimile of a map of Rome drawn about the year 1475, placed before the index. It is interesting to compare this map with Wolgemut's picture in the "Nuremberg Chronicle," printed in 1493. The map is decidedly more correct than the picture. All readers will, we hope, find a charm in the revelation of the childlike simplicity with which a learned traveller of the twelfth century regarded the wonders and miracles which in our author's day added a personal interest to every monument, whether pagan or Christian. Certainly in those

days all things were possible to him that believed.

*Aid to Survey Practice.* By LOWIS D'A JACKSON, Assoc. M. Inst. C.E. London: Crosby Lockwood & Son. Second edition, enlarged. 1889.

THIS book claims to contain a record of observed facts, habits, customs, events, methods, thoughts, and ideas which have occurred to the author at different times, and states that it is not a compilation from other books. It also contains tables, illustrations, and records for reference in surveying and setting out, and in route-surveys of travellers by land and sea. The plates illustrating the surveys are neatly produced, and possess the advantage of having been mostly executed by the author at various times, and are not imaginary. Some rearrangement has taken place in the revision of the first edition, and certain barometric tables, geodetic tables, and astronomical examples added; but definitions of terms, descriptions of easily-visible instruments and appliances, also practical directions for commonplace manipulation, have generally been excluded from the book as unnecessary. The author greatly favours the use of telemetric instruments, adding that ordinary chain measurement is generally far from being so exact as is usually imagined.\* We do not agree with this statement, nor with his recommendation that the tallies at every ten links on the chain should read from one end to the other of a chain, instead of from both ends to the middle. The author's collection of trigonometrical formulæ and examples with solutions tends to increase the size of an already bulky volume, and the reader might well have been referred to standard mathematical text-books for this information. His list of scales and their use is very valuable. He draws a distinction between absolute and relative levels. He does not favour the use of telescopic staves, and advocates the old-fashioned use of a plummet to ensure verticality for accurate work in taking levels. He gives the preference to the collimation method of keeping a Level Book. Taken altogether, the book is more a treatise for civil engineers than for architects and land-surveyors, although no practitioner would adopt all the views set forth. Some of the tables connected with curves are improved in arrangement in the new edition, and are given in a more complete form than in the old edition.

The author very properly states that the book was not written with the object of making a surveyor out of an utterly inexperienced person by its perusal alone. No book can ever do this, or go beyond assisting in doing so.

*Practical Arithmetic and Graphic Statics.* By JOHN WILSON, Lecturer on Building Construction in the Technical School, Manchester.

UNDER the above attractive title the author seeks to provide instruction in that part of the Honours Examination in Building Construction which requires a knowledge to calculate the strength of girders.

The author wisely recommends that the examples be drawn to the scales he names, which would give diagrams three times the size of those in his book; and, following the principle adopted by Professor Clerk Maxwell, he employs the excellent system so fully explained by Mr. R. H. Bow in his well-known treatise. In the working-out of the examples he selects from previous examination papers dealing with iron-work; the stresses are worked out in pounds, and not according to the English principle of so many tons to the square inch; while in the examples introducing the element of wind-pressure, pounds pressure are correctly assumed. The exercises showing the method of allowing for rivet area in tensional members is good; but the author appears to get a little confused when treating of bending moments, the results of which are described by weights independent of length. Thus, on page 12, "foot tons" are evidently implied, though this is not stated. We also note that point F is omitted in fig. 3 upon this page. Several other examples are worked out, but the figures provided in the plates illustrating graphic statics are not conveniently placed to enable a student to refer to them while studying the letterpress, and the

\* There is no survey so accurate as a properly-tied chain-survey, when the country is sufficiently open to dispense with the use of angular instruments.  
† Copies of the book may be obtained direct from the author, at Chapel Grove, Urmonston, near Manchester.



description given is by no means sufficiently complete to dispense with the use of the more extensive text-books.

**Builders' Work and the Building Trades.** By Col. H. C. SEDDON, R.E. With illustrations. London: Livingtons. 1889. Second edition, revised.

In a former number we reviewed at some length this admirable and high-class work on building construction, which, in regard to accurate scientific knowledge, clearness of expression, and excellence of illustration, is one of the most valuable works of instruction on practical problems of building to which an architectural student can give his attention. We are glad to find that a second edition is called for. As the new edition, though noted as "revised," does not appear to contain any material additions, or to differ in its contents essentially from the former one, it is only necessary here to repeat our formerly expressed high opinion of the work, and to commend it to the attention of those who are studying the practical side of architecture.

**Notes and Tables relative to the Strength of Materials.** By FREDERICK A. CAMPBELL, Lecturer on Applied Mechanics at the Working Men's College, Melbourne.

This pamphlet consists of twenty useful pages, designed primarily for the use of students in Australia, but serviceable also to those who have to design works for that colony. Quality more than quantity characterises these notes and tables, and the author states that it is his intention to supplement them from time to time, as the knowledge of Australian building materials becomes more complete. He invites the records of further experiments upon the strength of colonial bricks, stone, and timber to be sent to him. We trust he will exercise the same discretion in the extension of his pamphlet as he has displayed in its first issue, and not be over-anxious to include every record. We agree with his remark that the two requirements of the practical man are simplicity and accuracy. Long, elaborate formulæ, giving results which are not quite accurate, display great mathematical skill, but, when published, few trouble to peruse them; while more simple formulæ, which are based upon the average results of a long series of experiments, furnish the practitioner with a rule which can be carried in the brain, and applied when required. Moreover, when such rules can be applied graphically, as shown by the author in his table of bending moments and shearing forces, they are more easily remembered. The author includes tables showing the weight, tensile, compressive and shearing strengths of building stones, bricks, cements, Australian hard-woods and soft-woods, cast and wrought-iron and steel, while his notes upon the special points to be observed in their selection and employment are exceedingly practical.

**A new Skilling Book of Alphabets, Plain and Ornamental, including sets of Numerals and many Decorative Designs.** London: Field & Tuer.

In a prefatory note the publishers say that "a good, cheap, and dependable book of Alphabets" is much wanted. The word "dependable" we presume implies that those given here are all from old sources, and that what we are offered is archeological correctness. This is of value when old types of lettering are employed; and Messrs. Field & Tuer should be in the way of getting good examples.

Among the forms of letter given, that on page 4, called "Roman," but a very modified Roman, is a fine bold-designed set of plain letters. Another very good ornamental letter, of the type in which the ornamental treatment consists only of the lines themselves of the letters, is that on page 20, also that on the following page, giving the same forms of letters with a marginal enclosing line drawn round the outline at a little distance from the main block of the letter, giving an effective breadth and architectural character to the letters. The "crazy" lettering, we should say, is more honoured in the breach than in the observance. Among the highly-decorative initials are some good collections, from old examples apparently, from the style of the figures and other accessories. To those who do not feel equal to designing their own letters the book will be of use; and if "dependable," as it claims to be, it is also "cheap."

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

**7,182, Bolts for Coach-house and Heavy Doors.** W. Goodchild.

According to this invention, a link motion placed in the centre of the door and actuated by a handle throws the two bolts locking each side of the door simultaneously.

**8,485, Fireproof Columns.** R. Mannes Mann. Columns when made of cast-iron are liable to crack and give way in case of fire. This invention relates to a construction of metallic columns which, it is claimed, protects them from the destructive influence of fire. Each column consists of two tubes, preferably of steel one within the other, each or more particularly the inner tube, being strong enough to support considerably more than the load which the two together have to bear. Between the one tube and the other there is an annular space, which in most cases need not exceed  $\frac{1}{2}$  in. in width; this space is filled with material such as asbestos, which is incombustible and a bad conductor of heat. In case of fire, although the outer tube might be greatly heated, and consequently weakened, the inner tube would remain comparatively cool, retaining sufficient strength to support the load.

**8,599, Improved T-square.** W. Palmer. The blade and stock of the T-square which is the subject of this invention are held together by a bolt and nut, or a screw-pin, with one or more spring washers introduced. A spring-washer may, if desired, do duty also as a nut. The spring-washer is made of thin steel, and is in form like an inverted saucer. The bolt-hole in the blade is extended to a slot running right out, thus allowing the blade to be removed by simply relieving the spring-washer of its load. By the introduction of the spring-washer a sufficient range is obtained between being hand screwed up and of being slack to admit of the pressure being so adjusted that the angle of the blade can be altered without touching the bolt or nut, and at the same time be held sufficiently firm by the spring of the washer or washers to work with.

**17,372, Movable Timber-sawing Machines.** G. Stephan.

The machine which is the subject of this patent consists of a semicircular main body, each end of which rests on a carriage which runs on rails. A band-saw worked by a small engine is used, and timber or material is placed on fixed trestles between the two rails.

**3,872, Pavement Blocks.** L. J. Caldwell. The pavement which is the subject of this patent is made of T-shaped blocks of iron, burned clay, or other suitable material, laid in alternately reversed positions, so that they overlap each other. Each block of the pavement has a support from an area of the underlying bed greatly in excess of its upper surface. The interstices are filled in with sand.

### NEW APPLICATIONS FOR PATENTS.

**May 27.—8,747, J. Beresford, Water-closets.**—8,779, H. S. Roberts, Emergency Exit-door for theatres, &c.—8,794, R. Roberts, Smoke-consuming Grates or Fireplaces.—8,801, N. Sorensen, Door-locks, &c.

**May 28.—8,845, N. Proctor and others, Machines for Making Bricks and Briquettes.**—8,863, Esdaile & Co. and L. Tavenor, Saw-sharpening Machines.

**May 29.—8,904, A. Hogan, Machines for Cutting Laths.**—8,914, A. Tunks and F. Baker, Flush Bolts for Doors, &c.—8,961, E. Hanff, Window Fastenings.

**May 30.—9,000, E. Mann, Raising and Lowering Window-sashes, &c.**—9,011, J. Downes, Chimney-top.—9,024, S. Capon, Gate or Door Hinge.

**June 1.—9,114, P. Stein, Double-lock Latch.**—9,119, E. Fiford, Electric Bells.—9,126, T. Bear and C. Whitefield, Mireing Machines.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

**904, J. Sutcliffe, Window-sash Fasteners.**—5,775, J. Denny, Bricks, Tiles, &c.—6,037, S. Grimshaw, Opener for Windows, Ventilators, &c.—6,165, W. Charlton, Hinges.—6,624, J. Farrar, Fire-grates.—6,898, W. Barwell, Draught, Rain, and Dust Excluder for Doors.—6,930, A. Dies, Metal Dowel or Temon for Door-frames, &c.—7,109, A. Rammage, Fireproof Partition for Building Construction.—7,241, J. Wilson, Walls, Buildings, &c.—7,263, W. Thomas, Door-stop.—7,404, J. & D. Rowell, Iron Walls and Fences.—7,592, A. Hogan, Plasterer's Lath.—7,652, C. Butcher, Kitchen Ranges.—7,853, W. Syer and W. Clark, Ventilating.—8,182, J. Burford, Fireplaces.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### Open to Opposition for Two Months.

**8,412, H. Riess, Securing Opened Doors or Hinged Windows in their position.**—8,710, W. Thompson, Ventilating.—8,757, D. Williams, Flushing Cistern.—8,829, J. Calder, Water-closet Cisterns, &c.—10,180, J. da Fonseca, Water-closets

and Urinals.—10,238, Z. and J. Pack, Brick-moulding Machines.—10,544, F. Winsor, Flushing Tanks or Cisterns.—10,842, W. Davies, Flushing Apparatus.—15,857, W. Kinneer, Metallic Ceilings, &c.—3,057, J. Evans, Fastener for Window-sashes, &c.—3,083, W. Astor, Joints of Stoneware Pipes, &c.—4,733, J. Keene, Spring Hinges.—5,210, P. Träbert, Contrivance for use in Sea-folds, &c.—6,183, L. Friedrich, Tombstones, Memorial Tablets, &c.—6,517, G. Hayes, Fireproofing Buildings.—6,554, G. King, Compounds to Restrain the Setting of Plaster.

## RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

**MAY 31.—By WARD & CLARE.**  
Willesden—19 to 23 and 39 to 43 (odd), Waldo-  
rd, f., r. £234 p.a. .... £1,945\*

**By WYATT & SON (at Bognor).**  
Bognor, near—Enclosures of f. land, about 28 acres,  
in 11 lots ..... 2,720  
F. meadow land, 7a. 1r. 12p. .... 1,100  
F. meadow land, 1a. 1r. 27p. .... 680  
Brickfield and 2a. 1r. 0p. .... 280  
F. house and outbuildings ..... 380  
A cottage and three plots of f. land ..... 525  
" Norfolk House," with grounds, f. .... 800

**JUNE 3.—By ELLIS & SON.**  
Lewisham—83 to 65, Thurston-rd., ut. 73 yrs., g.r.  
£10, r. £280 p.a. .... 915

**By BORTHAM & BEVINS.**  
Paddington—11 and 12, Bathurst-st., ut. 46 yrs.,  
no g.r., r. £220 p.a. .... 3,110  
Kensington—45 and 38, Alma-st., ut. 35 yrs.,  
g.r. £10, r. £500 p.a. .... 485

**By C. W. RAY.**  
Regent's-park—8, Stanhope-ter., leasehold, a.r. £80  
p.a. .... 400

**By T. CHAMBERS.**  
Spitalfields—7, Prince's-st. f., r. £54 p.a. .... 940  
10a, Church-st., and 8, Prince's-st. and stabling,  
f., r. £295 p.a. .... 2,805  
72 and 74, Brushfield-st. and other premises, f.,  
e.r. £115 p.a. .... 5,000

**By WHITBREAD & GREEN.**  
Camden-town—The lease of the "Eagle" public-  
house, ut. 45 yrs., g.r. £10, r. £320 p.a. .... 17,000  
Kensington—363 and 365, Kenal-rd., ut. 78 yrs.,  
g.r. £18 10s., r. £58 p.a. .... 285  
122 to 128 (even), Kenal-rd., ut. 78 yrs., g.r.  
£25 4s., e.r. £138 p.a. .... 400  
Holborn—20, Brooke-st., f., r. £45 p.a. .... 790  
Walthamstow, Higham-st.—" Alicia Cottage," f. .... 100

**By BOYCE & EVANS.**  
Bethnal-green—23 and 24, Bonwell-st., ut. 60 yrs.,  
g.r. £2, r. £3 p.a. .... 300  
Haggerston—47, Lee-st., ut. 30 yrs., g.r. £2  
£28 12s. p.a. .... 220  
39, Fellows-st., ut. 16 yrs., g.r. £2, r. £23 10s.  
p.a. .... 135  
8, Basing-pl., ut. 15 yrs., g.r. £2, r. £36 8s.  
p.a. .... 165  
72 and 74, Hoxton-st., the lease of, ut. 11 yrs., r.  
£46 p.a. .... 105

**By J. & W. JOHNSON & CO.**  
Seven Sisters-rd.—6 and 8, Pooles-pk., ut. 78 yrs.,  
g.r. £12, r. £58 p.a. .... 440  
9, Pooles-pk., ut. 78 yrs., g.r. £5, r. £30 p.a. .... 520

**By W. V. WILLIAMS.**  
Caledonian-rd.—F.g.r. of £10 with reversion in 87  
yrs. .... 220

**JUNE 4.—By H. O. NEWSON.**  
Kensington—3 and 4, Doro-pk., ut. 37 yrs., g.r.  
£18 ..... 1,830  
Tulse-hill—No. 54, and cottage, ut. 29 yrs., g.r.  
£15, r. £90 p.a. .... 830

**By GLOVER & HANBURY.**  
Hydeham—" Mount Pleasant Cottage," f., e.r. £31  
p.a. .... 230

**By RUTLEY, SON, & VINCE.**  
Kensington—30 and 32, Grafton-ter., ut. 64 yrs.,  
g.r. £16, e.r. £70 p.a. .... 480  
Wandsworth-rd.—L.g.r. of £28 8s., ut. 44 yrs. .... 420

**By C. E. JOY.**  
Regent-st.—L.g.r. £83, at g.r. of £10 2s. 6d., ut.  
34 yrs. .... 900  
Tollington-park—F.g.r. of £36, with reversion in 62  
yrs. to e.r. of £265 p.a. .... 940

**F.g.r. of £25, with reversion in 52 yrs. to e.r. of  
£154 p.a. .... 680**

**By DENNHAIR, TEBSON, & CO.**  
Cambridge, near—" Milton Hall " and 73a, f. .... 5,800

**By BROAD & WILKINSON.**  
Fulham—16 to 39 (even), Repton-rd., f., e.r. £281  
p.a. .... 2,800  
50, 52, and 54, Marville-rd., ut. 87 yrs., g.r. £20  
p.a. .... 505  
60 to 68 (even), Radcliffe-rd., ut. 90 yrs., g.r. £40,  
e.r. £100 p.a. .... 1,800  
36 and 38, Chesillon-rd., ut. 91 yrs., g.r. £19,  
£30 p.a. .... 780  
Russell-sq.—49, Wolbur-st., and stabling, ut. 20  
yrs., g.r. £22 8s., r. £126 p.a. .... 770  
Drury-la.—24, Parker-st., f., r. £55 p.a. .... 1,800

**By TURNER, RUGER, & TURNER.**  
Horne, Surrey—Whitwood House Farm and 17a.  
3r. 7p. f. .... 650  
Hanover-sq.—14, Prince's-st., f., r. £235 p.a. .... 5,050  
East Grinstead—" The Rocks," and 7a, 3r. 0p. and  
tannery, f. .... 1,580

**Two f. plots of land, 2a. 3r. 29p., r. £28 p.a. .... 300**  
Three f. cottages, r. £23 8s. p.a. .... 150  
Two f. cottages, and 2a. 3r. 15p. .... 150  
F. enclosures of land, 27a. 1r. 35p. .... 1,380  
F. cottage and orchard, 1a. 1r. 29p. .... 350  
Two plots of f. land ..... 380

\* Reported in error last week as sold for £625.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Timehouse-1 and 2, Trigg's-pl., c., r. £31. 4s. p.a.<br>Poplar-2, 4, and 6, Bygrove-st., u.t. 39 yrs., g.r.<br>£12, r. £38. 10s. p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | £240<br>255                                                        |
| By WALTON & CO.<br>Maidenhead-"Oakwell" and 2 1/2 acres, u.t. 87<br>yrs., g.r., r. £45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2,500                                                              |
| By A. RICHARDS (at Enfield).<br>Enfield-1 to 5, Hildeter., f., r. £135. 4s. p.a. ...<br>1 to 4, Tait-cottages, f., r. £44 p.a. ....<br>Jasper-rd., "Nichole Villa," u.t. 52 yrs., g.r. £22<br>Pond's End, High-rd., "Clifton Villa" and cot-<br>tages, f., r. £69 p.a. ....                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1,000<br>380<br>200<br>860                                         |
| By Messrs. COBB (at Chatham).<br>Chatham-Four cottages, yard, and plot of f. land<br>Nos. 263 to 269 (odd), High-st., seventeen cot-<br>tages, &c.<br>Nos. 271, 273, 275 to 285 (odd), High-st., f., r.<br>£97 p.a.<br>F.g.r. of £12, with reversion in 22 yrs. ....<br>F.g.r. of £12, with reversion in 29 yrs. ....<br>287 to 293 (odd), High-st., and four cottages, f.,<br>r. £80 p.a. ....<br>F. rental of £40 p.a., with reversion in 32 yrs. ...<br>299, High-st., and four cottages, f., r. £60 p.a. ...<br>301 to 307 (odd), High-st., and six cottages, and<br>102 to 106 (even), The Brook, f., r. £113. 18s. 8d.<br>p.a.<br>307, 309, 311, and 313, High-st., f., r. £28 p.a. ...<br>315 to 323 (odd), High-st., f., r. £116 p.a. .... | 1,050<br>4,300<br>2,625<br>320<br>1,675<br>1,050<br>2,600<br>2,225 |
| JUNE 5.-By MABEL & BENNETT.<br>Fulham-5 and 7, Finborough-rd., u.t. 60 yrs., g.r.<br>£24, r. £145 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1,050                                                              |
| Brickton-20, Talma-rd., u.t. 55 yrs., g.r. £7, c.r.<br>£32 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 280                                                                |
| Battersea-2, Victoria-rd., u.t. 87 yrs., g.r. £10. 10s.,<br>c.r. £45 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 240                                                                |
| Shepherd's-bush-25 and 27, Hatley-rd., u.t. 90<br>yrs., c.r. £18, r. £4 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 385                                                                |
| Putney-bridge-rd.-A plot of f. land                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 430                                                                |
| JUNE 6.-By J. & R. KEMP.<br>Sudbury, Green-st., "Blakesley Lodge," f., with<br>possession                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 625                                                                |
| By BARNES & CO.<br>Kent, Bromley-Enclosures of f. land, 42a. Or. 19p.<br>"The Chequers" public-house, f., r. £50 p.a. ...<br>"The Crooked Billet" beer-house and 22a. Or.<br>21 p.<br>Freehold woodland, 32a. 3r. 7p. ....<br>Two plots of f. land                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2,000<br>1,700<br>3,000<br>1,000<br>180                            |
| By M. LIEBL.<br>Bow-104 to 110 (even), Farnell-rd., u.t. 76 yrs., g.r.<br>£14, r. £58 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 475                                                                |
| Lower Clapton-128, Clifden-rd., f., c.r. £26 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 260                                                                |
| By REYNOLDS & EASON.<br>Brixton-44, Gresham-rd., u.t. 75 yrs., g.r. £10, r.<br>£85 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 440                                                                |
| Kingland-35, Mortimer-rd., u.t. 57 yrs., g.r. 6s.,<br>with possession                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 215                                                                |
| By NEWBORN & HARDING.<br>Crouch-end-36, Crouch-end-hill, u.t. 71 yrs., g.r.<br>£13, r. £50 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 475                                                                |
| 47, Crouch-end-hill, u.t. 71 yrs., g.r. £12. 10s.,<br>r. £45 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 480                                                                |
| Holloway-1, Anstole-rd., and 32, Girdlestone-rd.,<br>f., r. £60 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 640                                                                |
| 11, Southcote-rd., u.t. 80 yrs., g.r. £7. 7s., r. £10<br>p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 320                                                                |
| Hornsey-109, Turnpike-ls., u.t. 83 yrs., g.r. £8.<br>10s., r. £40 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 450                                                                |
| Islington-An l.g.r. of £28. 6s., u.t. 38 yrs., g.r.<br>£12 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 185                                                                |
| Holloway-39, 39, and 80, Foles-park, u.t. 76 yrs.,<br>g.r. £12, r. £90 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 760                                                                |
| 61 to 70 (even), Foles-park, u.t. 76 yrs., g.r. £16,<br>r. £133 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 180                                                                |
| 72, Foles-park, u.t. 76 yrs., g.r. £4, r. £30 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1,370                                                              |
| By BLAKE & DANWAT.<br>Erith-17 to 20, Colebrook-st., 1 to 6, Colebrook-<br>vale, and a plot of land, f.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1,200                                                              |
| By FARMER, THOMAS, ELIAS, & CO.<br>Surliton, Grove-ls., "Grove Lodge," f., c.r. £20<br>Hamstead-A plot of land, let at £20 a yr., for 91<br>yrs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 535                                                                |
| St. John's Wood-116, Boundary-rd., u.t. 61 yrs.,<br>g.r. £10, r. £85 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 370                                                                |
| JUNE 7.-By HUMPHREY, SON, & FLINT.<br>Bosney Heath-The f. house "Sparrow Herne,"<br>and 12s. 1r. 24p.<br>Regent's-park-109, Albany-st., u.t. 28 yrs., g.r.<br>£15, r. £60 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2,685<br>575                                                       |
| Harlesden-1, Harlesden-grove, u.t. 90 yrs., g.r.<br>£10. 10s., r. £30 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 370                                                                |
| By H. SCUTON.<br>Mortlake-F.g.r. £48. 10s., u.t. 59 yrs., g.r. £16. 18s.,<br>r. £10, r. £85 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1,095                                                              |
| By R. TRIST & SON.<br>Kingland-140 to 143, Southgate-rd., u.t. 33 yrs.,<br>g.r. £14, r. £12 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 370                                                                |
| Hackney-40, Victoria-park-rd., u.t. 42 yrs., g.r.<br>10s., r. £37 p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 350                                                                |
| L.g.r. of £24 p.a., u.t. 42 yrs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2,430                                                              |
| By GEO. GOULDSMITH, SON, & CO.<br>Deptford-1 to 11, Manor-cottages, f., r. £216 p.a. ...<br>Warwick-st.-37, Gloucester-st., u.t. 40 yrs.,<br>g.r. £16, with possession                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 450<br>250                                                         |
| Sydenham, Russell-st.-F. stabling, r. £34. 18s. p.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                    |

[Contractions used in this list.-F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; u. for copyhold; l. for leasehold; c.r. for estimated rental; u.t. for unexpired term; p.a. for per annum yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

**New Isolation Hospital at Hornsey.**-The new Isolation Hospital, lately erected in Tatterdown-lane by the Hornsey Local Board, for the reception of persons suffering from infectious diseases, will be opened this (Saturday) afternoon, June 15.

## MEETINGS.

**SATURDAY, JUNE 15.**  
*Architectural Association*.-Vacation Visit to Elizabethan mansion at Parham, Sussex.  
*St. Paul's Ecclesiastical Society*.-Visit to Stepney Church at 3.30 p.m., and to Bow Church at 4.30 p.m.  
*Royal Institution*.-Professor W. Knight on "Idealism and Experience in Art and Life." 3 p.m.  
*Edinburgh Architectural Association*.-Annual Excursion to Peebles Churches, Neidpath Castle, Drochil Castle, Lyne Church, and Barns Tower.  
**MONDAY, JUNE 17.**  
*Royal Institute of British Architects*.-Presentation of the Royal Gold Medal to Sir Charles Newton, K.C.B.; and Paper by Professor Baldwin Brown on "Recent Advances in the Study of Architectural History." 8 p.m.  
**WEDNESDAY, JUNE 19.**  
*Builders' Foremen and Clerks of Works' Institution*.-Ordinary meeting, 8.30 p.m.  
*Royal Meteorological Society*.-7 p.m.  
**THURSDAY, JUNE 20.**  
*Society of Antiquaries*.-8.30 p.m.

**SATURDAY, JUNE 22.**  
*Glasgow Architectural Association*.-Excursion to Dabell House, Motherwell, Hamilton Palace, Bothwell Castle, and Bothwell Church.

## Miscellanea.

**British Archaeological Association.**-The closing meeting of the session was held on Wednesday, the 5th inst. Mr. W. H. Cope, F.S.A., in the chair. Mr. H. Berney exhibited a plan of the Roman foundations recently discovered at Beddington, on the Croydon Sewage Irrigation Farm. A small chamber has been excavated, but the remains are doubtless of much larger extent, and probably have some relation to the building found about twelve years ago. The Rev. Canon Collier sent plans of a Roman potters' kiln at Botley, Hants, recently explored. It is 7 ft. 9 in. in diameter, circular, with a long sloping entrance, and a seat-like shelf. Mr. C. H. Compton described the portions of the western wall of London now laid bare by the pulling down of houses at Ludgate; and Mr. Loftus Brock, F.S.A., produced a plan showing their relation to the general arrangement of the City walls. Mr. Langdon exhibited several rubbings of Pre-Norman incised stones in Cornwall. One of these was from an altar-slab now in a garden at Pendurav, and similar to another in Camborne Church. Both are inscribed, the inscription on the first being all but illegible. The other is inscribed + LEUTIV IUSIT HRC ALTARE PRO ANIMA SUA. A key pattern, similar to what appears on the Penally Cross, forms the border. Mr. W. Myers, F.S.A., exhibited a fine collection of Egyptian objects brought by him from the East within the last few months. Mr. J. T. Irvine announced that part of the foundation walls of an apse had been found at Peterborough Cathedral, forming the east end of the north aisle, similar to that recently found at the south aisle. A paper was then read by Mr. W. de Gray Birch, F.S.A., on the newly-discovered Anglo-Saxon charter of Edward the Confessor, now in the British Museum. It confirms the previous charter of Leofric.

**A New Suburban Railway.**-We are informed that a contract has been entered into for the construction of a new line of railway from Harrow to Stanmore, which will, when opened, provide for the public convenient communication with one of the most beautiful and picturesque districts within easy reach of the metropolis. The purchase of the requisite land has been completed by the Harrow and Stanmore Railway Company's Surveyor, Mr. R. T. Wreathall, and the line will be commenced forthwith, so that it may be opened at the earliest possible date. It will form a junction with the London and North-Western Railway at Harrow Station, with a terminus at Stanmore, close to the village, and as the line will be worked by the London and North-Western Railway Company, the public are likely to get the best of service and accommodation.

**Artisans' Dwellings in Copenhagen.**-The Artisans' Dwelling Association of Copenhagen, the only society of this kind in that city, has issued its report for last year, which shows that only a few new dwellings were added to the Association's property, but 350 model-dwellings are in course of erection on a site acquired near the new harbour. The hygienic state of the dwellings was very satisfactory, the death-rate in the same being only 14.9 per cent., against 23.7 per cent. in the rest of the city. Two families occupy each dwelling. A dividend of four per cent. is declared.

**The Society for the Preservation of Ancient Egyptian Monuments.**-With a view to arrest the gradual destruction of Egyptian monuments by the combined operations of natural causes and of predatory Arabs, tourists, and curiosity-mongers, a Society bearing the foregoing title has been recently formed. Sir Henry Layard, Mr. Flinders Petrie, Lord Leighton, Mr. William Gregory, Sir Frederic Meyers, Sir Lord Page Renout, Lord Wharrcliffe, Lord Carlisle, Sir Colin Scott-Moncrieff, and General Brackenbury are leading members of its executive committee. Mr. E. J. Poynter, R.A., is hon. secretary, and Mr. Bertram Currie is hon. treasurer. According to the *Times*, both Lord Salisbury and the Egyptian Government have warmly testified their appreciation of the intentions of the society. The Egyptian Government, indeed, have taken the important step of causing a careful survey to be made of those ruined temples and palaces which suffer more severely than others from perennial infiltrations of the Nile, and from the destructive power of human agencies. A full report has been drawn up by a French engineer, Grand Bey, and the estimated cost of propping masonry in imminent danger of falling, of draining and clearing various sites, and of fencing round groups of ruins, from Philæ to Abydos, is £5,000. The society proposes to raise this sum by public subscriptions, and to place it with the least possible delay at the disposal of the Egyptian Government, who will thus be enabled to at once rescue the remains of some twenty most important monuments, such as the temples at Esneh, Luxor, and Karnak. The Egyptian Government has given a further earnest of its desire to do its utmost in the matter by undertaking to provide proper inspection and guardianship of the ruins in future. As nothing, however, can be spared from the Egyptian Exchequer, the Government has sanctioned a special impost, which will yield 1,000,000 a year, which is the estimated cost of an effective system of guarding the ruins.

**Answer.**-At the Church of St. Mary Bourne, Messrs. Russell, Gibbs, & Co. have just completed a stained-glass window, in three lights, in the centre one of which is a figure of our Lord, and in the sides St. Peter and St. John. The figures are under canopies of white and gold, and beneath them are scrolls with appropriate texts. In the tracery are shown cherubim and seraphim, the whole being surmounted by the Holy Dove descending, and shedding rays of light. Beneath the window will be placed a brass tablet, with the following inscription:—"This window and brass was placed by Emma Martha Easton, of this parish, in affectionate remembrance of her father, the Rev. Wm. Easton, many years vicar of this parish; her mother, Anna Easton, and brother, Wm. Easton, R.N., who lie in the chancel; also to the memory of her five sisters, who are buried in the churchyard adjoining."

**The Russian Petroleum Industry.**-A Russian engineer, M. W. de Tchicatchef, estimates that the diurnal flow of petroleum from the Baku springs amounts to 88,000 barrels, as against 25,500 in the United States. The chief obstacles to the development of the Baku industry are the want of cheap storage and the absence of means of transport. However, the railway to Batoum, on the Black Sea, and the building of cistern steamers, in which the oil is shipped in bulk, have done much towards developing the Russian petroleum industry. M. Tchicatchef is of opinion that at no distant date all railways in Southern Russia, the Levant, India, and Central Asia will solely use the oil as fuel.

**New Free Harbour and Warehouses in Copenhagen.**-The Danish Government has decided upon constructing a free harbour, with extensive warehouses, near Copenhagen, similar to those at Hamburg. Although many plans were sent in, only one satisfied the Minister of Public Works, and that only in part. The cost of the work is estimated at 60,000.

**Cremation in Sweden.**-The cause of cremation is making good progress in Sweden, there being now, in addition to Stockholm, societies in Gothenburg, Gefle, Helsingborg, and Orebro, numbering a total of 3,189 members. There are now two crematoriums, and more are being built. Last year, the process was declared legal by the Swedish Ecclesiastical Court.

**Horne Bay.**-A Parochial Institution, comprising lecture-hall and schools, for 300 boys, girls, and infants is about to be erected. Mr. Ernest Turner is the architect.



## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                 | By whom Required.              | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------------|--------------------------------|-----------------------------------|--------------------------|-------|
| Repairing & Pitching with Stone, Marsh Bank   | Lancaster Corporation          | A. Creer                          | June 18th                | ii.   |
| Asphalting and Tarpaving Works                | Tottenham Local Board          | J. E. Worth                       | do.                      | ii.   |
| Widening Railway Bridge and Road Works        | L. & N. W. Ry. Co.             | Official                          | June 19th                | xii.  |
| Window Blinds                                 | Corporation of London          | do.                               | do.                      | xii.  |
| Painting, Repairs, &c., Caterham              | Met. Asylums Board             | do.                               | June 20th                | ii.   |
| Extension of Laundry                          | Kenington Guardians            | H. H. Bridgman                    | June 21st                | ii.   |
| Swimming Bath, &c.                            | St. John's, Hampstead          | Mr. Spalding                      | do.                      | ii.   |
| Widening Bridge                               | Cumberland Coun. Co.           | Official                          | June 22nd                | xii.  |
| New Lavatories, Sanitary Apparatus, &c.       | St. Marylebone Guar.           | H. Saxon Snell & Son              | June 24th                | xii.  |
| Repairs to Wadwatts, Hampstead Heath          | London County Council          | Official                          | do.                      | xii.  |
| Surface Drainage Works, &c., Hanwell          | Central London District School | A. Allen, Jun.                    | do.                      | ii.   |
| Cottage Residences, Grange Estate, Catford    | Engine and Boiler House, &c.   | F. & W. Stocker                   | do.                      | xii.  |
| Well Sinking, &c.                             | Borough of West Ham            | L. Angel                          | June 25th                | ii.   |
| Road Materials                                | West Cowes Loc. Bd.            | H. Moore                          | do.                      | ii.   |
| Masonry and Plastering                        | Lewisham Bd. of Wks.           | Official                          | do.                      | xii.  |
| Re-construction of Culverts, &c.              | Greenwich Bd. of Wks.          | do.                               | June 26th                | xii.  |
| New Brick and Pipe Sewers, &c.                | Wood Green Local Bd.           | H. Robinson                       | do.                      | xii.  |
| Timber Groynes on Sea Front                   | St. Marylebone Vestry          | Official                          | June 27th                | xii.  |
| Drainage and Sanitary Works                   | Level of Romney Marsh          | H. D. Good                        | do.                      | ii.   |
| Boilers, &c.                                  | Tonbridge Union                | W. Oakley                         | do.                      | xii.  |
| Refract Granite                               | Westminster Union              | J. Waldram                        | June 28th                | xii.  |
| Repairs, Painting, Colouring, &c., Slough     | Walthamstow Loc. Bd.           | Official                          | do.                      | xii.  |
| New Outlet Sinks, Watercourses, &c.           | Plants                         | Edgington & Summerbell            | June 29th                | ii.   |
| Extension of Sewer Outfall                    | British Orphan Asylum          | Haverling & Dagenham              | do.                      | xii.  |
| New Municipal Offices                         | Com. of Sewers                 | J. Hickman Barnes                 | July 1st                 | xii.  |
| Granite Kerb                                  | Eastbourne Town Coun.          | C. Toms                           | do.                      | ii.   |
| Station Works, Dudley Hill                    | York Corporation               | Official                          | do.                      | xii.  |
| Higher Grade School                           | Croydon Corporation            | W. Powell                         | July 2nd                 | xii.  |
| Painting, &c., Works, Plymouth                | G. N. Ry. Co.                  | J. Fraser & Son                   | July 4th                 | ii.   |
| Superstructure of University Coll., Liverpool | Lancely School Board           | E. H. Lingard Barker              | July 4th                 | xii.  |
| Warning Apparatus                             | War Department                 | Official                          | Not stated.              | xii.  |
| Execution of Works                            | School Bd. for London          | A. Waterhouse, R.A.               | do.                      | xii.  |
| Cleaning and Painting Schools                 | do.                            | do.                               | do.                      | xii.  |
| Annual Repairs to Buildings and Furniture     | do.                            | do.                               | do.                      | xii.  |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.    | By whom Advertised.    | Salary.    | Applications to be in. | Page. |
|---------------------------|------------------------|------------|------------------------|-------|
| Surveyor and Engineer     | Sutton Coldfield Corp. | 200l.      | June 20th              | xvi.  |
| Surveyor                  | Solihull, U.K.S.A.     | 200l.      | June 22nd              | xvi.  |
| Surveyor of the Admiralty | Civil Service Com.     | Not stated | June 28th              | xvi.  |
| City Surveyor             | Carlisle Corporation   | 350l.      | July 4th               | xvi.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BALLYBRICKEN (Ireland).**—For new parochial house, Ballybricken, Waterford, for Rev. P. F. Ryan, P.P. Mr. Walter G. Dooley, M.A., architect, 20, Ely-place, Dublin.

**Quantities by Mr. H. McConnell, Dublin:**  
Geo. Nolan, Waterford (accepted), £2,750 0 0  
(Exclusive of internal plumbing, drainage, &c.)

**CAMBORNE (Cornwall).**—For the resetting, renovation, and other works to the Centenary Wesleyan Chapel. Mr. Oliver Caldwell, architect, Penzance:—  
Moyle & Nicholas, Redruth £1,205 0 0  
John Road, Plymouth 1,149 0 0  
E. Pooley, Carn Bre 1,107 16 0  
Moyle & Richards, Camborne 1,084 10 10  
Sheela, Richards, & Berryman, Camborne 1,087 14 5  
Mills & Son, & Rowe, Camborne\* 1,023 0 0

[Accepted.]

[Architect's estimate, £1,138 0 0]

For Mason's Work Only.

A. Delbridge, Camborne, 290 0 0

**FARNHAM ROYAL (Bucks).**—For additions to "Woodgate," Farnham Royal, for Mr. W. Baylis. Messrs. Saville & Martin, architects, 88 and 87, Strand, W.C.:—  
Earl 2,595 0 0  
Crowhurst 431 0 0  
Wheeler 400 0 0

**LEDBURY.**—For alterations and additions to "The Grange," Bushbury, near Ledbury, for Mr. S. Wilcox. Mr. G. M. Silley, architect, 17, Craven-street, Strand. Quantities by Mr. S. Allen, 240, Lancaster-road, W.:—  
Hill 2,185 0 0  
Stephens & Sons 2,100 0 0  
Bowers 2,095 0 0  
Jones 1,983 0 0  
Wibley 1,894 0 0

**LEWISHAM.**—For alterations and additions to "The Lion and Lamb," High-street, for Messrs. H. & V. Nichol, Limited. Mr. Albert L. Guy, 78, High-street, Lewisham, architect:—  
Kennard 4,800 0 0  
Jerrard 1,233 0 0  
Pritchard (accepted) 380 0 0

**LEWISHAM.**—For painting and repairs to "Anchor" Brewery, for Messrs. H. & V. Nichol, Limited. Mr. Albert L. Guy, architect, 78, High-street, Lewisham:—  
Hoare 2,187 10 0  
Jerrard 1,233 0 0  
Megrah 155 0 0  
Pritchard (accepted) 141 0 0

**LEYTONSTONE.**—For the erection of three houses in the Leytonstone-road, E., for Messrs. E. Blundell. Mr. T. W. Fletcher, architect, Bow:—  
Goodman 2,150 0 0  
Thompson 1,049 0 0  
Everard 1,089 0 0  
Jennings (accepted) 975 0 0  
Martin 899 0 0  
Nicholls 798 0 0

**LONDON.**—For works at the Central Markets, for the Honourable the Corporation of London, under the superintendence of the City Architect, Mr. A. Peabes. Quantities by Mr. W. H. Stoner and Messrs. Franklin & Andrews:—

Cubitt & Co. £15,887 0 0  
Kilby & Gayford 15,716 0 0  
Clarke & Bracey 15,375 0 0  
Ashby & Horner 15,567 0 0  
Hall, Biddall, & Co. 15,554 0 0  
W. Downes 15,507 0 0  
Peto Bros. 15,487 0 0  
Lawrence & Sons 15,431 0 0  
J. T. Chappell 15,438 0 0  
Holland & Hannen 15,336 0 0  
J. Morter 15,220 0 0  
M. Gentry 15,193 0 0  
Rowlem & Co. 14,992 0 0  
B. E. Nightingale 14,948 0 0  
Perry & Co. 11,976 0 0

**LONDON.**—For works in alteration to lobby, &c., at the Guildhall, for the Honourable the Corporation of London, under the superintendence of the City Architect, Mr. A. Peabes. Quantities by Mr. W. E. Stoner:—

Hall, Biddall, & Co. £2,622 0 0  
Lasselles & Co. 2,380 0 0  
Perry & Co. 2,368 0 0  
Clarke & Bracey 2,368 0 0  
J. Morter 2,356 0 0  
Colls & Sons 2,345 0 0  
B. E. Nightingale 2,180 0 0  
Mowlem & Co. 2,080 0 0  
J. T. Chappell 2,035 0 0

**LONDON.**—For alterations at the "Washington" Music-hall, Battersea, for Messrs. G. W. Moore & Son. Mr. H. J. Newton, architect:—  
Jackson & Todd £1,687 0 0  
Burman 1,645 0 0  
Lamble 1,593 0 0  
Basle 1,540 0 0

**LONDON.**—For heating the New Central Free Library, Lavender-hill, S.W., by low-pressure hot-water apparatus. Mr. E. W. Mountford, architect:—  
J. Jones & Sons, 22, Farringdon-st., E.C. (accepted) £134 0 0

**LONDON.**—For new grill-room and sundry works at "The Corn Exchange," Tavern, Mark-lane, E.C., for Mr. Charles Deakin. Messrs. Saville & Martin, architects:—  
86 and 87, Strand, W.C. Quantities supplied:—

**Builder's Work.**  
S. Goodall £1,440 0 0  
W. Oldrey & Co. 1,395 0 0  
Ward & Lambie 1,390 0 0  
Gould & Brand (accepted) 1,337 0 0

**Plumbers' Work.**  
F. Ruse £172 11 8  
Watts & Co. 168 13 8  
W. Halling & Co. 154 15 0

**Gasfitter.**  
E. Fragnell (accepted) £85 11 6

## PRICES CURRENT OF MATERIALS.

| TIMBER.                          | £. | s. | d. | £. | s. | d. |
|----------------------------------|----|----|----|----|----|----|
| Greenheart, B.G. ....ton         | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.L. ....foot cube         | 11 | 0  | 0  | 15 | 0  | 0  |
| Sesquios, U.S. ....do            | 0  | 2  | 8  | 0  | 3  | 0  |
| Ash, Canada, ....load            | 3  | 10 | 0  | 6  | 0  | 0  |
| Birch " " " " " " " "            | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm " " " " " " " "              | 4  | 0  | 0  | 5  | 0  | 0  |
| Fr. Dantico, &c. ....do          | 2  | 0  | 0  | 3  | 10 | 0  |
| Oak " " " " " " " "              | 2  | 10 | 0  | 4  | 10 | 0  |
| " " " " " " " "                  | 2  | 10 | 0  | 4  | 10 | 0  |
| Pine, Canada red " " " "         | 3  | 5  | 0  | 4  | 0  | 0  |
| " " " " " " " "                  | 3  | 10 | 0  | 5  | 10 | 0  |
| Latb, Dantico " " " "            | 9  | 10 | 0  | 11 | 0  | 0  |
| St. Petersburg " " " "           | 5  | 0  | 0  | 6  | 10 | 0  |
| Wainscot, Riga, &c. ....log      | 2  | 15 | 0  | 4  | 5  | 0  |
| Deal, Finland, 2nd and 3rd " " " | 9  | 10 | 0  | 11 | 0  | 0  |
| " " " " " " " "                  | 8  | 0  | 0  | 9  | 0  | 0  |
| Riga " " " " " " " "             | 7  | 10 | 0  | 9  | 0  | 0  |
| St. Petersburg, 1st yellow " " " | 11 | 0  | 0  | 15 | 0  | 0  |
| " " " " " " " "                  | 10 | 0  | 0  | 11 | 0  | 0  |
| " " " " " " " "                  | 7  | 10 | 0  | 10 | 0  | 0  |
| Swedish " " " " " " " "          | 9  | 0  | 0  | 16 | 0  | 0  |
| Canada, Pine, 1st " " " "        | 18 | 0  | 0  | 26 | 10 | 0  |
| " " " " " " " "                  | 11 | 0  | 0  | 17 | 10 | 0  |
| " " " " " " " "                  | 8  | 0  | 0  | 10 | 10 | 0  |
| " " " " " " " "                  | 9  | 10 | 0  | 11 | 0  | 0  |
| " " " " " " " "                  | 7  | 10 | 0  | 9  | 0  | 0  |
| New Brunswick, &c. ....do        | 6  | 15 | 0  | 8  | 15 | 0  |
| Batons, all kinds " " " "        | 6  | 10 | 0  | 20 | 0  | 0  |
| Planking, 1st " " " "            | 0  | 11 | 0  | 0  | 14 | 6  |
| " " " " " " " "                  | 0  | 8  | 0  | 0  | 10 | 8  |
| " " " " " " " "                  | 0  | 5  | 0  | 0  | 7  | 0  |
| Cedar, Cuba " " " "              | 0  | 0  | 4  | 0  | 0  | 4  |
| Honduras, &c. " " " "            | 0  | 0  | 4  | 0  | 0  | 4  |
| Mahogany, Cuba " " " "           | 0  | 0  | 4  | 0  | 0  | 4  |
| St. Domingo, cargo average " " " | 0  | 0  | 4  | 0  | 0  | 4  |
| Mexican " " " "                  | 0  | 0  | 4  | 0  | 0  | 4  |
| Tobacco " " " "                  | 0  | 0  | 4  | 0  | 0  | 4  |
| Honduras " " " "                 | 0  | 0  | 4  | 0  | 0  | 4  |
| Bor, Turkey " " " "              | 15 | 0  | 0  | 20 | 0  | 0  |
| Bahia " " " "                    | 14 | 0  | 0  | 18 | 0  | 0  |
| Satin, St. Domingo " " " "       | 0  | 0  | 8  | 0  | 1  | 0  |
| Porto Rico " " " "               | 0  | 0  | 9  | 0  | 1  | 3  |
| Walnut, Italian " " " "          | 0  | 0  | 4  | 0  | 0  | 4  |

| METALS.                         | £. | s. | d. | £. | s. | d. |
|---------------------------------|----|----|----|----|----|----|
| Iron—Bar, Welsh, in London, ton | 5  | 5  | 0  | 5  | 10 | 0  |
| " " " " " " " " " " " "         | 4  | 15 | 0  | 5  | 0  | 0  |
| " " " " " " " " " " " "         | 5  | 10 | 0  | 6  | 10 | 0  |
| Copper—                         |    |    |    |    |    |    |
| British, cake and ingot, ton    | 45 | 0  | 0  | 48 | 0  | 0  |
| Best selected " " " "           | 47 | 0  | 0  | 47 | 10 | 0  |
| Sheet, strong " " " "           | 45 | 0  | 0  | 45 | 0  | 0  |
| Chili, bars " " " "             | 45 | 0  | 0  | 45 | 0  | 0  |
| YELLOW METAL " " " "            | 0  | 0  | 0  | 0  | 0  | 0  |
| LEAD—Sheet, English, ton        | 13 | 10 | 0  | 14 | 0  | 0  |
| " " " " " " " "                 | 13 | 10 | 0  | 14 | 0  | 0  |
| Silesian, special " " " "       | 18 | 0  | 0  | 18 | 2  | 6  |
| Ordinary brands " " " "         | 17 | 17 | 0  | 18 | 0  | 0  |
| Tin—                            |    |    |    |    |    |    |
| Strait, ton                     | 82 | 0  | 0  | 0  | 0  | 0  |
| Australian " " " "              | 82 | 0  | 0  | 0  | 0  | 0  |
| English Ingots " " " "          | 85 | 0  | 0  | 0  | 0  | 0  |
| ZINC—English sheet " " " "      | 21 | 0  | 0  | 22 | 0  | 0  |

| OILS.                        | £. | s. | d. | £. | s. | d. |
|------------------------------|----|----|----|----|----|----|
| Linsed, ton                  | 20 | 10 | 0  | 21 | 0  | 0  |
| Cocunut, Ceylon " " " "      | 20 | 10 | 0  | 27 | 10 | 0  |
| Ceylon " " " "               | 24 | 10 | 0  | 24 | 15 | 0  |
| Palm, Lagos " " " "          | 24 | 0  | 0  | 25 | 0  | 0  |
| Rapeseed, English pale " " " | 27 | 0  | 0  | 0  | 0  | 0  |
| " " " " " " " "              | 25 | 10 | 0  | 0  | 0  | 0  |
| Cottonseed, refined " " " "  | 28 | 0  | 0  | 27 | 10 | 0  |
| Tallow and Oleine " " " "    | 19 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S. " " " "    | 5  | 0  | 0  | 6  | 0  | 0  |
| " " " " " " " "              | 7  | 0  | 0  | 12 | 0  | 0  |
| Tar—Stockholm " " " "        | 1  | 3  | 0  | 1  | 3  | 6  |
| Archangel " " " "            | 0  | 15 | 9  | 0  | 16 | 0  |



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|------------------------|---------|
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# The Builder.

Vol. LVI. No. 2420.

SATURDAY, JUNE 22, 1890.

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### "L'Histoire de l'Habitation" at the Paris Exhibition.



GOOD deal of interest has been excited about the series of model buildings representing the "Histoire de l'Habitation," arranged along the line of the Quai d'Orsay

at the north end of the Champ de Mars, of which we gave some sketches last week, and of which further sketches will be found in our present number. There has not been seen before, collected in one place, such an extended series of built-up illustrations of the architecture of various periods and countries, constructed with so much trouble and in so solid a manner. At the same time, it must be said that the title of "History of the Habitation" given to this collection of models is rather misleading, and assumes a little too much. For the essential point in regard to a history of the house is the history of its interior development and plan, and this is not given in these model buildings, and could not have been given without an amount of space much greater than was available on the ground, and an expense which could not have been justified for a merely temporary exhibition. In illustrating primitive forms of house it is easy enough to give the whole arrangement of the habitation: but when we come to even the smaller dwelling-houses of civilised periods, the practical constructions necessary to illustrate these would be tolerably extensive and complicated, and would, in fact, have occupied a longer time to plan and put them together than was available in this case, independently of the question of space. And, without wishing to detract from the interest and even utility of this feature of the Exhibition, it must be added that there is not apparent in it any very extensive or minute archaeological learning. The eminent architect under whose superintendence it was erected is a man of genius rather than a *savant*; and in an archaeological sense it may be said that some men in Paris of less original genius than M. Garnier might have been better fitted by special knowledge to preside over and direct an exhibit of this kind. On the other hand it may be said that M. Garnier was the man to get it done within the allotted time, and that a more learned

archæologist of less energy and resource might have planned a superior series of Habitation exhibits, but would very possibly never have got them carried out.

What we actually have, then, is a series of built illustrations of the actual forms of a good many primitive habitations of savage peoples, and a *résumé* of the main architectural features and character of a number of types of habitation of civilised peoples, without going in detail into the arrangement of the interiors. In some cases, indeed, the houses are closed from entry, in others they have been partially utilised as shops for the sale of various kinds of bric-à-brac; a certain proportion however, are open throughout.

At the eastern extremity of the site are found the representations of the most primitive forms of habitation; commencing with the mere natural cavern in the rock; then bushes and boughs piled in a lean-to form against the side of a rock, leaving a sheltered space underneath; then we have the house built up entirely of boughs sloped against one another to form a ridge. A bush house of this kind, covered outwardly with skins, and with a removable covering to the entrance formed by a skin, takes one a considerable step further; an approach to the time when, as Mr. Browning says in his admirable poetic *résumé* of the history of architecture in "Sordello," the inhabitant—

"— Dreams, and shapes

His dream into a doorpost—just escapes  
The mystery of hinges;"

though this particular phase is not shown among the models, unless we take the lake-dwellings as an example. These are very well illustrated, an artificial pond (rather small, certainly) having been made, to give realism of effect. Into the ground are driven thick posts formed of unhewn trees, and a floor formed of cross poles; the walls of the huts being woven with rushes on a framing of boughs and twigs. If this is not *vero*, it is at all events *ben trovato*.

The buildings proper commence with an Egyptian house of the time of Sesostri, a cube with widely-projecting eaves with the angles carried by timber posts standing free from the building and imitating the general outline of the cap and turned-in base of an Egyptian granite column, but much elongated. The house is coloured white in the lower portion of the walls and buff over this, with the doors with deep red architraves and cavetto heads just breaking above the line of white wall. The upper portion shows an open loggia with

small red colonettes, and the whole is crowned with an Egyptian coved cornice painted in parallel leaf patterns or stripes of blue, red, green, and yellow. The whole appears a conjecture of the form which a habitation of perishable materials may have taken as suggested by the study of the monumental architecture of Egypt. If not unanswerable, the whole is at all events an ingenious and picturesque deduction. Next follows an Assyrian house of about 700 B.C., with the vertical reeded wall ornament which modern archæologists are familiar with; white walls and a square projecting plinth; the sky-line of the house is in square masses, one with the castelled termination so frequently seen on Assyrian bas-reliefs, the other with a finish of nearly the outline of the Egyptian cornice, but with the leaf ornament modelled in flat relief instead of being defined in colour. The upper portion of the tower has also its loggia, with colonettes whose capitals give a hint of the Ionic capital, while a rude version of the Egyptian winged globe ornament appears on the wall beneath. A characteristic frieze of light-coloured tiles finishes the portion of the wall between the two towers. Altogether the historic and geographical relations of Assyria are very well suggested in this monument. The Phœnician house of 1000 B.C. follows, with a stone basement with square windows and with the Egyptian cornice as a surbase, and a wooden erection above containing many details resembling more or less the Assyrian details, but on which a good deal of imagination must have been brought to bear.

The Jewish house, of the same date as the last, has a rather Egyptian appearance in general mass (or perhaps we should say, rather, very Phœnician), with raking door and window jambs and the Egyptian section of cornice both over the door and on a large scale as the main cornice; but the decoration of the cavetto of the main cornice is quite different, consisting of a large alternating ornament broken by hemispheres in relief at intervals: by the door is a column, or rather pilaster, with a proto-Ionic capital, which at all events serves to remind one that Palestine was geographically contiguous to Asia Minor, though the detail is not very Hebrew in its associations. The flat house and balustrade round, the "house-top" of the Bible, is not forgotten, nor the stairs leading up to it. The Etruscan house of the same date (1000 B.C.) retains one feature of the Egyptian type, the door with sloping jambs,



but we are here getting more away from Oriental influences and approaching to early suggestions of Classic architecture. The angles of the stone basement are reinforced by angle pilasters, which also retain the Egyptian predilection for the sloping line, but they are rudely fluted in three channels (does M. Garnier intend this as a suggestion of the triglyph?). The capitals show a scroll not so much Ionic as giving the idea of the scroll of the Corinthian capital before the foliage grew; the capital terminates with a thick square abacus and a small ovolo moulding of rather clumsy form under it; and the section of the widely projecting cornice to the masonry portion is evidently intended as an indication of the early beginnings of the Classic cornice, but does not serve to explain the division of the latter into bed-mould, corona, and cymatium: it is a masonry landing built out, of great projection and great thickness, but arbitrarily shaped into two beds, the jointing at the edge showing the whole as in one piece. If it had been shown in two thicknesses, the lower acting as a corbel or bracket to the other, it would have indicated an original meaning to the construction of the Classic cornice; as it is, it certainly looks very like an antiquarian form invented backward, so to speak, from the finished form of the cornice. Above this is a timber-constructed hanging verandah hanging outwards, with a tiled roof, the wall being continued up on a line, or nearly so, with the basement wall. In the capitals of the basement angle pilasters, the outer volute is worked at an angle of 45 deg. as in the Greek angle Ionic column. We should very much doubt the existence of this feature at the date 1000 B.C.

In the rear of this Phœnician house is a rude stone Pelægic habitation of circa 1500 B.C., in large unhewn masonry with roughly hewn jambs and lintel (sloping jambs to the door), and an angular "relieving arch" of two stones sloped to meet each over the lintel. Next we jump to the Hindu house of 300 B.C., a double-towered habitation with a flight of steps leading up to a door between the towers, the steps guarded at the edge by horizontal consoles flat side down; similar consoles with the flat side up support cornices above, carrying balconies with stone railings of the Sanchi tope type, which may or may not have been used in Hindu dwellings of this date; the assumption seems rather gratuitous. Above are balconies and loggie carried by bracket capitals and the inverted bell-shaped capital characteristic of a certain period of Hindu architecture, but hardly used in the same buildings, surely, as that in which the Sanchi tope railing was in use, this latter being, in fact, a Buddhist detail, and not Hindu at all.

After this comes one of the most interesting of the houses, called a Persian one of the fourth century B.C. This consists of a domed vestibule on elliptical arches, one of which forms the entry; the arches spring from coupled columns with a spiral ornament; the arches have no impost but such as can be said to be formed by the fact that the starting courses of the arches over-sail the walls or columns below, the arch being slightly corbelled out at its springing. The other portion of the building is an oblong compartment divided externally into three bays by semicircular half-columns, all in brick and with square brick over-sailing capitals; wall arches between with small windows in the upper part of each bay; internally this compartment is roofed by solid brick arches after the manner of principals across the apartment, corresponding with the half-columns outside, and the spaces between these are arched again from one to the other, making a solid arched ceiling. The external cornice is formed of over-sailing brick courses with a band of ornamental tiles over, and the whole finishing with that stepped battlement ornament which seems, like some other architectural features, to have been at one time common to various styles and countries, and hardly more the property of one than the other. The interior is in process of being fitted with Persian carpets and bric-à-brac, by Persian workmen, and will be a

charming apartment when completed; and the whole is a very interesting specimen of pure brick architecture, and one which appears to be in accordance with the probabilities and the ascertainable facts of the architecture represented.

A group of barbarous habitations follows this last-named, for no particular reason of sequence that we can see; including a hut of timber built up on high angle posts above the ground, the intention and nationality of which are not stated; and an exceedingly interesting specimen of the early "Germain-Gaulois" dwelling, which is a circular hut of considerable size, partly sunk beneath the surface of the ground, surrounded by a breast-high wall, and with a conical thatched roof carried on large upright unhewn stones planted in the enclosure wall at regular intervals, but rising about 18 in. above the top of it, so as to leave a series of "metope" openings, a kind of clear-story, all round. The entry is by a wooden door at the bottom of external steps cut down into the ground. Following these we come to the Greek House of the time of Pericles, which is disappointing, and does not at all answer to one's idea of that dwelling. Externally it is a white stone tiled house in two blocks with a courtyard between, with a slightly projecting course as a frieze, carried by the capitals of plain pilasters which are immediately discontinued below the capital, forming only corbels; the windows, divided by square columns with moulded capitals, are filled with cross lattice work looking rather more Roman than Greek; the altar in the courtyard is Roman in its ornament; and no attempt has been made at internal decoration of the rooms with colour or in any other way. Considering what a fascinating thing might have been made of the Greek every-day house of the time of Pericles, one certainly cannot accept this mere shell as doing justice to the subject. The roof rafters projecting over the eaves are treated so as to indicate the rudimentary form of the mutules, though we should fancy that in a house of this date the ends of the rafters would have had some kind of quasi-architectural treatment even in a small house, especially as the red acroterion tiles at the end of the gables are elaborately decorative. A pretty bas-relief representing a scene in family life is fixed on the end wall.

Next follows a Roman house of the time of Augustus. This has been much better done: the interior has been elaborately decorated in the style derived from the Pompeian paintings, though the arrangement of articles of quasi-Roman bric-à-brac for sale does not add to the verisimilitude of the interior. The impluvium, it may be observed, is not correctly proportioned to the roof above, it is too small or the roof opening too large; the water, when there was any rain, would have been all over the floor, and not in the cistern. The whole ordonnance of the Roman house is not shown, only the curtains which screen the private apartments. On the exterior are painted a number of more or less amusing Latin announcements and advertisements, after the manner found so constantly in the Pompeian houses. A little garden is laid out, with its mask-head fountain at the top, and a pillar with a Janus head on each side of it.

The last house before we come to the centre space opposite the Pont d'Iena is a Gallo-Roman house of the time of Clovis, which is very well done; we have here the strange mixture of Romanesque work with Classic; round arches to windows and doors, but between some of the upper floor windows are short fluted pilasters with Ionic capitals and a piece of cornice, worked in for ornament; at the angle is the capital, entablature, and base and lower drum of the column of a Classic Corinthian order, built in as a kind of buttress, and in the end wall another Corinthian capital built aimlessly into the wall as an ornament. These Classic built-in relics have been coloured or treated so as to look older than the rest, and the whole idea of this period of architectural confusion and re-shaping is very cleverly conveyed.

At the further side of the open space

opposite the Pont d'Iena the Histoire de l'Habitation continues with an admirable reproduction of the Romanesque style of French house of the tenth century or thereabouts: the inscription is given in ancient French,—  
"OSTEL ENLO SECLE DISME QUANT  
LIEREIS ERET DEL LIGNAGE GARLEMAGNE." This and the next house look exactly as if they had come out of Viollet-le-Duc's *Dictionnaire* (as possibly they did). In front there is a large segmental arch forming a porch, and springing from the upper of three corbelled-out stones with great roll mouldings worked on their ends. Above is an open gallery under the roof, with a wooden balustrade in front. The windows are mostly in pairs with a shaft with Byzantine-like capital between, straight heads and decorative wall-arches over. The next house is marked, as far as one can read the studiously antiquated writing, "MESON ENTOR LAN DE GRACE MILCCL OV TENS LE SAINT ROI LOOYS." This is one of those highly characteristic early Gothic fronts, with a pointed arch in very solid masonry below enclosing the door and shuttered window of a *boutique*, with wrought-iron grilles covering the small upper lights. Above is a boldly projecting upper story in half-timber construction, carried out in a very solid manner with heavy carved timber corbels and beams with a roll moulding. This front, which seems to have been done *con amore*, is carried out with a solidity highly creditable for a temporary model. There is none of your coloured canvas work here, showing the stone walls flapping about in the wind, but good solid genuine masonry.

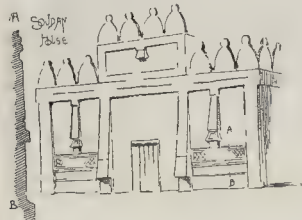
Next to these is a small early French Renaissance building, "HOSTEL DU XI<sup>e</sup> SIECLE," a charming little building, with all the main characteristics of the style duly shown—mullioned windows, panelled pilasters, &c. This has been made a *dépot* of Venetian glass, on the ground stated in an inscription over the gateway leading to the courtyard behind: "APPELES EN FRANCE PAR LE NOBLE ROY HENRI II. LES MAISTRES VERRIERS VENITIENS SE SONT ETABLIS ICI APIN DY EXERCER LEUR ART ET DEN FAIRE CONNAISTRE LES PROCÉDÉS." Behind the house is a glass-forge where Venetian workmen are engaged in their craft, and the process of turning out their ornamental blown and twisted glass can be seen in operation.

The chronological order seems to be entirely broken here, as the next exhibit is a Byzantine house of the time of Justinian. This is also a very interesting erection, carried out in a very solid manner. It shows two open galleries in front, the ground-floor with a range of square pilasters with plain moulded capitals of nearly Classic type; the gallery or loggia above has three cylindrical columns, the side ones with Ionic capitals with a circle and an emblem in the centre, the middle one showing one of the Byzantine modifications of Corinthian foliage: all the columns are short in proportion and have tremendous necking mouldings. A solid balustrade runs between the columns, panelled in various shapes, the panels being decorated in an irregular manner with emblems and ornaments and inscriptions. Over the whole opening of the loggia extends a Broddingnagian label moulding twisting round into a great circle at the two extremities. Altogether this is what may be called a very amusing erection, with a great deal of architectural history suggested in a small space.

This is followed by a Russian country-house, with a heavy rough stone plinth, on which are rough-cast white walls with heavy angle-pieces of timber, shaped into a kind of baluster outline. The upper story is entirely of wood, with ogee arches executed in plank-ing, and a horse-shoe pointed gable filled up with similar plank-ing; the loggia is gay with many-coloured curtains. A "Maison Arabe vers le XI<sup>e</sup> Siècle" follows, a white erection with a horse-shoe arch door, the spandrels gay with coloured tiles, and the over-hanging eaves brightly coloured. Whether it is on account of the recurrence of the horse-shoe



arch in both, that this is placed next the Russian house, we cannot say; but if so, this is certainly putting accidentals before essentials. Behind this is an interesting barbaric-looking white front—"Maison Mahométane au Soudan"; date not given; perhaps not known. It is a most peculiar affair, with rude pilasters hung on to the walls, so to speak, battering outward but cut off short before they reach the ground or the plinth, almost as absurdly as in a modern Queen Anne house; the roof finish is made by a series of great finial affairs two or three feet high, as shown on the sketch,



standing in a row on the cornice, a kind of ornament which hardly seems worth the trouble and labour of producing on this scale. The Chinese and Japanese pavilions which follow present the well-known characteristics of these gimcrack erections, which have in fact no more place in relation to architectural history, properly so called, than a child's house of cards.

Beyond these we come again to structures of a barbarous class, chiefly from Africa; but it is unfortunate that few of these models are provided with any label to show the designers' intention, which can only be conjectured. As in the case of the lake dwellings, one is reminded here how much the form of early and uncivilised dwellings has been influenced by the desire to get out of the way of danger of intrusion. The remarkable form shown in the sketch subjoined seems apparently intended for provision either against floods or vermin,—it is too low to be intended for a fortification against human enemies. The basement is a stone or concrete mass in the model; how it is made by those who are said to live in a hut of that build we are not told. We presume it is what would be called a mud hut; the roof is a thatch. Near this is an



example with a double circle of rough posts supporting a platform of boughs, with a plaster domical erection standing on the platform over the inner circle of posts. It is curious to see here how very nearly we have, in its essential lines, the idea of a Roman circular temple with a colonnade round and a dome above. Another fane is that with a double "colonnade" but with the inner colonnade closed up with plaster walls in the ground story, and a conical thatched roof over all. The sections of these two are appended. Apparently the idea has been to



keep together at this end of the ground the forms of barbarous dwellings which are circular in plan. We have here the circular hut of boughs brought together at the top to a point, as at the other end of the exhibits we have the same form of construction brought together into a ridge.

The collection concludes with houses of the "Aztecs" and the Incas, of the latter of which a sketch is given in the lithograph. The Aztec house, as represented at Paris, is

obviously a stone form of an original wooden construction, showing brackets in the shape and proportions of timber projecting far out from the walls, as in the Lycian tombs, and with the ends cut with rudely incised ornaments. The model reminds one also of the influence of similar conditions in producing similar effects, inasmuch as the large reeded wall ornament of the Assyrians, so obviously the record of a previous timber construction in which unsquared trunks of trees were employed, is found here again. The Incas' house is much more masonic in character, and partaking to a remarkable extent of the characteristics of Egyptian architecture, in its massiveness, its heavy cornice, and its doors with sloping jambs, and with an architrave finish which looks like the section of the characteristic Egyptian cavetto moulding turned flat against the wall, and used as an ornament in low relief.

There appears to have been some intended significance in placing the Aztec house in the vicinity of the Chinese and Japanese buildings, as the curved-out scythe-like finials of the horizontal beams in the Aztec house look very much like the execution in stone of the same type of work as that which the Chinese and Japanese for so many centuries went on executing in wood. The localities are far enough apart; the influences seem to have been similar. The Chinese and Japanese never got beyond the wooden construction which the Lycians and the Aztecs petrified into stone, in its original shapes, and which the Greeks evolved into a style bearing little or no direct preservation of its partially wooden original.

The collection of models on the Quai d'Orsay, though arranged without much regard to method or sequence, suggests a good many such comparisons, and would be of more general interest and utility to the public if some kind of guide or catalogue *raisonnée* to it were put into the hands of visitors, pointing out the historical and geographical relations of the various styles of building exemplified. As it is, it may be said that the collection is a little too much for the general visitor, and not sufficient for the architectural student.

#### NOTES.

AS it appears that the Government have undertaken to provide space for future extension of the National Gallery in the barrack-yard (according to a statement made by the First Commissioner of Works on Monday last), we do not see that there is any valid objection to the selection of the site at the back of the National Gallery for the new building for the National Portrait Gallery; a selection which we may now probably regard as definitely determined. The site is a central one, and certainly far more suitable than the scheme which was proposed and supported in various quarters of having a building at Kensington. We hope the Government promise as to providing space for the extension of the National Gallery (certain to be required sooner or later) is a *bona-fide* one, and as the law of the Medes and Persians which altereth not; and if that is so, the choice has a good deal to recommend it. The new building is to be entrusted to Mr. Ewan Christian, in consultation with Mr. Geo. Scharif, so that there is every reason to believe that the result will be satisfactory in an architectural and practical sense.

IT is probable that the introduction of Mr. Balfour's Bill for the creation of light railways in Ireland will direct attention, or at any rate the attention of investors, to the existing Irish railways. At the present time Irish railway stocks are generally at a much lower level of value, having regard to their rate of dividend, than are English railways. Considering the circumstances of Ireland, it is natural there should be some difference between the value of English and Irish railway stocks, but there can, we think, be no question that the difference is too great, even

preference stocks, which should not be affected in the same way as ordinary stocks, appearing to disadvantage by the side of English preference stocks. It would be impossible to go into details, but we may take, as one instance, the Cork and Bandon line, which pays a higher dividend on its ordinary shares than the Metropolitan, but which stands only at 76, whereas the Metropolitan is at 90. Considering the way in which the British public entrusts its moneys to companies in the most distant parts of the world, it is much to be regretted that it does not obtain sound investments in Irish railways, which would return a fair rate of interest, for the investment of British capital in existing Irish companies would stimulate further commercial enterprises in that country. It is also to be noted in regard to Irish railways that throughout the present year there has been a steady increase in their traffic receipts.

THE Comptroller-General of Patents has published his report for the year 1888, being the sixth annual report under the present régime, whereby the Patent Office forms a department of the Board of Trade. We find that during the five years which ended with December 31 last the applications for patents advanced,—and since 1885 by a fairly constant rate of progression,—from 17,110 to 19,103; those for trade-marks to nearly double the total of 7,104 in the year 1884; whilst the designs have risen to nearly 150 per cent. of the 19,753 for that same year. Of the applications for patents for the twelve months under review, 79 per cent. were deposited by residents within the United Kingdom, and about 8 per cent. by residents in North and South America. The greater portion of the remainder were received from Germany and France. The course of procedure has been often modified by statute of late years. The Amendment Act, which came into force on January 1 last, provides for, *inter alia*, the refusal of informal, as well as for the post-dating of amended applications; the acceptance of identical—or, at any rate, similar—titles without notice being given to the different parties likely to be affected thereby; and for the opposition to any grant upon the grounds either that the complete and provisional specifications describe or claim inventions which are not identical, or that the opponent has lodged, in the interval, an application for an invention which agrees with that which is covered by the other side's complete and, in the conflict contemplated, different specification.

WITHIN a few days will be opened a register of duly authorised "patent agents,"—a body that would appear to conduct for the public nearly three-fourths of the applications whereunder patents, designs, &c., are sought. The Board have framed a code of rules, under section 2 of the Patents, Designs, and Trade-Marks Act of last year, for the establishment of a register of "agents for obtaining patents in the United Kingdom." It is enacted that after July 1 next no one will be entitled to assume the style or description of patent-agent who is not registered under that Act,—existing rights are guarded by a proviso that every person who satisfies the Board, by a statutory declaration or otherwise, that he had been *bona-fide* practising as a patent-agent prior to the passing of the Act on December 24 last, may claim to be so registered. For wittingly contravening this regulation, an offender becomes liable, on summary conviction, to a fine not exceeding 20l. The keeping of this register is committed to the Institute of Patent-Agents, who are empowered to frame a scheme for the examination in professional knowledge and skill of such candidates as do not come within the retrospective clause of the statute. For that examination certain previous qualifications are required. It will be open to all who have matriculated at any university in Great Britain and Ireland, or have taken certificates in the Oxford and Cambridge Middle Class Senior Local Examinations, or have passed any examination for admission



into our Civil Service. This final examination by the Council of the Institute, will further be open to any solicitor in England or Ireland, any law agent practising before the Scots Court of Session, and to any one who has served for not less than seven consecutive years as pupil or assistant to one or more registered patent-agents. The registration-fee is fixed at five guineas, and an annual fee of three guineas is payable in addition. An entrance-fee of two guineas will be charged to each candidate for the final examination. The Council are required to print copies of the Register at stated times, to make periodical reports of its contents, and to arrange for an appeal to the Board by any patent-agent who may feel aggrieved by their action in connexion therewith.

MR. JEFFERDS, C.E., is still pressing upon the attention of the British public his suggestions as to rolling-stock reform on our railways. He complains that our officials "cling with death-like tenacity to the ways of our forefathers," and has now addressed a circular letter to the Chairmen of Chambers of Commerce, endeavouring to arouse them to a sense of the loss resulting to the community from this conservatism. We need not repeat Mr. Jeffers's arguments as to the superiority of the large American "bogies" freight-cars, as they are now tolerably familiar,—as, indeed, are the cars themselves to many railway officials and others. Those that were on view at St. Pancras a year or so back, when we referred to the matter, were not, it appears, for use on the Midland line, but were put together there prior to being sent down to Barrow for the Furness Railway Company. There is no doubt that the employment of these cars for heavy loads would materially reduce the amount of dead-weight requiring to be hauled, but a large proportion of our traffic (urgent and perishable goods) is necessarily sent in quantities for which even our present type of truck is really too large. Mr. Jeffers estimates the proportion of such traffic to be only 28 per cent. of the total, and concludes his remarks with a very practical one. He offers to build in England, and lease to the companies, all the freight rolling-stock they require at a daily rental of 2s. each car. For our ordinary trucks,—which are only one-fourth of the carrying capacity of the American type,—the usual charge for demurrage is 3s. per day, so that the proposal appears to be worth consideration. Another scheme for reducing the expenses in this department of railway work is suggested from another quarter,—by means of amalgamation of rolling-stock. We allude to a suggestion made by Mr. C. F. Clarke, of Wolverhampton, for the establishment of a "Universal Rolling-stock Company," to which each railway company should transfer all its trucks in exchange for a proportionate share in the capital. This would probably be economical (if workable), and it is evident that the positive loss entailed by non-paying stock,—in the shape of idle trucks and superfluous dead-weight,—is being increasingly recognised, and that the question is one with which our railway managers will soon feel compelled to deal.

THE position and condition of water-supply reservoirs in this country have at no time attracted more critical attention than they are now receiving owing to the recent dreadful disaster in Pennsylvania, and works at the present time in progress are naturally examined more closely than they would have been. Glasgow's scheme for the extension of its Loch Katrine supply, as an instance in point (already mentioned in the *Builder*) includes the raising of the loch level several feet higher by additional dam works, and the formation of a second service-reservoir a short distance from the city. The surplus overflow of the loch finds its way now, as always, by the Teith into the Forth, and thence to the eastern sea. This is the track that any released body of surface water would take, till such time as the level fell to its old

natural mark, in the event of a decisive disaster to the impounding works at the overflow weirs of the loch, and it is not easy to estimate the amount or quality of damage which would thereby accrue. The service-reservoirs, situated eight miles outside of Glasgow, and into which the tunnelled conduit from the loch leads, are purely artificial in construction, with no natural barrier; and, of course, unlike the loch in this respect, in the event of their retaining barriers giving way, the shoot of escaping water would be continuous till the dams were empty. Continuous, yet independent of each other, they are comparatively large storages, the old reservoir, when full, containing 550 million gallons, and the new one, which is yet a long way off completion, 700 millions, and, therefore, with destructive force enough, from the elevated and commanding nature of their situation, to cause no little havoc if incontinently let loose. Half-a-mile farther down the small branch strath, a portion of whose hollow these reservoirs fill up, stands a bleaching and dyeing township of from 2,000 to 3,000 inhabitants, on the direct line to Glasgow, with below, leading to the neighbouring river Kelvin, a well-cultivated and somewhat level tract dotted with farm-buildings and cottages. The Kelvin drains the whole of the region here, passing generally southwards till it enters the Glasgow circuit, within which it finally discharges. This is the course which all the storm-waters of the district take; and from the volume brought down after heavy rains, it is easy to conceive that the sudden release of a very large storage of water in the uplands would be peculiarly destructive, the neighbouring township with adjoining mills and farmsteads being likely to come in for swift destruction, while a portion of Glasgow itself would be put in peril. The situation is certainly suggestive of a bad ending to any mishap of the Conemaugh reservoir order; but if the old works were strong above all ordinary risk before, they are sure to be made even stronger now, while the new works still in progress are bound to have bestowed on them a store of extra,—perhaps needless,—solicitude and care, which otherwise would certainly have been missed. This is an additional security; but the main security, and the best, consists in the tried skill of the engineers in charge, and in the certainty that there is no risk of a blunder being committed out of any leaning to a mad and criminal so-called economy, which is the ordinary source of disaster coming in the long run to works of this kind.

IN an article upon the forthcoming sale in Paris of M. Secrétan's collection, the *Times* mentions Sir Joshua Reynolds's "Mrs. Seymour [sic] and her Daughter." This is assuredly the painting which, by some strange confusion, Reynolds entered in his pocket-book, under date Jan., 1786, as "Mrs. Seaforth and Child." Again, under date June, 1787, he writes "Mrs. Seaforth." This mistake has been commonly perpetuated—even by Bromley and other authorities; and it is high time it were set right. The portrait, painted circa 1786, was engraved by Joseph Grozer, of whose mezzotint (May 10, 1787) may be seen three copies in our national collection. His print is entitled "A Lady and Child." The lady in question was Mary, daughter to Baptist Proby, Dean of Lichfield. On April 22, 1782, she married Lieutenant-General Francis Humberston Mackenzie, titular Chief of Kintail, who on October 25, 1797, was created Baron Seaforth of Kintail, County Ross. Succeeding to the family estates in 1783, after reversal of the attainder, he in turn was known in his own country as "Seaforth." His kinsman, Kenneth, seventh and last Earl of Seaforth, hereditary Chief of Kintail, and of the clan Mackenneth, from amongst whom were originally raised three of our present Highland regiments,—the 71st, 72nd, and 78th,—had died in 1781, leaving an only child, Caroline, since Countess de Melfort.\* Baron Seaforth died in Edinburgh on Jan. 11,

1815. In him was accomplished the dying warlock's prophecy that had long hung over the fortunes of his house. He was deaf, and in early life almost dumb; his three sons predeceased him. His daughter Mary, the child of the portrait, married Vice-Admiral Sir Samuel Hood, Bart. Having returned to Scotland from India as a widow, the "white-hooded lassie from the East" of the seers' prediction, she married the Right Honourable James Stewart who thereupon assumed the name of Mackenzie. Lady Seaforth died at Edinburgh on February 27, 1829, aged 75 years. Her daughter Mary entertained at Brahan Castle, the ancestral home of the Mackenneths, the regiment raised by her father, the 78th "Ross-shire Buffs," upon their return to Fort George after the Mutiny when they were hailed as the "saviours of India." In his lines upon Lord Seaforth's death, Sir Walter Scott alludes to his triumph, by sheer force of character, over the afflictions under which he lay—

"In vain the bright course of thy talents to wrong,  
Fate deadened thine ear and imprisoned thy tongue."

and addresses the concluding stanza to the daughter—

"And thou, gentle Dame, who must bear to thy grief,  
For thy clan and thy country the cares of a chief,  
Whom brief rolling moons in six changes have left,  
Of thy husband, and father, and brethren bereft;  
To thine ear of affection how sad is the hail,  
That salutes thee the heir of the line of Kintail."

WE noted some weeks ago that in his scheme of lectures at University College and the British Museum, Professor Poole intended to reserve the subject of Greek Archaeology for the summer months, in the hope that the classes might be utilised by University students of Oxford and Cambridge. The course is now advertised. Demonstrations are to take place daily at 5 p.m. in the Museum from July 1 to 13. The course is to embrace "Sculpture, Bronzes, and Terra-cottas," by Mr. Talfourd Ely; "Coins," by the Professor himself; and "Vases and Painting" by Mr. Cecil Smith. Two introductory lectures were given last week (June 10 and 12) at University College by Prof. Poole and Mr. Talfourd Ely. The subject of Professor Poole's lecture had been announced as "The Place of Archaeology in University Teaching," and probably some of the audience were disappointed that no attempt was made to fix more precisely a somewhat warmly-disputed relation. Instead, Professor Poole thought it best, and perhaps rightly, to give some general illustrations of the service archaeology has rendered and may render to Classical learning, and then to review briefly each branch of the subject to be dealt with by his collaborators. Mr. Talfourd Ely's lecture on the 12th dealt with "Athens,"—a wide subject. Naturally most of it was devoted to the recent discoveries of archaic sculptures. The lecture was illustrated by lantern. We are, for popular, and even sometimes for specialist, purposes, much in favour of lantern illustrations. They have this great merit, they can be flashed up at the moment, the effect is instant, vivid, brief, therefore the more incisive. But it would be idle to deny that lantern slides have their special snare for the lecturer. He has certain effective slides, and he is tempted to show them. Surely, whatever may be thought of archaeology in general, moonlight effects on the Acropolis are not matter for University teaching! Archaeology is too much on its probation to venture on ground so dubious, and the Professor is, we trust, too intent on serious work to allow it.

IT is proposed to inaugurate the Scottish National Portrait Gallery in the last week of June or the first week of July, the ceremony to be performed by the Marquis of Lothian, Secretary for Scotland. The gallery occupies the west half of a characteristic, but somewhat sombre-looking, Gothic edifice erected at the east end of Queen-street, Edinburgh, from designs by Dr. Rowand Anderson, architect. The eastern half of the

\* See his portrait in one of Sir Joshua's two groups, now in the National Gallery, of the Dilettanti Society.



building (which the country owes to the liberality of an unnamed donor) is not yet completed—it is to be occupied by the Society of Antiquaries. The two portions are separated by a rectangular hall, which is surrounded by a double arcade, one superimposed upon the other, access to the upper arcade being obtained by flights of stairs on either side. A collection of portraits has been accumulating since 1884, and these are temporarily located in the new University buildings. This collection will be enhanced by the addition of sixteen portraits, from the National Gallery on the Mound, of Scottish celebrities, which will comprise a portrait of Kemp, the architect of the Scott Monument by William Bonar, R.S.A., and of other celebrities, by Thomas Duncan, R.S.A.; Sir John Watson Gordon, P.R.S.A.; Colvin Smith, William Aitken, Sir David Wilkie, Sir Henry Raeburn, &c. The collection will be further enriched by a number of portraits of historical interest to be lent for the occasion.

**PIETRO STROZZI**, Prince of Forzano, eldest son of that noble and very ancient Florentine family, has had part of the historical and marvellous palace of his ancestors repaired. Prince Strozzi has begun the works on the outward part of the palace, repairing with particular care the side looking on the "Via degli Strozzi" and the "Piazza degli Strozzi," much of the detail of which is decayed and in danger of perishing, as nobody had thought of repairing the damages wrought by time since the end of the fifteenth century. This important and delicate task was confided to an architect, Signor Pietro Berti. The halls of the palace have also been newly decorated. It must be observed that the Strozzi palace, built towards the end of the fifteenth century by Filippo Strozzi, surnamed "il Vecchio," was never completed. The second floor was hardly begun; on the first floor were left immense vaulted halls, with finely sculptured stone doors, but otherwise bare and bereft of ornaments. The present Prince Strozzi, wishing that part of his palace, at least, should be in harmony with its exterior, has had an apartment furnished in the style and character which would have been followed by the successors of "Filippo il Vecchio" had they finished that eminent citizen's construction. The spacious hall at the top of the grand staircase has been embellished by a magnificent chimney-piece of the sixteenth century that had lain forgotten in a cellar of the palace. The reception-room, or ball-room, has been decorated with red velvet hangings and red and yellow trimmings. But what are principally admired are the windows with the stained-glass, richly painted with fantastic ornaments in the style in which Giovanni da Udine, who lived in the sixteenth century, so excelled. After this hall we find the library, which contains great book-cases in the usual sixteenth-century style. The dining-room comes next, and is the most successful of the restored rooms. The bottom of the partition walls is of a dark-yellow hue; upon it many little eagles with folded wings, and the motto, "Especto," representing one of the many mottoes of the Strozzi, are seen. A large chimney-piece, sculptured in "pietra serena," together with some terra-cotta work in imitation of Della Robbia's school, ornament the room.

WE have received from the Medical Officer of the Local Government Board a batch of three reports\* to the Board by inspecting medical officers as to inquiries made by them regarding the sanitary condition of places so widely removed as Macclesfield, Hatfield, and Fareham. The first report mentioned is that by Dr. Parsons on "an outbreak of scarlet-fever, with associated diphtheria and sore throat, occurring in the Macclesfield Rural and Urban Sanitary Districts in connexion with a particular supply of milk." The outbreak, it seems, occurred in the township of Upton, and the part of

Macclesfield adjoining it, at the end of January last. Upton is a small place, containing only forty-one houses and 228 inhabitants. "Most of the houses are on the side next Macclesfield, forming practically a suburb continuous with the borough; they are villas inhabited by private residents and people of the middle-class who have business in the town. They are supplied with the town water, but do not drain into the town sewers, the sewage being carried into cesspools or water-courses. There are also a few farm-houses and cottages. The situation is elevated about 500 ft. above the sea-level, and the soil is sandy. The part of Macclesfield immediately adjoining Upton is of similar character, but further in the town are streets of smaller houses inhabited by artisans. It is on the side of Macclesfield towards Upton, the west side, that the scarlet-fever has mostly occurred; more distant parts of the town having almost escaped." It was found that all or almost all the patients had procured their milk from one dairyman, whose farm-house was visited by Dr. Parsons. As to its sanitary condition Dr. Parsons reports:—

"The surrounding surface and the interior of the house were, at the time of my visit, scrupulously clean. The scullery-sink pipe discharges in the open air. In the cellar in which the milk stands (when any is kept over) there is a 'sump' in the floor to catch water when the floor is washed: this was formerly connected with the drain, but the connexion is said to have been severed, and no offensive smell or current of air from the sump was discovered by me. The cellar wall was damp in the corner nearest to the privy. The privy is built against the house wall, and is entered from the wash-house; it is insufficiently ventilated, and at my visit was very offensive. The space under the seat is connected with a drain which receives also the liquid from adjoining pig-sties, and discharges into a tank about 35 yards distant, the contents of which are pumped out once a year (last in March, 1888), and distributed over the land. The water-supply of the household has, until after the outbreak, been obtained from a pump in the yard. The well is about 7 yards from the privy and pig-sties; the water had always been considered good, but at one of my visits it was turbid, with an unpleasant taste; becoming more turbid with floating particles on prolonged pumping. On analysis it was pronounced to be contaminated with sewage and unfit for drinking purposes. This water was used for rinsing the milk-cans, but (with certain exceptions) it was not drunk by the cattle, who resorted to a spring in a field, not likely to receive sewage pollution."

Although the state of things revealed in the foregoing extract is very far from that which should obtain in an ideal dairy, there seems to be some doubt whether the condition of the premises had any direct connexion with the contamination of the milk; it is possible that the mischief was done by the addition, to the general stock of milk, of that yielded by a cow which calved a few days before the outbreak, and whose milk may possibly have become infectious by reason of the development, in the puerperal condition, of some ailment so trivial or so evanescent as to have escaped notice. But the lesson of the outbreak is the old one that dairies and agencies for the distribution of milk should be under strict sanitary and veterinary supervision.

**DR. R. BRUCE LOW'S** inspection of and report upon the sanitary condition of Hatfield was made in consequence of the Medical Officer of Health for the Hatfield Rural Sanitary District recording, in his annual report for 1887, "an exceptional prevalence and fatality of diarrhoea" during that year in a particular part of Hatfield town. In the opinion of the Medical Officer of the district, these effects were the result (1) of absence of main-sewer ventilation; (2) absence of efficient scavenging; (3) insufficient house drainage; (4) defective slaughter-houses; and (5) existence of stables in confined spaces. But, in spite of these defects, the Local Authority expressed its "firm opinion" that the sanitary condition of its district was "fairly good." The Local Government Board was not, however, content with such soothing assurances, and told the Local Authority so. The matter stood until, at the end of January last, the annual report for 1888 of the Hatfield Medical

Officer of Health was sent in, and was found to contain a passage as follows:—

"During the year one portion of the main sewer was found to be blocked in Hatfield in the lower part of the town; it was found to be in a very bad condition, and much out of level. In part of it the sewage remains standing, and there must be constant leakage into the subsoil. It may here be remarked that it was just in this low-lying part of the town in which there were so many infant deaths last year (1887) from diarrhoea."

On the 12th of February the Board wrote to the Local Authority again calling attention to the statements of the Medical Officer of Health, and inquiring what action was being taken in the matter of this sewer. In reply, the Local Authority wrote (on March 8) that

"Upon referring the question of the condition of the main sewer in the lower part of the town of Hatfield to their Inspector of Nuisances, he reports that he is quite satisfied with the condition of the sewer, and in his opinion no nuisance from it exists."

Thereupon the Local Government Board determined to ascertain for itself the facts of the case, and this is what Dr. Bruce Low has to report of it:—

"At the date of my visit, two of the manholes in the London-road having been opened, and a portion of the old brick sewer having been exposed, it was found that the mortar between the bricks forming the sides and crown of the sewer had here and there crumbled away, so that in many places there were openings between the bricks, and the sewer had therefore ceased to be watertight. In addition, there was found a considerable deposit of black sludge within the sewer, strongly suggestive of the gradient of the sewer being, if not irregular, at least a very poor gradient. With a view to test this, fifteen buckets of water, highly coloured with 'Venetian red,' were poured down a manhole just above where the sewer had been repaired, and it was found that twenty-five minutes elapsed before any red colour could be detected in the fluid contents of the sewer at a manhole about 100 yards lower down."

**MR. SPEAR'S** report upon "the prevalence of diphtheria in the Fareham Registration District, and upon the occurrence therein of enteric fever," seems to show that a certain "mixed school" had a great deal to do in disseminating the disease. Dr. Spear reports that:

"Looking at the evidence, it would seem that the disease spread in the mixed school, either by the repeated introduction there of convalescents but still infected children, or by their still infected clothing (i.e., by 'fomites'), or by some continuing focus of infection attaching to the school itself. . . .

"The two schools stand on sandy soil at one corner of Salisbury-green, a narrow plantation and the high-road separating them. The mixed school consists of one long room divided by a partition; the whole giving floor-space equal to some 1,850 square feet, or a trifle more than 10 square feet per head, supposing the total number of children on the books were present, and a cubical capacity of some 14,400 ft. The building stands on a slope, so that a considerable space is left beneath the floor. In one part this is vacant, although enclosed, and the Inspector of Nuisances, who had examined it, reported that it was practically unventilated; dry, but permeated by an exceedingly 'musty' smell. The remainder is utilised as the kitchen and scullery of the schoolmaster's house, and until the autumn of 1887, when a new house adjoining was built for him, his sitting-room was situated here also." An internal staircase provides direct communication between this basement and the school-room. In April, 1887, when the premises were examined by the Medical Officer of Health and Inspector of nuisances, it was found that much stagnant water lay beneath the kitchen and scullery floor, and that a defective and leaky drain was likewise contaminating that space. Within some 10 ft. of this drain, moreover, the well was situated, and the water (to which it is believed the children had occasional access) was found to be polluted by seepage from the drain. These drainage defects were remedied about September, 1887, and a new house, as I have said, was built for the schoolmaster. A little earlier in the year ventilators of the 'Tobin tube' variety were inserted in the school-room (before inadequately ventilated), and the schoolmaster's access likewise. The school privies, situated some yards from the building, are reported to have been, until June, 1887 (the third time of closing the school on account of diphtheria), exceedingly foul; and now their defects have only been partially remedied by curtailing the size of the cesspits, and by the provision of a small pipe-shaft as a ventilator. The infant school is built on level ground, and has no

\* The schoolmaster's family consisted at that time of two adults and two elder children. They do not appear to have suffered from any symptoms of diphtheria.

\*To be purchased, either directly or through a bookseller, from Eyre & Spottiswoode, London; A. and C. Black, Edinburgh; or Hodges, Figgis, & Co., Dublin.



basement, dwelling, or drain in connexion with it. Ill-kept earth or ash closets stand, however, in very close proximity to the school-room door."

**P**ARISIANS complain as much as visitors of the inadequacy of the public service of vehicles for getting to the Exhibition. For visitors who stay at the hotels in the central quarter of Paris we may note that there are three courses open to them for getting to the Exhibition, besides the generally exorbitant *frais*. One is by river steamer from the neighbourhood of the Pont Royal or thereabouts, providing an admission ticket to the Exhibition first (plenty are sold on the quais), as the landing-stage at the Exhibition lands the visitor right into it, and tickets are not sold on the boats. The second is by tram-cars which run along the quais on the north bank, and which cross the Pont d'Alma and go down the Avenue Rapp, landing the visitor at the side entrance of the Champ de Mars by the Palais des Beaux-Arts. The third route is to cross the Pont de la Concorde and enter by the gate opening into the Esplanade des Invalides, two hundred yards or so from the bridge. From here there is a miniature railway (five sous a ticket), within the precinct of the Exhibition, running to the Champ de Mars along a rather narrow track lined with polyglot warnings against putting the head or feet out on account of the close contiguity of the trees' trunks. It is an interesting philological study to note the various forms taken by the word "Attention!" which heads these printed cautions. The two most suggestive and picturesque forms are "¡Ojo!" and "¡Djager baik!" but what languages these represent we did not discover.

**T**HERE is a story of an English sailor who remarked that he should like to get to the North Pole, "if it were only to hang his hat on it, for the say-so of the thing." There does not seem to be much more than the "say-so" to be obtained from getting to the top of the Eiffel Tower, which this week has at last been thrown open to the public—as far as anything can be said to be "thrown open" with which French officialism is concerned. In this respect the management of the Eiffel Tower is only too typical of a system of public administration of which the general object seems to be to exercise every device of red-tape to delay, annoy and irritate the visitor. It costs five francs to go to the summit of the Eiffel Tower; but you cannot purchase a ticket for the summit direct—that would be making it far too simple and easy. You must pay two francs at one office for a ticket for the première étage; arrived there, you have to search, at the further extremity of the large platform crowded with restaurants, &c., for the office where you have the privilege of purchasing for one franc a ticket for the deuxième étage. Arrived there, you have to "make queue" for three-quarters of an hour or so to get to the ticket office where you pay two francs for the lifts for the final trip. There is a perfectly commodious and safe staircase up which any one in robust health could walk to the top in a few minutes; but this may not be used, for some unexplained reason. You may descend from the second to the first platform by a staircase, but the continuation of the same staircase, by which you would naturally and easily continue the descent, is "défense de descendre," and you have again to make an excursion amid the labyrinth of the first platform to find the staircase by which the rules permit you to descend to the ground. By dint of these ingenious arrangements it results that the best part of an afternoon is consumed in getting to the top of this precious erection and getting down again, and employment is thus found for a number of incorruptible officials of the Republic in stopping every one from employing the straight and easy way of going up and down. When arrived at the top, it will be found that the spectacle is no better or more impressive than from the second platform, in fact rather less so, and the feeling of height does not seem greater than at the second platform. The only thing to be remarked on is the loss, from this point

of view, of the spread of the Tower at the base, which, owing to the perspective diminution, nearly disappears, and one seems to be looking down from the top of a nearly vertical construction. Any one, however, who gave it a thought ought to know that this would be the case; it hardly seems worth while going to the top to prove it; and that is all the visitor will get by going, except irritation and loss of time.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—VIII.

1967. "New Buildings, University Library, Cambridge; Quad. side": Mr. J. L. Pearson, R.A. This is a block of building in late Gothic and thoroughly collegiate style, with a gateway with octagonal flanking turrets according to the *genius loci*, and windows with the heads filled with heavy and rich-looking tracery of the perpendicular order. The new building, however, abuts most awkwardly on the Classic block at the right-hand side, which the architect seems to have treated with absolute and contemptuous indifference, and without the slightest effort to group or combine the two in any rational architectural manner. We call this a somewhat barbarous manner of making additions to a building which is worth a good deal of respect in its way, in spite of being in a style which Mr. Pearson does not care for. There is no explanation as to the purpose of the new building, which, from the arrangement and size of the windows, does not appear intended for library purposes in the usual sense.

1968. "Dining-room Decoration": Mr. Henry G. Liley. A very neatly-executed coloured drawing of a scheme entirely commonplace both in colour and detail. Why is it hung in so honourable a position? The size of the drawing, we presume.

1969. "Café Monico: Shaftesbury-avenue Front": Messrs. Christopher & White. We gave a photo-lithograph of this drawing on June 1; the building looks better in reality than in the black-and-white drawing, owing to the fine rich tone of the terra-cotta employed, and the contrast with the granite base. It would have had much more force and character if the pavilions at the two ends had been kept nearly plain, as a step to the richer work of the centre; to repeat the pilasters on the upper story of these wings was a great mistake. Generally speaking the building looks like what it is, and perhaps deserves to be chronicled as the best of the new Shaftesbury-avenue fronts so far; but that, unhappily, is not saying very much.

1970. "Shiplake Court on Thames": Messrs. Ernest George & Peto. We presume this is a new house, though every effort is made in the drawing to give it the appearance of an old one. The river front shows a raised balustraded terrace between the two projecting wings of the house, an arched porch at each end against the wing; along the terrace front the tall windows with a projecting bay mark one of the principal rooms. The courtyard front is a curious and picturesque mingling of cottage with castellated architecture, with a studiously irregular chimney breast (such as used to be a *bonne bouche* in "Harding's Sketch Book") in one place; in another a single timber and plaster gable put in as if it were an afterthought. All this,—if it is really an entirely new building, which is still open to doubt,—is of course mere playing at antiquity, but it is very well done; to adopt a criticism of President Lincoln's, "For those who like that sort of thing, it is just the sort of thing they would like." If the house is as picturesque and varied in internal arrangement as it appears externally, it should be a pleasant and entertaining one to live in; but no plan is given, and this is just the kind of house architecture which imperatively requires a plan to explain either its merits or its demerits, whichever predominate.

1972. "Black Knoll, Brockenhurst, Hants": Mr. Reginald T. Blomfield. This is a kind of bird's-eye-view on brown-toned paper of what appears to be a prettily-grouped country house and surroundings, but it is a slight drawing, and not easy to see in the position in which it is hung. Being a drawing with a very high horizon, and intended to give the effect of looking down on the group of buildings, it is of course, according to the usual rule in Academy hanging, placed at the very top of the line, as high above the eye as can be.

1974. "Design for figure subjects, modelled

in terra-cotta, in one of the gables of the new Law Courts, Birmingham": Mr. W. Aumonier. A drawing of a gable in which three triangular spaces left by the architectural lines, one in the centre and one near the base of the gable on each side, are filled each with a figure: the symbolic meanings of the figures are not obvious, but they have the decorative merit of filling the spaces allotted to them exceedingly well, besides being vigorous and spirited in design. The upper one is a standing figure under a projecting canopy, looking forward and with the right hand resting on a shield, at her left is an Ionic capital and drum of a column, apparently as a supporter for something, it is not obvious what. On the pier dividing two decorative arches immediately beneath this figure, are sculptured the sword and scales of Justice, with a scroll bearing the word "Forward." It is not very apparent why Justice should be thus admonished; perhaps it is a suggestion of the architects' as to the necessity of a great scheme of law reform.

1975. "Reredos for St. Mary's Church, Portsea": Sir A. W. Blomfield, A.R.A. An exceedingly rich and delicate piece of modern Gothic decorative work. It consists of a large composition in (we presume) wood, divided into bays by shafts and quasi-buttresses according to the Medieval manner, sub-divided by mullions and transom bars into richly-traceried panels, the upper ones being of open work. The outline drawing is shown on one side, and the colour treatment on the other side. The large centre compartment is occupied by a painting of the Adoration of the Magi, with richly-coloured draperies, and a gold ground, slightly broken by arabesque lines, in the upper portion. The spandrels above the picture are occupied by cherubim on a gold ground. In the panels of the side portion are figures of apostles, relieved against a gold ground in the lower portion of the panel (the heads of the figures just issuing above and breaking the line of this), while the upper portion, behind the tracery, shows a red or green ground with gold powderings. The front of the communion-table is treated with traceried panels with angel figures on gold ground. Every portion of the detail seems to have been carefully studied, and the effect of the whole is both rich and delicate.

1977. "St. John's College Oxford; east side of inner quadrangle": Mr. F. W. Troup. A measured geometrical drawing of this interesting and charming bit of English Early Renaissance work, with cross sections of the return buildings of the quadrangle: it is rather too small in scale, however, to show properly the details of the arcade; but the author is to be thanked for providing us with a measured illustration of it.

1980. "Hall, Netley Castle": Mr. J. D. Sedding. A very well and freely executed water-colour drawing of what we presume is a new interior, as it bears the legend "J. D. Sedding, architect" on the drawing; but it looks more like a Medieval interior a little touched-up at a later period. It is a boarded gallery with stained and polished floor, and stone walls partially wainscotted in the lower portion; large four-centred stone arches, with boldly-moulded sections, cross the openings, and the stairs are seen beyond. If this is new work, it carries us back curiously to the days of Salvin and Peckford's Castle, once the great example of modern Medieval castle building. We thought this kind of thing had been given up. It is an interesting amusement however, for those who can afford it, and a splendid pastime for the architect.

1981. "A Toilet Set; The Mirror": Mr. W. G. B. Lewis. This is a very rich piece of decorative design for a circular mirror, the foot constructed to revolve horizontally on a circular stand, while the mirror itself is hung to swing in a circle or hoop enclosing it. The whole is gilt: the foot bearing the mirror-frame is designed somewhat like the usual form of the spreading foot or base of a Medieval chalice, but with a double instead of a single stem, the two stems worked into the same spreading base. The back of the mirror is very richly treated, divided out into trefoil spaces filled with designs in which coloured enamel is partially introduced. A pretty feature in the design is that the mirror is smaller than the frame, leaving a little clear space all round, which is studded with red stones of some kind set projecting on the outer disc of the mirror and showing against the light between the mirror disc and the frame. The "knop," in Medieval form, which occupies the necking of the double stems, and connects them together, is also



studded with precious stones. A defect in the design is that the gold claws which form the feet of the lower stand are too small in scale and too weak-looking to harmonise with the other details. But in general this is a rich piece of work, and the drawing (full-size) is very carefully executed.

1984. "Design for a Ceiling": Mr. Moyr Smith. This is an elaborate pen-and-ink drawing, which looks rather more like a design for the back of a book. It is carefully drawn, and contains a good deal of elaborate workmanship, but we can hardly think it merited its position. The large design which emanates from the centre and spreads over the whole ceiling to the centre of each wall is not very refined in character, and from its nature must have a tendency to lessen the scale of the room to which it is applied; and the border which it overlaps, and which is continued round in the angles of the ceiling, is of so different a style and scale that they seem to belong to two different designs.

#### FRENCH ART AT THE PARIS EXHIBITION.

It is hardly possible to take any complete view of the immense collection of pictures and sculpture at the Paris Exhibition. Sculpture, besides the exhibits in the great Sculpture Hall, is scattered all about the grounds and terraces, often without name or catalogue number. The collection of paintings, large as it is, is more systematically arranged and more accessible, and as far as the French paintings are concerned it has been completely catalogued, though the difficulty of studying the collection of making any memoranda about it is much increased by the exasperating system (for it can be called no less) which the French persist in, of hanging pictures in no sequence as to the numbering, so that one has to be continually turning the leaves of the catalogue backwards and forwards for the names of works that are hung close together on the walls. With this method of hanging it is impossible to study groups of pictures according to any system, as it is impossible to tell where to find any picture that is named in the catalogue; and one can do so to make desultory notes of what is seen. It is astonishing that people who are so methodical in many ways as the French are, should be content to arrange public art exhibitions so that no one, except by the merest accident, can find anything that is named in the catalogue!

One general reflection results from the examination of the collection here, that the country of Rousseau and Dupré, Corot and Daubigny, is no longer taking an important station in landscape painting, and that in that branch, at all events, we are far ahead of France at the present moment. In the large collection there are few landscapes to be seen that are of much interest, and, as far as we saw, not one that would rank with the best works of such painters as Mr. Alfred Hunt, Mr. Henry Moore, Mr. Hook, Mr. Brett, and several others who might be named. There is a new school of French artists, the "plein air" men, who give a great look of sunshine and daylight to their scenes, but none of these are pure landscape-painters; their works are mostly large canvases in which cattle or figures, life-size, are treated in combination with a foreground landscape. In pure landscape there seems to be in French painting to-day a curious want of the light and atmosphere of nature; and perhaps the rather extravagant protest in the contrary direction of the small band of "impressionist" landscape-painters, who seem to endeavour to paint effects of light and nothing else, may not be without its value; it is at all events calling attention to a phenomenon in nature which the average French landscape-painters of the day seem content tranquilly to pass over without notice.

Another noticeable feature in every large collection of modern French paintings is, of course, the great size of a large proportion of the canvases, as compared with what would be met with in any English collection of a similar nature. Two influences perhaps combine to lead to this frequent employment of large canvases. One, for which the French are to be envied, is the amount of direct commissions and indirect encouragement given by the State authorities towards the production of large decorative paintings for public buildings. It is true that the work produced under this encouragement has not always been of the highest

type; but a great deal of fine work has been done, and there is at all events the fact remaining that in France there is the desire on the part of the Government to give liberal encouragement to art in this way—the conviction that public money so spent is well spent, followed of course by a corresponding interest in decorative art on the part of the people, who are constantly seeing it put before them; whereas in England the execution of the two decorative paintings by Sir F. Leighton at the South Kensington Museum is all we have to show in that way for many years past, and that was so rare an event that the English public hardly comprehend why such a thing is done at all, and look upon it as a kind of curiosity. In France the public are habituated to the idea that a public building is not really and worthily complete till it is decorated with high-class paintings; and of course the difference which this one fact makes in the public estimate of the value of art must be very great. In England the Government plays towards art the part of Mephistopheles: "I am that which says no to everything." One of the positive results of the French official encouragement of art is seen in such a work as the grand triptych\* by M. Benjamin Constant, "Les Lettres," "L'Académie de Paris," and "Les Sciences," intended for the illustration of the New Sorbonne, which stretches right across one of the large rooms in the Exhibition picture galleries, and is one of the finest and most effective decorative paintings that has been executed in modern times. Another influence in France, the favour of large paintings is no doubt, the great size of the galleries available for the annual exhibition which answers to our Royal Academy Exhibition. Some of the pictures in the *Salon* could hardly be got into any room in the Royal Academy; at all events a very few of the size that is common enough at the *Salon* would go far to fill the Burlington House rooms. But at the Palais d'Industrie the wall space available is so large that size hardly counts as any obstacle to the acceptance of a work. The influence of this large field for hanging is not altogether good. In some instances, no doubt, there is a great effect of reality given by having everything the size of life. In the present year's *Salon*, for instance, there is an immense painting showing a boat taking people away from a disabled ship in a heavy sea, the spectator being on a level with the boat, while a portion of the hull of the great ship towers above him on the right. The picture is executed with a great deal of truth, and the effect of this large scale is almost as if one saw the scene itself; it seems at any rate to produce an effect which a painting on a smaller scale could not. But in a general way this spaciousness of the *Salon* seems to lead a good deal to the painting of cabinet pictures on a magnified scale, and we fear it must be added, to a good deal of coarse execution. In fact, paintings on a small scale and with delicate detail seem to be completely killed in the *Salon*.

This tendency to very large, —unnecessarily large,—painting, is fully exemplified in the collection in the Exhibition Galleries, where there are many works which occupy an amount of wall space which, to English ideas, appears quite out of proportion to the nature and treatment of the subject. This may be said of even some of the best pictures there, such as M. Duez's moonlight landscape with cattle, a scene beautiful in its simple truth of natural effect, but which might certainly have been presented with equal effect on a canvas of half the size. The same might be said of M. Roll's immense painting of "Le Travail: Chantier de Suresnes," an interesting work in many ways, partly as an example of the interest which French painters of this generation are beginning to take in the working man and his life as a subject for art; the figures of the men are characteristic and of no little interest; but the large expanse of grey colourless canvas representing nothing but earth and stones and the debris of a building-yard seems an unremunerative employment of pigments. The case is far otherwise with such works as the large Oriental interiors of M. Benjamin Constant, "Les Chérifas" and "La Justice du Chérif," in which the colour effect on every portion is so sumptuous and effective that the pictures are a pleasure to the eye and imagination merely as symphonies in colour: the drawback to these

is rather that their intellectual interest is of so low a kind; otherwise these pictures entirely justify their scale.

M. Tattetgrain is one of the most thoughtful and intellectual of the more recent French painters of the day; his pictures show always a desire to go beneath the mere superficial qualities of execution in painting,—to illustrate an idea. His "Les Deuillants" represents two or three mourners and a priest with a crucifix, who have waded waist-deep into the sea to meet those who are bringing dead bodies in from a wrecked coaster: the subject is treated with a simplicity which is more pathetic than any elaboration of grouping could be. The same painter's representation of "Les Casselois à Mer" devant Philippe le Bon," a crowd of wretched people, amid a wintry wind, half-crouching on the ground before the conqueror and his mounted troops, is another work quite out of the ordinary category of battle pictures of the kind. M. Roll, to whom we have before referred, is largely represented, partly by pictures of rustic personages treated with great insight into the type represented, as in "Manda Lametrie, Fermière," a portrait almost as simple though not as powerful as those of Lepage. He is also represented by a good portrait of M. Alphonse. Among the paintings of scenes in humble life, the interest of which is a rather new discovery in French art (for Millet was quite before his time in this way), M. Renouf is good in his "Coup de Main," a child helping an old fisherman in rowing, and his "L'épave," a pathetic representation of a boy floating at sea with his arms over a spar and evidently nearly dead from exhaustion. A more poignant pathos pervades the picture by M. Deschamps, "Vu un jour de printemps," a wretched interior, with a dead body on a mattress, and two or three starving children, a single flower seen through the window suggesting the contrast with the life and happiness of spring. M. Humbert's "Maternité," a triptych showing a peasant mother with her two children in her arms in the centre and in the side scenes the one dead as a soldier, the other an over-worked farm-hand, is another of the class of works which owe their inspiration to Millet and Bastien-Lepage, those Carlylesque painters of popular suffering. M. Marco's "Un Lendemain de Payo" is another powerfully-painted work with a sombre moral. It may be said that the French, having neglected "les misérables" for a long time in painting, are now disposed to harrow our feelings with contrasts of the most painful description; there is something morbid in this, but it is at least not done in a commonplace manner. A more cheerful style of humble subject is M. Geoffroy's interesting work, "En Classe—Travail des Petits," a large painting of a number of children at school, highly-finished and with a great deal of special study of character in the heads. "Les Loups de Mer" (or "sea-dogs," to put it in English phrase), by Madame Demont Breton, an interior with a group of rough seafaring men, is another good work of this class.

M. Gervex, who appears to aim at the reputation of versatility, has had the good luck (if it was luck) to get all his principal works hung together at the end of one room. We have the now well-known picture of the members of the Jury at the *Salon*, that of Dr. Péan giving a clinical demonstration at one of the hospitals, a wonderfully clever thing, in the character and force in the head of the principal figure especially; a dressy portrait of a lady, balanced by a picture of a lady standing in a richly-furnished room with nothing on but a velvet mask over her eyes,—a picture that would send the "British matron" into hysterics with a good deal more excuse than any Royal Academy picture ever furnished; it is vulgar enough, certainly, and a poor piece of clap-trap at the best. His central work, however, a scene from De Musset's "Rolla," introduces nude painting in a very different sense, and is pathetic in sentiment as well as beautifully painted.

The painting of military subjects, for which the French have always had a predilection, could hardly be better illustrated than by M. Détaillé's fine picture, "Le Réve," the sleeping army behind its camp-fires, and the same artist's large picture of a cavalry regiment on the march, the "Cosaques d'Alman." These are far more real than some of the enormous battle-pieces full of horses prancing in theatrical attitudes, which are duly represented in the collection, but which belong to a taste that is fortunately dying out. Of the more or less

\* Illustrated in the *Builder* for Sept. 1, 1888.



idealised nude studies that always fill a considerable space in a collection of French pictures, there are some splendid examples, as far as regards execution, though few that show much of the poetic feeling which raises such works above the level of academic studies. Among the academic class may be rated all those by M. Bouguereau, and the earlier works by M. Lefebvre, such as "Diana Surprise," a class of work which, like the immense battle-pictures just alluded to, is comparatively at a discount now. In later works, such as "Psyche," M. Lefebvre has developed a really poetic treatment of nude figures, as also has M. Henner, though the most idealised works of the latter artist are not represented here. M. Benner's "Au bord de l'eau," two figures looking away from the spectator, is beautiful both in drawing and the Arcadian repose and simplicity of the composition; his "Le Repos" is also a beautiful figure, only marred by the cold green tone of the realistic landscape, which suggests a danger of rheumatism to the woman who reclines on the damp grass. The mere mastery of execution displayed in these works is, however, in itself worthy of the highest admiration; it does not raise them to the highest rank of painting, but it represents a power in the treatment of the figure which is hardly at present to be met with anywhere out of France. A comparison of these with a certain large painting of "Eve," now in the Royal Academy, is not calculated to gratify one's patriotic prejudices.

The collection contains some very fine portraits, a branch of painting in which contemporary French art takes a very high place, rather in the way of brilliantly-painted likenesses than of that kind of picture-making out of portraits, to which some able English painters are so much addicted. We see a few instances of this, however, as in M. Duez's portrait of M. Ulysse Butin, the sea painter, who is represented at his easel by the margin of the sea (which, by the way, is very badly treated), and in M. Eugène Carrière's portrait of "Louis Henri Deviller," a large studio interior with the figure of a painter and his dog in front and in the background a model making preparations for sitting. This picture is not only one of great vigour and individuality of character in the principal figure, but is noteworthy also for a peculiar technique, a method of giving everything in a soft, rather veiled manner, with no marked definition of outline: a quality illustrated also in the same artist's large picture "Premier Voile." In strong contrast is M. Léon Comerre's brilliant realistic portrait of M. Larroumet, the present Directeur des Beaux-Arts under the Municipality, dressed in his robe of office, in which a brilliant orange is the prevailing colour, which the painter has represented in all its force though without hardness. Of similar uncompromising brilliancy is M. Agache's painting (evidently a portrait, though not called so) a woman in a black dress seen against a background of strong red, and entitled "Enigme." M. Bonnat has a sumptuous portrait of Cardinal Laviege, in his state robes, which belongs to the same class of work. There are various portraits by M. Carolus-Duran, of which the finest are "Portrait de M. Z—" and the charming portrait of a young dark-haired girl seated, which was in the Academy two or three years ago, and was said to be the painter's daughter, but she appears here as "La Fille de M. Louis S—," M. Delhumeau exhibits a remarkably fine "Portrait of M. de Mendon," a painting of an old lady, which is more English in style and treatment than most of the portraits here, and rather recalls some by Sir John Millais. A portrait by M. F. Joseph Lagrand, of "M. de S—" (in Paris people whose portraits are exhibited do not seem to have that desire to advertise their names which is obvious in London) has a remarkable though rather mannered dignity about it, somewhat recalling M. Carolus-Duran.

Among figure-subjects we may call attention also to the fine work by M. Brouillet, "Le Paysan Blessé," a life-size group very finely composed, where a wounded labourer is being carried into his house; to M. J. E. Saintin's small but pathetic work, "Dernière Prière," where figures are kneeling near the door of a sick room praying for some sufferer who is not seen; M. Aublet's "Autour d'une Partition," a very good specimen of the painting of indoor every-day life, and M. Jules Garnier's interesting picture of Gambetta addressing the Chamber, under the title "Le Libérateur du Territoire,"

which has a certain value also as a portrait-record of the French politicians of the time represented.

In still life we see some very fine things, remarkable for a largeness of style and handling, and even of actual size, such as we never see in England in this class of subject. M. Fonce's two pictures, a "Coin d'Office" with oysters and brazen pots, &c., collected, and "Les Confitures" where a sugar-loaf and various delicacies of confectionery are given quite an artistic interest, are admirable works of their kind; so is M. Claude's "Chez la Crémère" which is perhaps even finer; and M. Quost's "Lauriers Fleuris" is a magnificent piece of flower-painting; as also M. Jeannin's "Jardinière des Fleurs." In England we do these things in rather a *petite* though highly-finished manner; the breadth and brilliancy of these French still-life works we do not seem to reach, partly because we only paint such things on a small scale. Of course it may be replied that they are not worth doing on a larger scale, and no doubt these works are only pictures *de l'usage*, such as fill up the wall-space of a large mansion; but it is good to see anything first-rate of its kind. In landscape, as we have observed, it is all the other way. The painters of to-day seem to have retained something of the feeling for landscape composition which marked the school of Diaz and Dupré, but to have lost the light of day out of their pictures. Such a scene as that of Mr. Johnston's in the Royal Academy, where you feel as if you could wade in the clear pool in the centre and follow up the path leading away under the trees, seems impossible at present in France. The few pictures that show a little daylight are among the works of painters who seem to have attained a special faculty for painting certain small corners of the world, as in M. Gagliardini's bright little village street scenes, diversified in more than one case by the study of a manure heap, sometimes as a foreground object, sometimes in the middle distance. M. Binet's "La Plaine, St. Aubin-sur-Quillebeuf," is a fine composition of expanse of plain and expanse of sky, with distant woods making a slightly undulating horizon line; this is a kind of thing that the French understand the charm of as a matter of composition; but of local colour and light it is innocent. Among the few works we noted as exceptions were M. Dameron's "La Nuée qui Monte," M. Delpy's "Crépuscule après l'orage," M. A. L. Demont's "Fiançailles," where two dimly-seen figures are looking over a twilight landscape; M. Laurens's "Châtaigniers de Marly," M. Maillard's "Les Derniers Secours," a fine sea piece, and M. Thiollet's "Le Côte Normande," in which, however, the sea is not good. In sea painting, generally speaking, it appears to us that the French artists of the day are absolutely nowhere beside such painters as Messrs. Moore, Hook, Shaw, and Fraser, beside the best works of any one of whom a French sea hardly looks like sea at all; it has none of the salt breeze about it. In paintings in which cattle are combined with landscape, on the other hand, the French seem to retain and even surpass the traditional force and brilliancy which characterised Troyon and others in a former generation: M. Guignard's "Au Verger," a peasant with a calf, is superb; so is M. Jacques's "Le Retour du Troupeau" and M. Barillot's "Les Etangs de Saint-Paul de Varax."

The "Exposition Rétrospectif," in the central hall and two of the side galleries on the upper floor of the Beaux-Arts Section, is not an exhibition of works of deceased French artists only, but a kind of continuous exhibition from 1789 to 1889, including some of the most recent French works, though it does not appear exactly on what principle living artists have been selected to figure in this portion of the Exhibition rather than in the general Beaux-Arts collection. The study of the older works of interest now. Paintings like Couture's large picture of "Les Romains de la Décadence" and Delacroix's "Battle of Taillebourg" seem to indicate that the French painters of that day were much more theatrical and unreal in their manner of depicting what were supposed to be historical scenes, but also much finer colourists than their successors of to-day. The French, indeed, seem to have been losing colour while we have been gaining it. The Taillebourg picture, however, admire the colour and vigour of design as we may, looks absurd in conception from to-day's point of view. Delacroix's "Liberty guiding the People" is a fine work, which only puzzles one as to whether

it is or is not meant as a satire. As a battle-piece Bellange's picture of a charge of Kellerman's cuirassiers, a picture crowded with small figures, is much more like a battle than Delacroix's, and more in the modern spirit. Horace Vernet's large picture of the "Prise de Constantinople," an assault by escalade, is a vigorous and energetic piece of its kind. It is sad to attend at the grave of a lost reputation, but we fear it is little better than this to look at the large, hard, academical works of Ingres, which only serve now to raise wonder at his former reputation. Louis David still shows well, as in his well-known portrait of "M. de Recamier" and his picture of "Galileo before the Inquisition." Regnault's splendidly energetic picture of General Prim on a black horse forms one of the most striking exhibits in the great hall; and not far from this is an exquisite little picture by Gustave Moreau, of "Galatea," a nymph seated under water, amid a perfect jewellery of coloured sea things, "rich and strange," a medley of living gems; a work which recalls some of the best achievements of our former Pre-Raphaelite school. Courbet, the painter who gained an additional fame, of a kind, as the chief inciter of the pulling down of the Vendôme column by the Communist mob, is largely represented in these galleries, by works which, though no one of them is perfect in itself, evince, when taken together, a remarkable versatility of power. Among the other deceased painters who are more or less well represented are Troyon, Handry, Dupré, Corot, and Millet. Meissonier is represented by his well-known painting of Napoleon on the retreat from Moscow, and other smaller works; and in the first-floor gallery of the Modern Beaux-Arts Collection is to be seen his large and splendid water-colour "1807," showing one of Napoleon's cavalry regiments riding past him to make a charge; the work which was exhibited for the first time in London last year.

The crowd of sculpture in the sculpture hall, amid a good many things of mediocre interest, contains some very fine works; among them the cast of M. Matarin Moreau's grand work, "Exilés," a group of an old man of noble presence, and a nude youth standing turned towards him in sympathy. This stands not far from the entrance from Avenue Rapp, facing towards the entry, and is a thing no one should miss seeing; it is one of the few modern pieces of sculpture which reaches, in its conception, the highest intellectual interest. A general view of the sculpture gallery suggests the idea that there has been a desire to show into how many possible attitudes the nude female figure can be twisted, and many of these works are distinguished much more by a kind of supple cleverness of execution than by any higher qualities. Fine things may be picked out from among them, however; M. Hector Lemaire's "Rêve d'Amour" for instance, a woman seated and leaning back to listen to a little Cupid, is very graceful in feeling and composition. M. Delaplanche's "Circe" is a finely-modelled figure with a countenance very expressive of its intention. By M. Dalon there is a remarkably large alto-relief of the same subject as that of Delacroix's picture just referred to, the scene of Mirabeau and De Brézé. There is a great variety of character in the faces, but the Mirabeau is by no means equal in energy and originality to that of Delacroix. M. Chape is represented by, among other things, a fine fully-draped statue of "La Peinture," heroic size, and a charming portrait-statue of a boy, "Statue du Jeune Desmarres," showing what a great sculptor can make of a portrait-statue in ordinary costume. A similar kind of success is shown by M. Laoust in his admirable figure of Lulli, the musician, as a boy, playing the violin, with face upturned with a rapt expression of enjoyment; this is one of the new works exhibited which are marked as "purchased by the State," an indication that is alone sufficient to tell us that we are not in England. M. Béguine's graceful figure called "Charmeuse," a young nude girl stooping forward and playing on two pipes, is a typical example of the peculiar kind of piquant fancy which we often meet with in French sculpture, and which is seldom seen in that of any other country at present. Another characteristic of French sculpture, not so pleasing, the taste namely for cruel and savage subjects, is in a sense well illustrated, especially by M. Fremiet's two groups, a gorilla carrying off a woman, and a man hugged by a bear,—"Ours et





*Residence at Jamaica Plain, Boston, Mass., U.S.A. - Mr. E. M. Wheelwright, Architect.*

homme de l'âge de pierre"; the former, which was in we think last year's *Salon*, is a wonderfully powerful work, especially in the action of the animal; but it is a kind of thing that would hardly be endured in England, nor can we think that English feeling is mistaken; the merely horrible is not the right province of art. M. Granet's "Jeunesse et le chimère," a youth bending over a Sphinx as if to ask her secret, is a fine thing, another example of that intellectual meaning of which in the best French sculpture we see more, certainly, than in our own. M. Mercié, perhaps the greatest sculptor the French possess, taking his work all round, is represented by a great patriotic group, "Quand Même," a woman snatching a musket from a wounded soldier to continue the combat; it is a striking work, but he has done finer things. Among his smaller works is a figure for a monument, "Souvenir," a woman, her features indicated as thinly veiled, reclined against a tomb; the face is singularly beautiful, and the indication of the veil, a

thing which has often been done as a mere trick of handling, is in this case only so slightly indicated as to add to the quiescent expression of the figure. Among others of the higher class of works may be cited M. Peintre's "Orphée endormant Caribée," a fine bronze work; and M. Pech's "Guido d'Arezzo," a seated figure of a monk playing on a primitive form of violoncello; the head is very fine.

By far the greater amount of the sculpture in the large hall is French, but there is a certain amount of Belgian work, including two or three fine things. Of these and the Belgian and other paintings we may give a few notes on another occasion.

#### RESIDENCE AT JAMAICA PLAIN, BOSTON, MASS., U.S.A.

THIS residence, built for Mr. A. Bowditch, is another, and rather larger, specimen than those we illustrated last week of some picturesque American country-houses, which,

though evidently greatly influenced by English work, have really been developed from the settlers' houses of the earlier period. This origin may be traced in the weatherboarding still so largely used, and in the prevalence of broad, low roofs, as well as in many arrangements of plan. The influence of the climate is seen in the verandahs or "piazzas," and in the jalousies to nearly all windows; and the originality of American genius may be traced in the broken-up and often picturesque grouping, and in the peculiar mingling of a variety of materials and methods in the same building. Mr. Bowditch's house is described as having a brick and stone basement, a ground story faced with "moulded siding," and upper parts covered with shingles. Inside, the principal rooms, hall, and staircase are finished in hard woods, the bath-rooms in cherry, the kitchen in Georgia pine, and the rest of the house in "white wood" stained. The architect was Mr. E. M. Wheelwright, of Boston. The cost of the house amounted to 20,000 dollars.



## Illustrations.

## DESIGN FOR A MEMORIAL CHURCH.

**I**N designing the memorial church here illustrated, and adapting it to the site, advantage has been taken of the extreme variation of level to obtain a crypt beneath the chancel, wherein the family tombs may be placed.

The sketch plan exhibits the general arrangement. On the south side there is a morning chapel, and adjoining it, but at a lower level, the vestries are placed.

The nave aisles are narrow, and without seating, an arrangement which enables every one within the church to see the pulpit, and which, with the ambulatory round the chancel, readily adapts itself to processions.

A baptistery is placed at the south-west angle, and a gallery over the west doorway.

W. H. BIDLAKE.

\* \* Mr. Bidlake's drawing, from which the illustration is taken, is hung in the Architectural Room at the Royal Academy.

## CHENESITON HOUSE, KENSINGTON COURT.

THIS house is situated on Kensington high-road, facing the Gardens. The wide arched entrance at the side over which the drawing-room, extending along the whole front, is carried, leads to stables and court at the rear. The three windows next it light the library, and on the further side of the entrance is a large hall lighted by two windows. The elaborate railings of area and balcony are excellent examples of forged and beaten ironwork, executed by Messrs. Newman & Co. Messrs. Holland & Hannen were the builders, and the architect is Mr. J. J. Stevenson, F.S.A.

The drawing from which the illustration is taken is hung in the Architectural Room at the Royal Academy.

## DESIGN FOR A SMALL COUNTRY HOUSE.

THIS was designed as an example of a comfortable, simple, and economical house. The two plans appended to the sketch will best show the arrangement and intention. The ground-floor is intended to be of red brick, the first-floor story being covered with hanging tiles. There are good rooms in the roof, which is covered also with tiles. The sketch shows the garden front, and on the ground plan a lobby should have been shown to the garden door.

PHILIP J. MARVIN.

## WAYSIDE NOTES IN EAST ANGLIA.

A CORRESPONDENT of the *Builder*, in alluding to my sketches, made mention of two church towers of which I happen to have drawings, and thinking, perhaps, that they may be of interest, I have ventured to reproduce them, together with a few of their East Anglian kindred. Though there is nothing particularly striking in those that I have represented, yet, if for nothing else, they are interesting as illustrating how completely the materials and construction of churches depend upon their environment. Thus in the Eastern Counties we have almost every conceivable variety of material employed in the erection of the ecclesiastical buildings; brick where clay is abundant, as at Ingatesone, Fryerning, Layer-Marney, and many others; flint, almost universal throughout Suffolk, Norfolk, and parts of Essex; stone in the churches lying in the Thames Valley and adjacent to the river, and also in the grander and more elaborate buildings inland; and timber, as in the old church of Greenstead, Essex, one of the most curious in the county, where the walls are constructed of huge oak trees, sawn through and placed close together, framed and pinned into heads and cills, the rounded contours of the outside of the tree showing on the external face of the wall. Wood is also frequently used in Essex for the belfries, several of which are marvels of ingenuity of construction, as at Stook and Margareting; whilst at Shenfield the arcade which separates the nave and north aisle is constructed in wood, the piers being solid trees. Brick and flint, however, are the native materials, and stone was used, generally with a sparing hand, for quoins, windows and doors, strings and enrichments. Wherever flint was employed, it was almost a necessity to construct the angles of freestone, though at Beeston

Regis, Norfolk, and, I believe, in one or two other places, large flints have been used for the purpose, and the stone dispensed with. Another expedient to economise stone in flint towers, was to build them circular on plan. I may, perhaps, be pardoned for these few remarks, but I felt some slight apology was due from me in offering these few examples of church towers which, perhaps, from the absence of any striking features, do not deserve more than a passing glance.

Coming, then, to the examples delineated, I will give but a few brief notes of each. We have on the sheet a representative of each of the styles of Gothic, and one of Norman date, and here note the difference between the plain, square towers of Rawreth and Wenington, whose massive walls, unrelieved save by strings, needed no extraneous support; and the flint towers of Runtun & Bramford, the large buttresses of which were rendered necessary by the unsatisfactory bond of the material employed. In the former of the last two, the turret stair is one large buttress, and has a bold and imposing effect.

*Wenington*.—This little parish lies on the borders of the Thames, about eighteen miles from London, in the midst of low-lying marshlands. It was called in Domesday Wentuna, also Wuntune, and Wenitun. The church, dedicated to St. Mary, stands high above the village, near the Hall, and consists of a nave, north aisle, and chancel. At the west end stands the square tower, and its architecture, though belonging to the richest period of Gothic, does not exhibit the slightest trace of carving or elaboration. The proportions, however, are good. There is a curious monumental tablet to the Rev. H. Rust, with this inscription, in a mixture of Latin and English:—

"Here lies interred both father and sonne,  
For death is decreed for old and young."

Hodie sumus

Cras erit in vili putre

Cadaver humus.

An age of cares, a world of sorrow,  
Alive to-day, and dead to-morrow."

*Rainham*.—Two miles nearer London than Wenington, and situated in the Thames Valley, is the goodly village spelt variously Rainham, Rayneham, Reinham, and in Domesday Reneham. The land is very fertile, and the soil produces good crops. The River Ingreburne here assumes navigable proportions, and wharves line the stream throughout the place. The church is well worthy of attention, dating as it does from Norman times. It has a double dedication,—viz., to St. Helen and St. Giles,—which is, I believe, an almost unique combination. Its founder appears to be Richard de Lucy, who gave it to the Abbey of Lesnes, in Kent, which endowed a vicarage, but retained the great tithes. The Abbey had the advowson till the Dissolution, when it was granted to Cardinal Wolsey, on whose downfall it passed through the hands of numerous proprietors. The church has nave, chancel, north and south aisles, and a massive tower at the west end. We see undoubted signs of its Norman character in the massive piers dividing the nave and aisles; in the beautiful priest's door, richly moulded and enriched with chevrons, and, lastly, in the tower, with narrow slit windows, circular-headed, and the quoins constructed of Roman bricks. The parapet of the tower is much later, as is also the spirelet roof. In Edward III.'s reign there was a chantry, founded by Sir John Staunton, in the churchyard, to secure prayers for his family and Alice his wife, and also for Isabel, mother of the King. The chapel was dedicated to All Saints, but the supply of money requisite for the proper support of it coming short, it was dissolved in 1521 and converted into a free chapel, in charge of a layman, unmarried.

*Rawreth*.—This ancient parish, situated on the high uplands overlooking the Thames, though not mentioned in Domesday, and of which no records are extant till about 1200, was the seat of a Roman occupation, as evidenced by the coins and pottery and urns of calcined bones that were found lying in a trench in the neighbourhood. The name is variously written Raureth, Rawreth, Ragee, Ravee, Raurith, Raurere, Ragerin. The church, dedicated to St. Nicholas, which was practically rebuilt in 1823, except the tower, consists of nave, chancel, and south aisle, belonging to Beches Manor, on whom devolves the reparation. On the east wall of the south aisle is an ancient tablet to the Tyrell family, consisting of a

panel, circular-headed, in which are two kneeling figures in incised brass, with inscription underneath and three coats-of-arms over. In the churchyard is buried Thomas Purchas, forty-five years vicar of the parish, related to Samuel Purchas, author of Purchas's "Pilgrimage." In the chancel is an old gravestone having on the dexter side the arms of England and France quarterly, and on the sinister side an eagle, displayed in the middle an escutcheon in two parts.

*Runtun* is a picturesque Early English church on the coast of Norfolk, about two miles from Cromer.

*Great Waldingfield*, in Suffolk, is about three and a half miles N.E. from Sudbury. The church, dedicated to St. Lawrence, is a rubble building, principally in the Perpendicular style, with a Decorated chancel, restored in 1869.

Bramford I noticed in my last list of sketches.\*

JOHN S. CORDER.

## THE HISTORY OF HUMAN DWELLINGS: SKETCHES AT THE PARIS EXHIBITION.

FOR an account of the illustrative buildings represented in this sheet of sketches and in the similar sheet which we gave last week, see our first article this week.

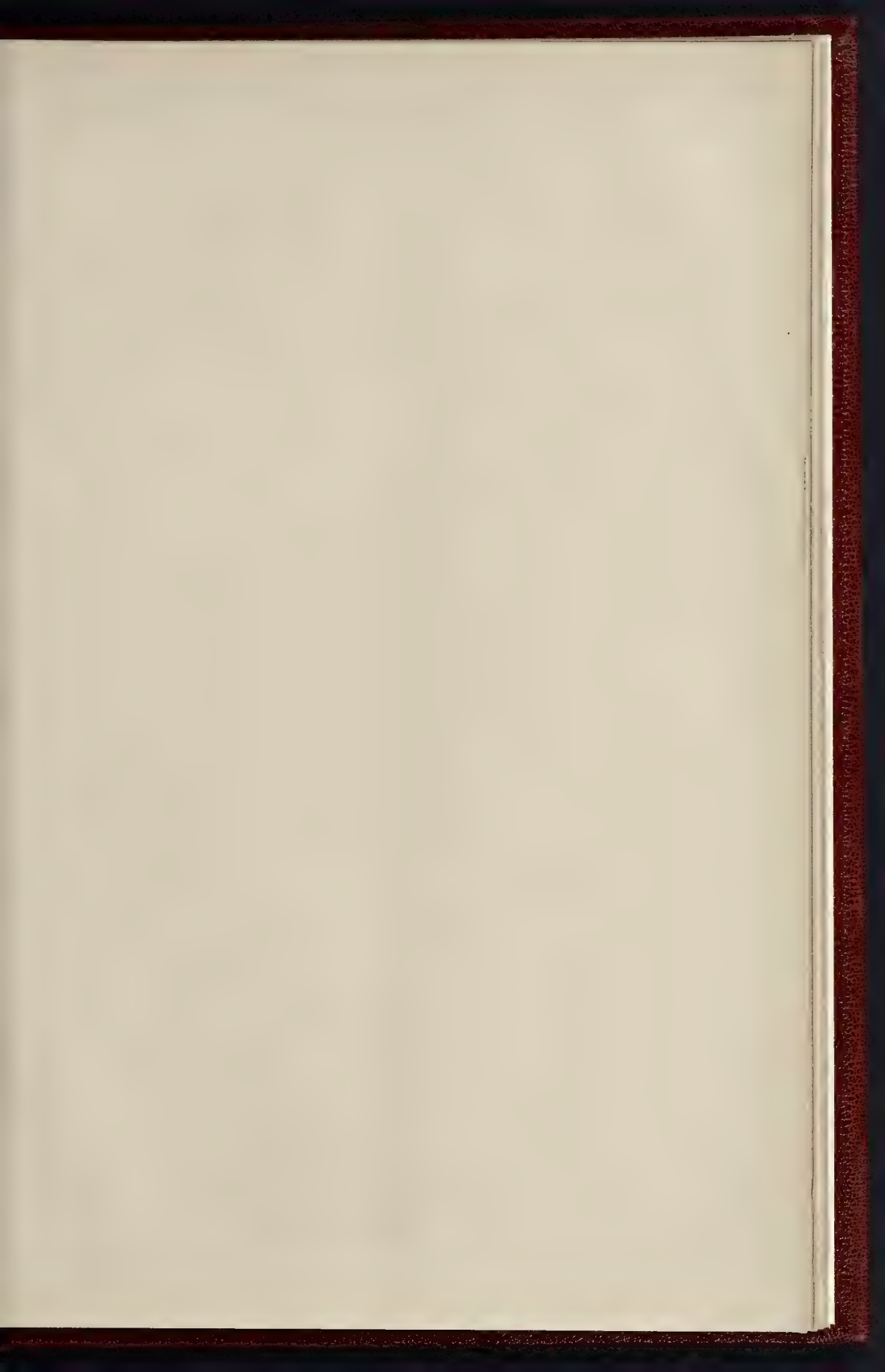
## SANITARY LEGISLATION IN REGARD TO DWELLING-HOUSES.

THE owner and occupier of a house equally desire that it be in good sanitary condition. When that is known, it is satisfactory to the tenant immediately, and not less so, though less immediately, to the owner. To secure a tenant, especially a good tenant, a house-owner will readily lay out a few pounds in decoration or fixtures, and he is equally ready to do what sanitary work may be necessary, providing he knows for certain what that is, and at about what cost the expense will end; and it would be a distinct advantage to him to be able to show to an intending occupier that the house is in a satisfactory sanitary condition, structurally, by producing a certificate to that effect, given by an undoubted authority. Much, of course, depends on this. The drainage of houses and their supply of water have become an almost separate branch of practice. In the Student's Column of this journal we have recently given a brief outline of the various Acts of Parliament which have been passed in behalf of the public health, so far as that is controlled or influenced by works of this character, and we would refer our readers to that Column rather than recapitulate those measures here. Let it suffice to say that legislation in this behalf has greatly altered the conditions under which houses must now be built and maintained. All the money that a man can afford to lay out on a house cannot now be devoted to external adornment, but a sufficient part of it must be laid out in making the house healthy. At present, however, there is no direct way by which the structural sanitary condition of a house already built can be known other than that of employing a qualified person to make an examination as occasion may require. But as, in many cases, this information is desired at once, this course cannot always be adopted, and, generally, it remains altogether uncertain whether a house is or is not in a satisfactory sanitary condition, structurally, having regard to its drainage, water-supply, &c.

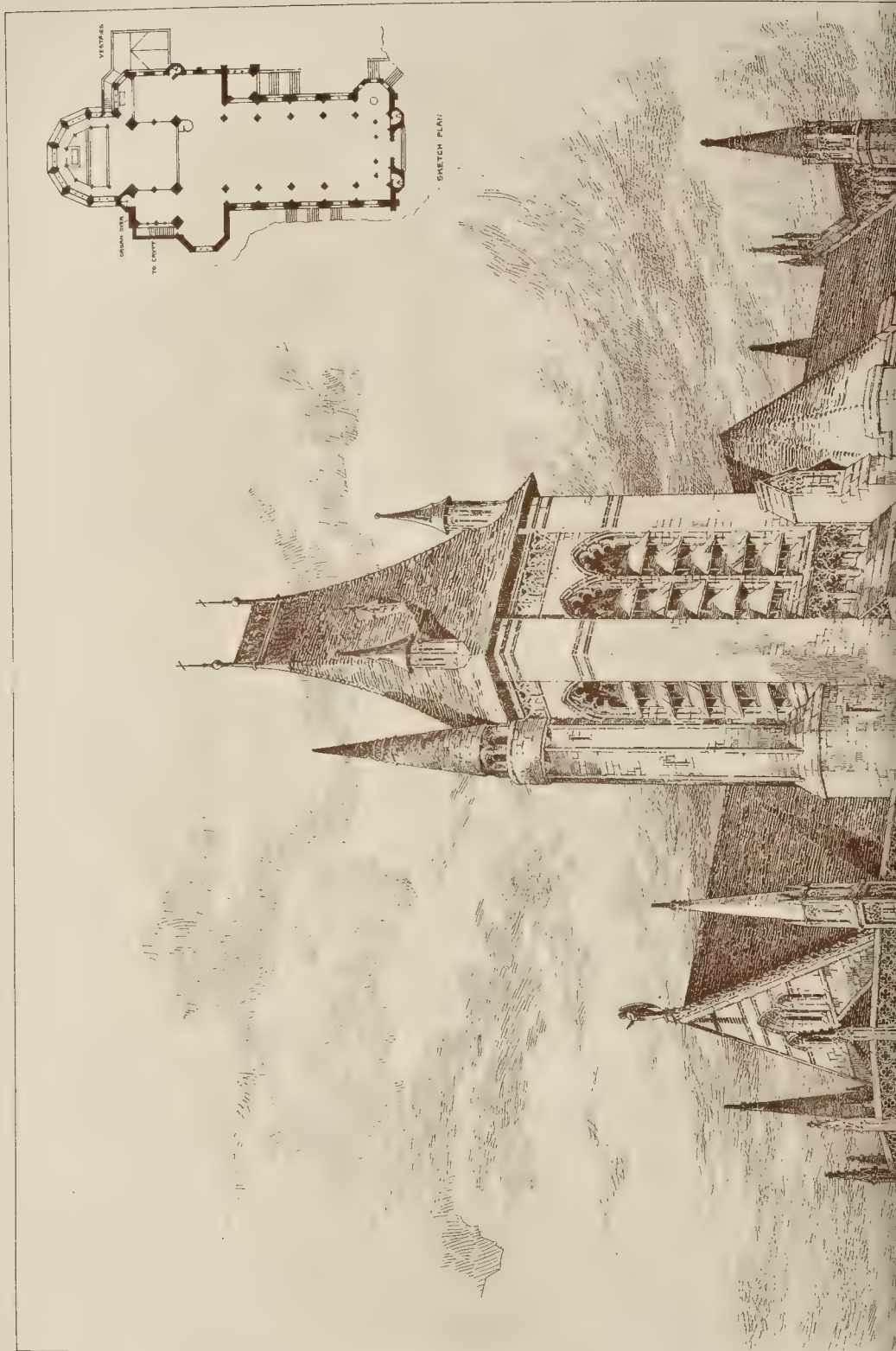
A Bill which has been introduced into the House of Commons proposes to enact that every water-closet in a house or other building shall have a flushing service which shall be distinct and separate from every water service other than a water-closet service, and that no cistern shall be connected with any pipe which is in direct connexion with a soil-drain. Secondly, that each soil-pipe shall be ventilated, and that the open end of the ventilating-pipe shall be at least 2 ft. above the highest window or other opening on the side of the building where the pipe is situated. Thirdly, that the drains shall be ventilated by means of a soil-pipe or by a separate pipe above the highest window on the side of the building where the pipe is situated. Fourthly, that water-closets shall be trapped, and that they shall be the only arrangements inside the building having pipes directly connected with a soil-drain; and, Fifthly, that there shall be

\* See *Builder*, March 23 last.





THE BUILDER, JUNE 22, 1889.



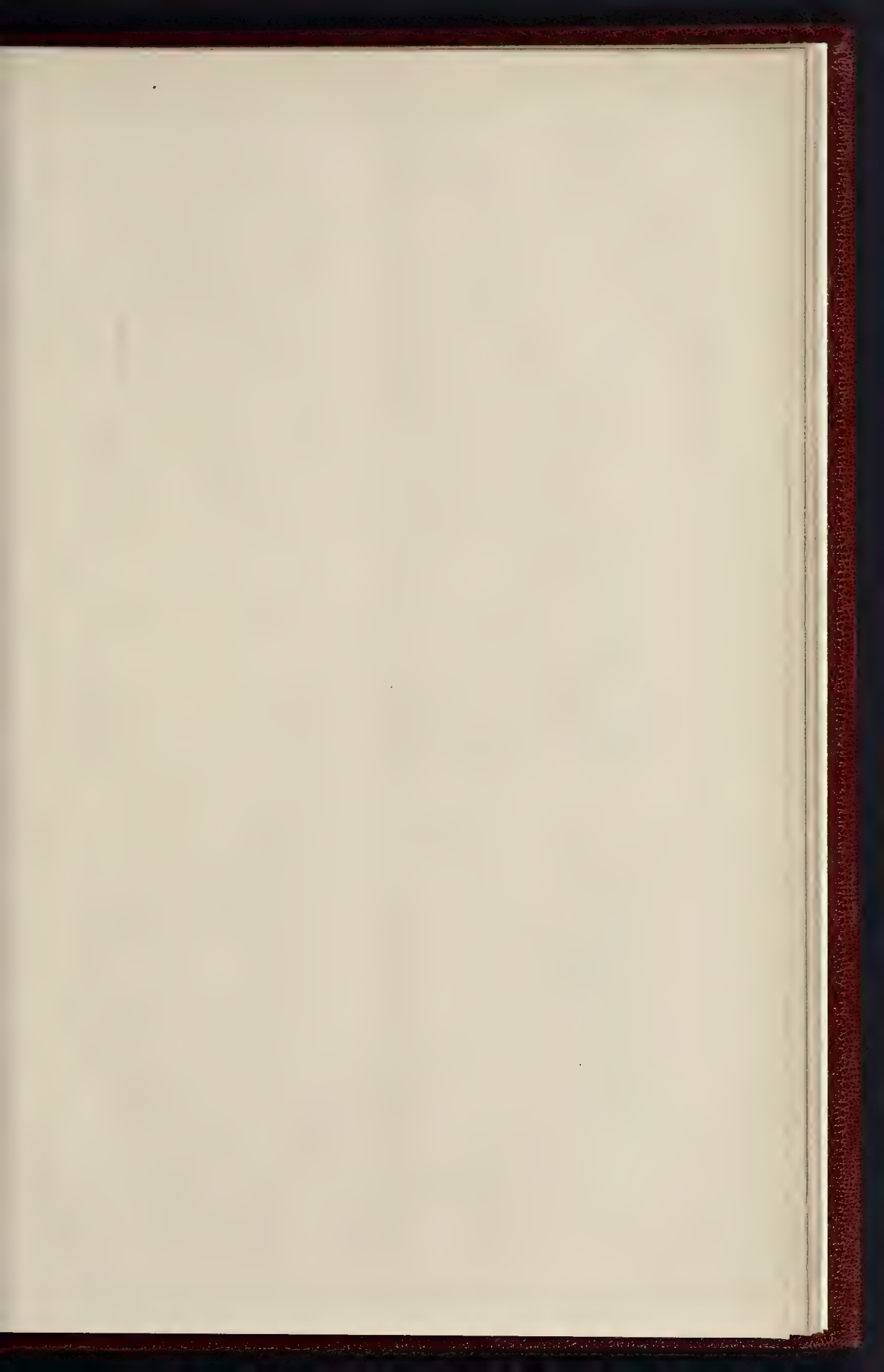




DESIGN FOR A CHURCH.—MR. W. H. BIDLAKE, M.A., ARCHITECT.



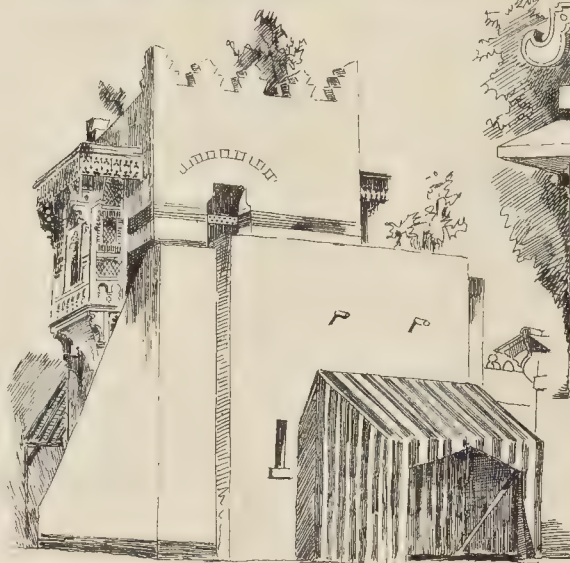




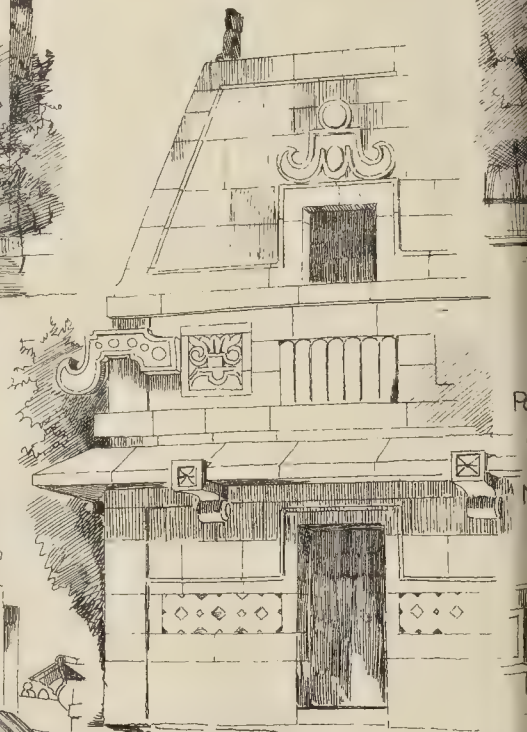
Renaissance  
House  
Sixteenth Century.



Medieval House - 13th Century



Arab House - Eleventh Century.



The Paris Exhibition  
Buildings illustrating  
the History of  
Human Dwelling

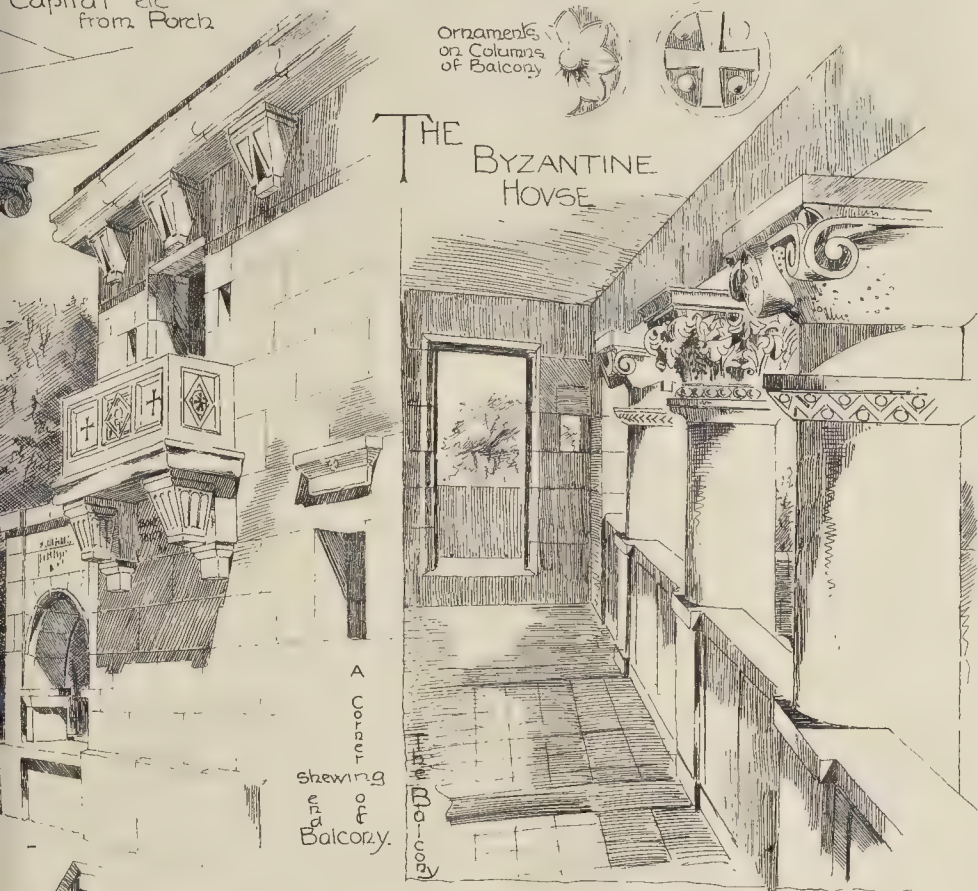


Capital etc  
from Porch

Ornaments  
on Columns  
of Balcony



# THE BYZANTINE HOUSE

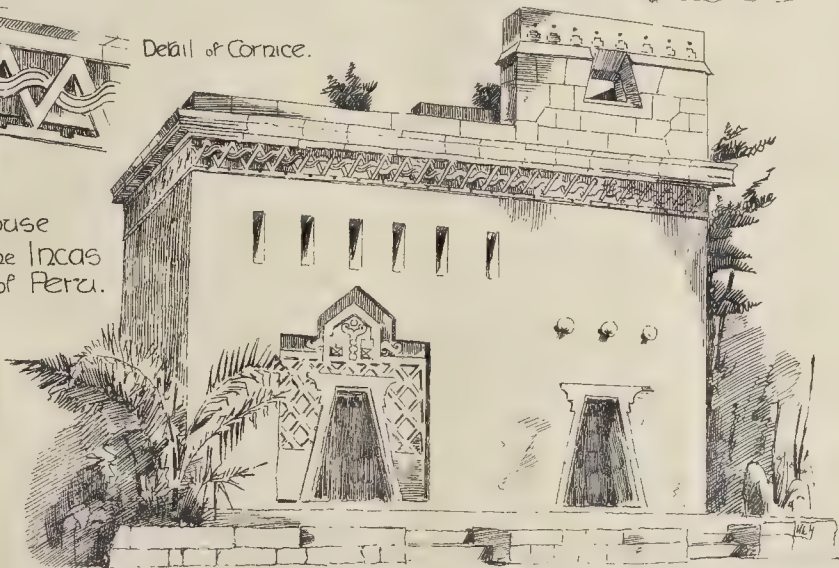


A  
Column  
showing  
of a  
Balcony.

Detail of Cornice.

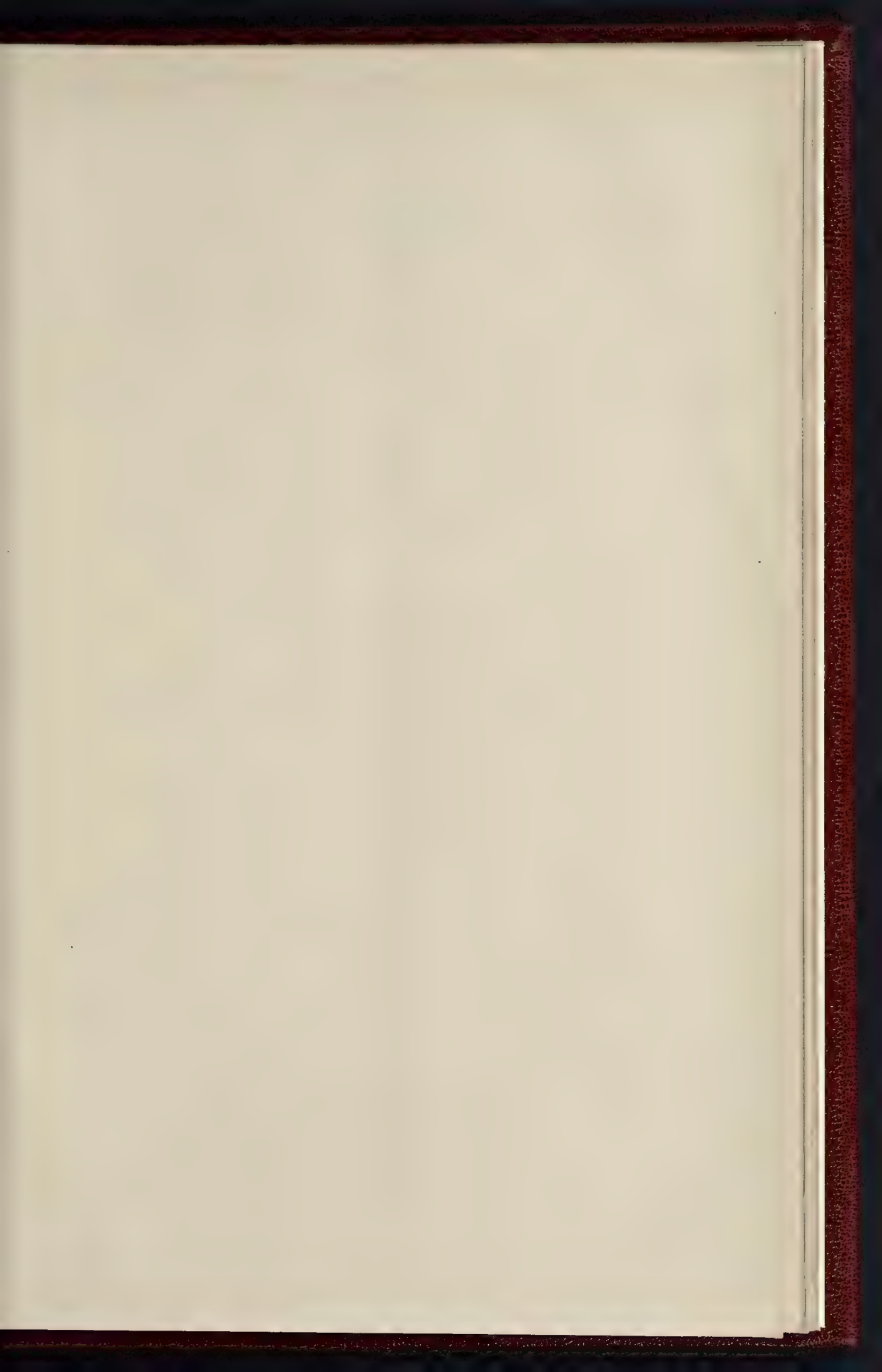
House  
of the Incas  
of Peru.

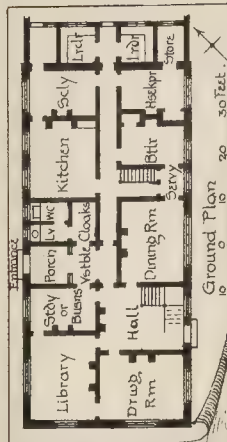
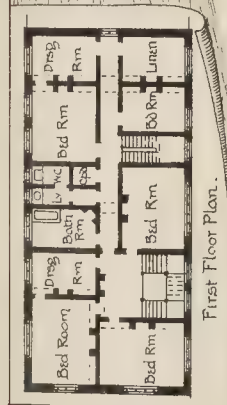
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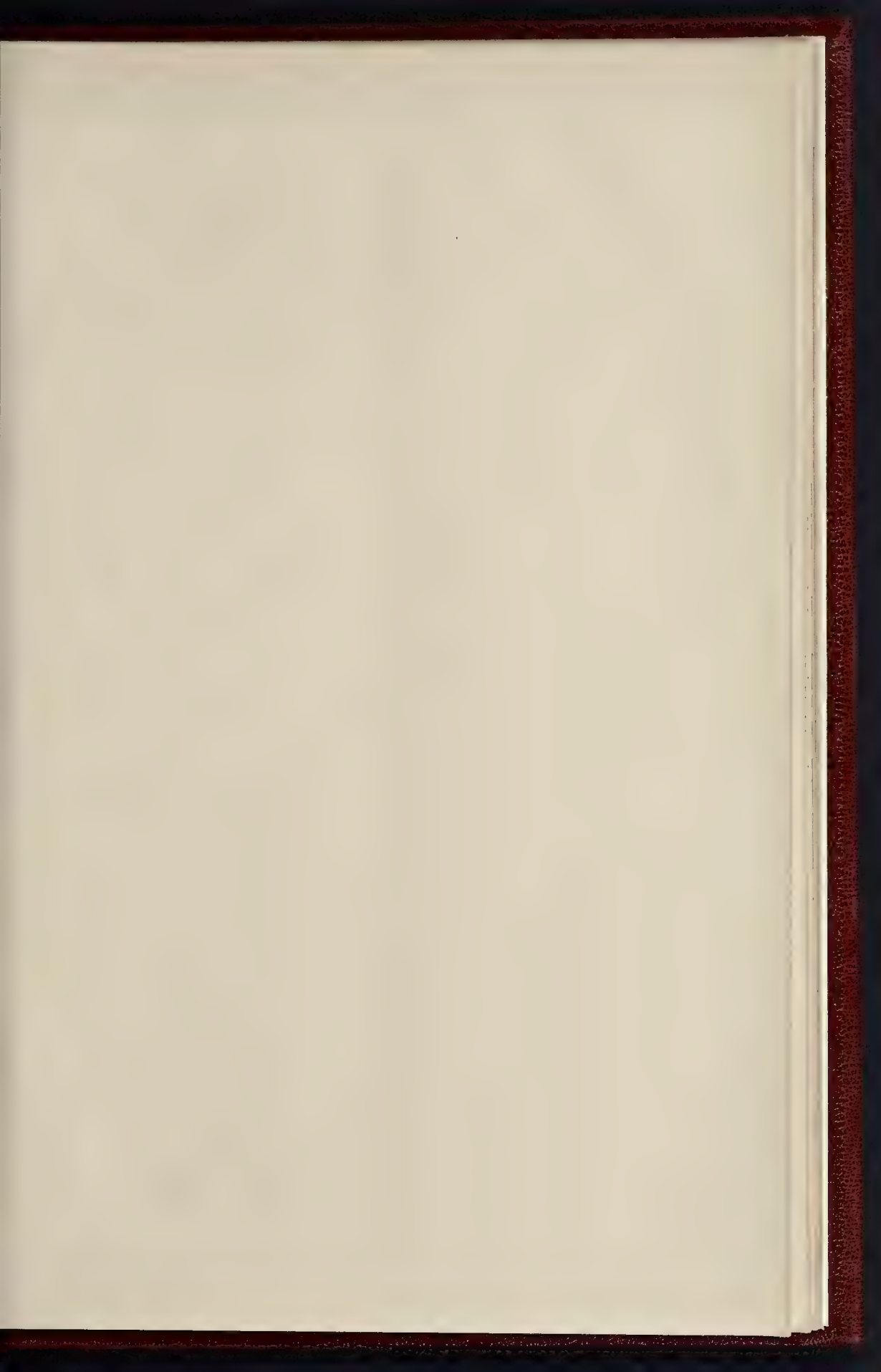




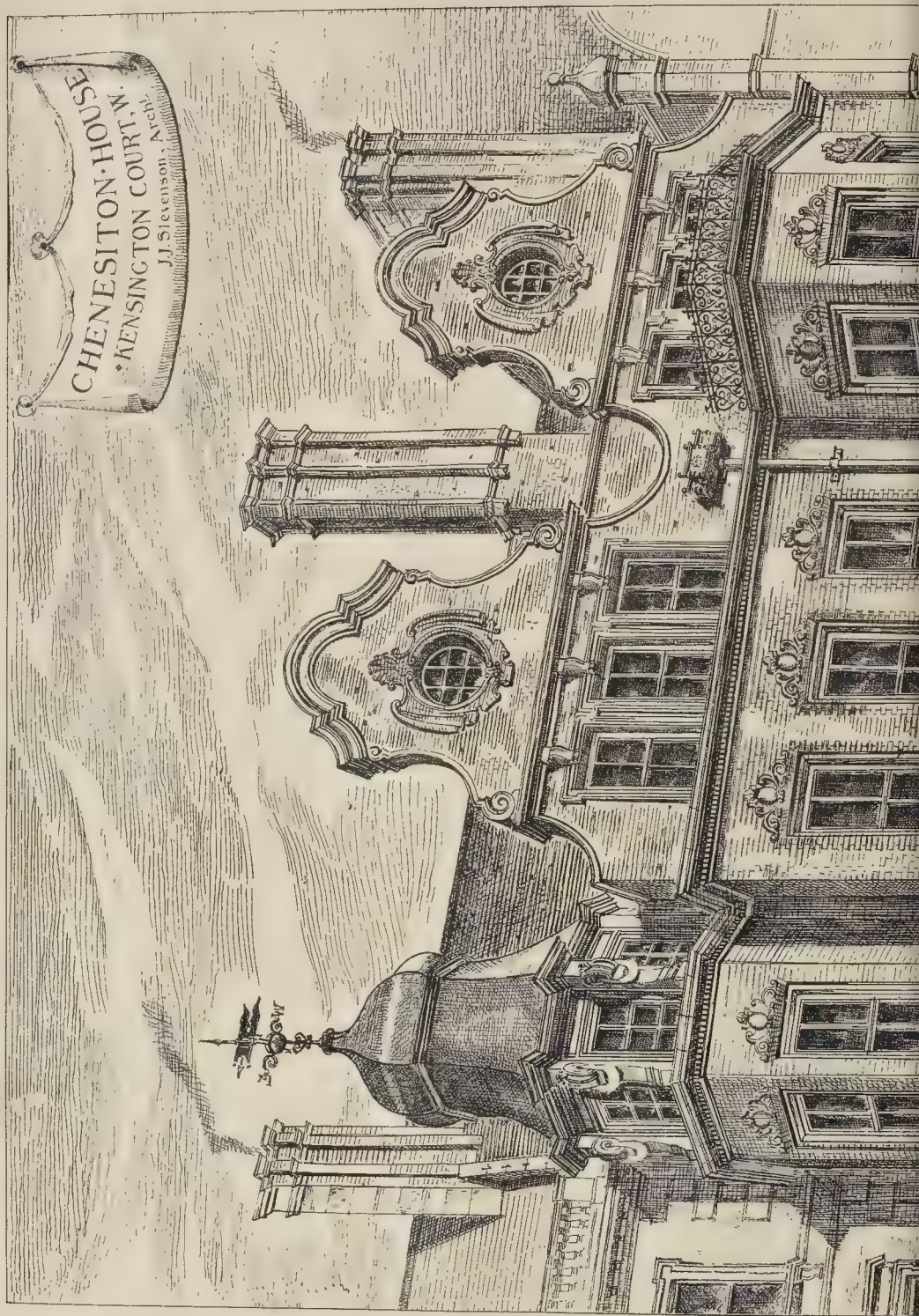


THE BUILDER, JUNE 22, 1889

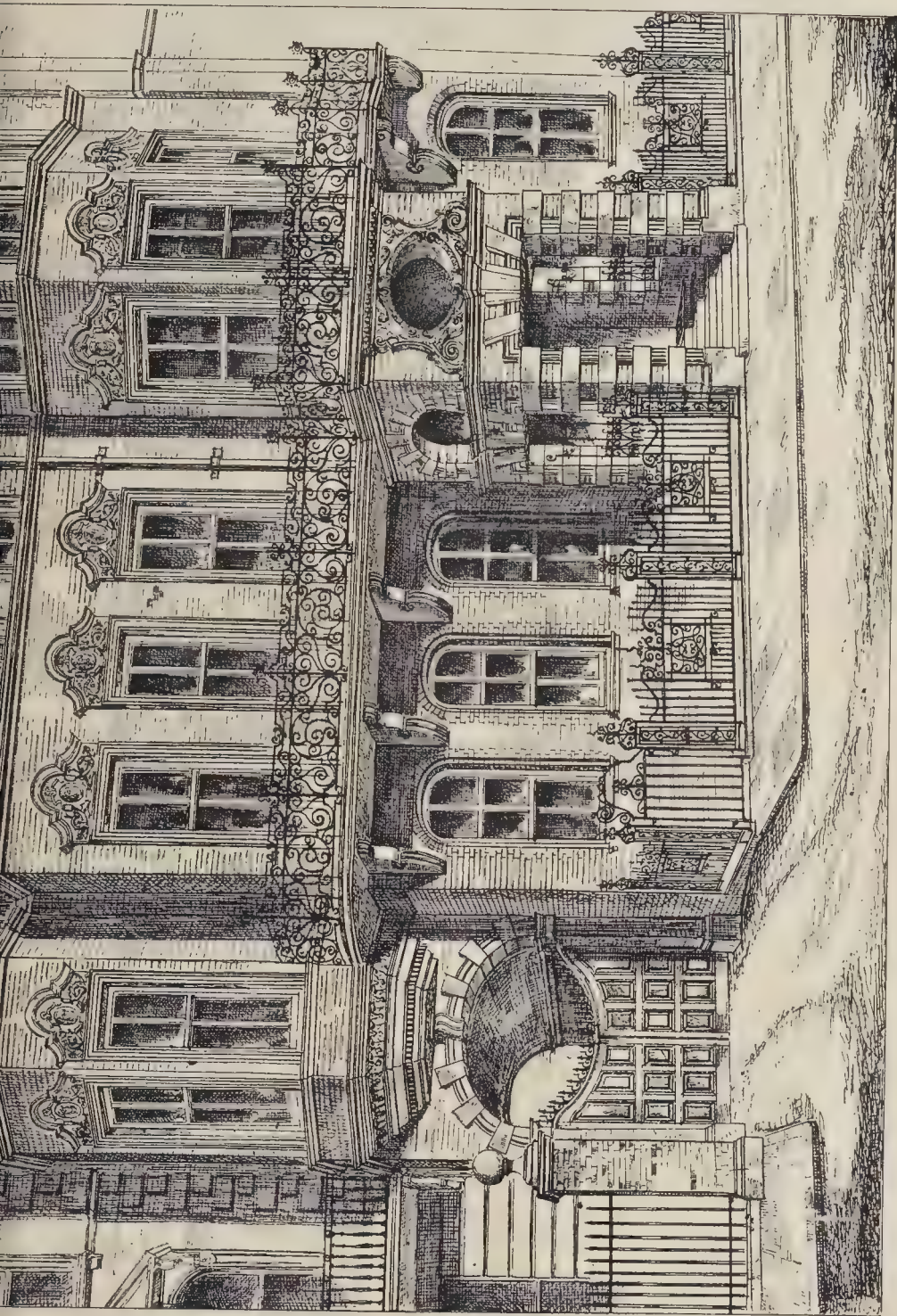




THE BUILDER, JUNE 22, 1889











an air-chamber, with disconnecting siphon trap, or an air-inlet disconnecting siphon trap, which shall be easy of access, on the soil-drain between the building and the public sewer or cesspool. These, it will be seen, are very moderate requirements in a Bill for the "Sanitary Registration of Buildings," as it is called. None of them go beyond what is now the daily practice in such things, when they are done under any qualified instructions at all; such, for instance, as an architect would give, or an engineer acting on behalf of any local Sanitary Authority. What is new in the Bill is that where these conditions are complied with the building shall be registered,—that a sanitary certificate shall be given to its owner or occupier to the effect that its sanitary condition is satisfactory.

The Bill does not interfere specifically with the manner in which the drain itself may be laid, in respect of materials or workmanship, further than to enact that it shall not be lawful for any person or corporation to certify any building to be in satisfactory sanitary condition where the arrangements are not in conformity with the above-named requirements; with the further provision that in the case of a hospital the certificate shall take account of its lighting, warming, and ventilation, and the position of the water-closets, sinks, and discharge-pipes. The certificates are to be given only by those who are qualified in sanitary practice, which is to be known by their possession in turn of a certificate to that effect. Certain professional institutions,—namely, the Royal Institute of British Architects, the Institution of Civil Engineers, the Royal Institute of Architects in Ireland, the Association of Municipal and Sanitary Engineers and Surveyors, and the Surveyors' Institution,—are to give certificates to those of their members whom five examiners, appointed by the governing body, may declare to be qualified to design and carry out constructive sanitary works, and these institutions and associations may charge for each certificate a fee of three guineas. Those who are thus certificated will then be licensed in sanitary practice, free of charge, by the Local Government Board. Also, the Local Government Board will license, free of charge, sanitary associations whose sanitary officers have received their certificates of qualification in sanitary practice in accordance with the proposed Act; also, medical practitioners who are registered as qualified in sanitary science; also, persons who are Medical Officers of Health at the passing of the Act; also, persons who hold, at the passing of the Act, appointments as engineers or surveyors under the Public Health Acts, provided they are members,—including members and associates of every grade,—of one of the institutions above mentioned. Other persons who are, in the opinion of five examiners appointed by the Local Government Board, qualified to design and carry out constructive sanitary works, will be licensed by the Local Government Board on payment of a fee of five guineas.

The means of ensuring a properly-qualified certificate of a building being thus provided for, the owner, lessee, sub-lessee, or occupier of every building used or intended to be used as a school, college, hospital, asylum, workhouse, factory, workshop, hotel, or lodging-house, is to deposit with the sanitary registration authority a sanitary certificate, signed by a licentiate in sanitary practice, and the same applies to every building newly erected after January 1, 1892. In like manner, the owner, lessee, sub-lessee, or occupier of every building may, but without its being compulsory, claim its registration upon presenting a certificate of its satisfactory sanitary condition. The certificate of any building is to hold good for five years. It is then to be re-certified by endorsement of the old or granting of a new certificate. A lessee whose term has less than seven years to run is not affected by these provisions.

The person certifying the sanitary condition of any building is to be deemed to have examined the sanitary arrangements, and is subject to a penalty of 10*l.* on conviction before a justice of the peace of having given a false or fraudulent certificate; and any owner, lessee, sub-lessee, or occupier of a building not certified is to be liable to a penalty of 10*l.* and a running fine of 1*l.* a day during the time an uncertified building shall be let or occupied. It is provided that engineers and surveyors of local authorities shall not undertake to certify the sanitary condition of any building unless on the written request of the owner, lessee, sub-lessee, or occupier, and for such service he is to be paid

by these or one of them a fee approved by the local authority, that is to say, the Corporation, Local Board of Health, or Rural Sanitary Authority, and it is these bodies who are to become the Sanitary Registration Authorities for their respective areas, towns, or districts. Each sanitary registration authority is to appoint a registrar, who may be its Clerk, or some other person, who is to issue notices to the owners and occupiers of houses and other buildings to have their sanitary condition certified, and to deposit the certificate with him previous to January 1, 1891, or, after that date, previous to the buildings being let or occupied. A list of Licentiates in Sanitary Practice is to be exhibited by the Clerk, or at a convenient place for persons desiring to procure sanitary certificates, for which apparently they will have to pay such a fee as may be agreed upon between them and the certifying persons, who perhaps, however, after a while, may agree upon a fixed scale of charges.

The fees payable by Licentiates in Sanitary Practice to the examining bodies are stated, but their own fees are left to individual agreement. This is unavoidable, because of the great variation in the time required for the due examination of different houses, not only as between large and small houses in the same town or locality, but between London houses and those of similar size in some other towns. A gentleman in sanitary practice in London was asked by a committee of an important institution how long the process of examination usually takes. The answer was that the time varies so much with the size of the house, the complication of the sanitary arrangements,—whether there is any plan or not,—and the facility of examination, that it is almost impossible to answer this question; but, to give some rough idea, the examination of an ordinary London house of moderate size might take three or four hours of his personal time, if the house had been previously prepared for his inspection by having the concealed parts exposed. If the sanitary arrangements are complicated, or if there is delay while workmen are opening down to a drain, &c., the time is largely increased. That answer seems as fair an answer as could be given, and is applicable, no doubt, to most cases, wherever situated. But there are many cases where the arrangements of drains and their accessories are of a simple character, and not at all extensive, and in these a full examination might be made in even one hour per house, if preparations for it had been previously made. Very little is required to prepare for an inspection where the drain and its attachments have been laid in the careful manner in which all new drains are, or should be, laid; but some of the old ones certainly do require an amount of labor and time to get at them which no examiner would himself give, although he would probably be required to point out, in the first instance, what is necessary to be done; in most cases, however, the work required is not more than one man can do in a day. Inasmuch as it will, in most cases, be convenient that the person employed to examine the house for certification shall first visit the place and point out what drains or other pipes need to be exposed to view, they who live in the locality will be preferred to those who would have to travel any great distance, even though they be more eminent or better known, the proceeding being, in this respect, unlike that of calling in a physician. Fashion may, perhaps, hold sway, even in such cases as these, and it may occasionally happen that a person may be sent for over the heads of those who reside nearer home; but these cases would surely be few, comparatively, and we should expect the rule to be that the advice of those practising in the locality would be found sufficient for all purposes. The Bill is promoted by some members of the medical profession, notwithstanding that, in one point of view, there is a rivalry between the preventer and the curer of disease. It was brought in by Dr. Farquharson, Dr. Cameron, Sir Henry Roscoe, and Sir Gayer Hunter, and was ordered by the House of Commons to be printed, February 22, 1889.

**Rebuilding of a Swedish Town.**—The greatest activity prevails in rebuilding the town of Sundsvall, in northern Sweden, totally destroyed by fire last year. Formerly the houses were of wood, but in future only brick and stone houses must be erected. Some 300 new dwellings have already been finished, at a cost of about 200,000*l.*

## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

### PRESENTATION OF THE ROYAL GOLD MEDAL.

THE concluding meeting of the present session of this Institute took place at 8, Conduit-street on Monday evening last, Mr. Alfred Waterhouse, B.A. (President), in the chair.

#### Obituary.

Mr. W. H. White (Sec.) announced the decease of Mr. Ralph Nicholson, Associate, and of Mr. John F. La Trobe Bateman, Hon. Associate, and Past President of the Institution of Civil Engineers.

#### The Paris Exhibition.

Mr. Aston Webb (Hon. Sec.), who was warmly cheered on rising for the first time since his election to office, said:—I have to announce, with the greatest pleasure, that the President, Mr. Waterhouse, has been appointed, by the British Section of the Paris Exhibition, as an International Juror in the Section of Architecture (applause). I am quite sure it will be a matter of great satisfaction to all English architects, and to the members of this Institute, that on such an important occasion English architecture will have so distinguished a representative (renewed applause). I have one further announcement to make, and that is that our Secretary, Mr. W. H. White, has also been appointed as our delegate to the Architectural Congress which is about to be held in Paris, and I believe both Mr. Waterhouse and Mr. White are about to proceed to Paris on those two missions (applause).

#### The Secretaryship.

The President: I have a still more important announcement to make, and that is that Mr. W. H. White has been again appointed Secretary to this Institute (applause).

#### The Royal Gold Medal.

The President then rose and said: You will remember that three years ago M. Garnier, the architect of the Paris Opera House, was decorated with the Queen's Gold Medal for the Promotion of Architecture, at the hands of our late lamented President. In the year following, our fellow-countryman, Mr. Ewan Christian, was the worthy recipient of the honour. Last year it was bestowed on Baron Von Hansen, of Vienna, whose age and engagements, unfortunately, did not admit of his coming to this country to receive it personally. All these recipients were practising architects, and two of them are foreigners. This year we have Her Majesty's gracious permission to award this distinction to an illustrious fellow-countryman (applause), who, though not an architect, has done much as an exploring archaeologist to increase our knowledge of some phases of Classical art. He has done this by enriching our already matchless collection at Bloomsbury with selected specimens of his discoveries; by his learned supervision of the Classical antiquities of the Museum; by his writings; and, lastly, by his lectures. Now, though archaeology is not architecture, and though undue and excessive reverence for the works of the past may be even detrimental to the attitude of mind which the practising, originating architect ought to assume, there is no question of how much Art, for the last 2,000 years, has owed to the Greeks, and how much more it might owe with advantage if the essential refinement of this, the highest phase of art, were more studied than it is at present (applause). I therefore think we as architects owe an undoubted debt of gratitude to Sir Charles Newton for his labours as a discoverer of certain monuments of Greek art, as the exponent of their peculiarities and beauties, and as the guardian for so long a period of our great national store-house of Classical art. The main facts of Sir Charles's career are, I apprehend, well known to most here. Born in 1816, he went to Shrewsbury School, and subsequently to Christ Church, Oxford. In 1837 he took he took his B.A. degree with honours. In 1840 he graduated M.A., and in the same year was appointed one of the assistants in the Department of Antiquities in the British Museum. He remained in this post till 1852, when (at the age of thirty-six) he gave up his chance of promotion in order to devote himself to antiquarian research. With this end in view he accepted the office of Vice-Consul at Mitylene, and after some years of general exploration in the islands and on the coasts of the



Ægean, he began a series of extensive excavations, leading to discoveries which may be considered the greatest achievements of his career (applause). The Mausoleum Room at the British Museum, the arrangement of which was, I believe, his last official work at Bloomsbury, contains the cream of his labours. The period of his principal discoveries ranged from 1856 to 1859, and the scenes were chiefly Bodrum (the ancient Halicarnassus), Cnidus, and Branchide. Though the trophies of the Mausoleum collection are mostly sculptural, the remnants of the gigantic Ionic order are of great architectural interest, from their extreme originality. Students of the minutiae of Greek architecture will find in these fragments much that offers striking contrast to the details of Athenian work. Mausolus, the Satrap of Caria, to whose honour this vast sepulchral monument was raised, held his office from 377 to 353 B.C., and as the building was constructed by order of his widow, Artemisia the date of its commencement can be approximately assigned. Before Sir Charles Newton's time this monument was only known to modern scholars by the allusions to it in ancient writers, and if the story be true that Nicholas Hawksmoor realised in his tower of St. George's, Bloomsbury, his interpretation of Pliny's description, it is curious that the remains of the building itself should have travelled to within a few hundred yards of that architect's work, as if to confute his misconception (laughter). Sir Charles Newton's contributions to the British Museum comprise many other valuable relics, besides those I have mentioned. The great lion which surmounted the pyramidal tomb at Cnidus, and which now rests in the Elgin Room, is of his finding, as well as a whole host of inscriptions, vases, coins, and other antiquities, some of which were purchased and others excavated. In May, 1860, Sir Charles was appointed British Consul at Rome, and in the following year, being appointed Keeper of the Greek and Roman Antiquities in the British Museum, he once more transferred his valuable services to the building within which he began his career. In 1874 he was elected Honorary Fellow of Worcester College, Oxford. In 1875 he received the well-merited honour of C.B., since advanced to K.C.B. In 1880 he became Yates Professor of Archaeology at University College, London,—a post which he held at first in conjunction with the Keepership; but subsequently he gave up the latter to devote individual attention to his professorial work. Among his other distinctions are those of being a member of the Accademia dei Lincei at Rome, and of holding a chair in the University of Strasburg. He is, further, a Corresponding Member of the Institut de France, and the Antiquary to the Royal Academy. He has published an account of his travels and discoveries in the Levant, and another work on Halicarnassus, Cnidus, and Branchide, in collaboration with my lamented fellow-pupil, Richard Popplewell Pullan. Some of the beautiful illustrations to these works were from the hands of the late Mrs. Newton, herself a distinguished artist. His University College Lectures are also published. [Turning to the recipient of the Medal, who rose to receive it, Mr. Waterhouse continued:—It is now, Sir Charles, my duty, as President of the Royal Institute of British Architects, to hand you this proof of our appreciation of the value of your services in the cause of architecture and art generally (loud applause). It is given to you, through this Institute, by the Queen, our gracious Patroness, with her Majesty's full knowledge and approval (applause). I may add it is a great gratification to me personally, and I consider it a privilege, to have the honour of presenting the Royal Gold Medal to one so illustrious and so justly esteemed by the architects, archaeologists, and scholars of this and other countries, as yourself (loud and continued applause).]

Sir Charles Newton, whose rising was the signal for renewed applause, said:—Mr. President, ladies and gentlemen,—I need not say, at the end of a long career, how unspeakably gratifying it is to me to feel that what I have done has been duly and generally appreciated (hear, hear). There is such a thing as enthusiasm going blindly on, irrespective of personal consequences (hear, hear); and many such enthusiasts do, I fear, fail; others succeed in carrying out their original purpose. Now my original idea was to do certain things,—to discover certain unknown monuments,—and if I venture to think I have succeeded in my objects, it is enough for me. I started with

blind faith. I believed that there were certain things hidden under the soil of Turkey which it was my destiny to discover. Of course, that was a perfectly irrational conviction, but I believed in it, and I found a liberal and enlightened Government, who followed out my views, and gave me really, I may say without exaggeration, everything I asked for (applause). It was that powerfully-equipped expedition that enabled me to succeed, and then came the recognition of my services by the general public, I may say not only of Englishmen but of other countries (applause). Therefore, I was content,—and more than content,—with the recognition I received at the time. Of course, when I receive this further acknowledgment of my services, it is, as it were, the compound interest of those many years of tentative excavations,—of what were to me very risky enterprises,—and I can only say in return that I have been more than gratified, and more than rewarded, for what I did. Thus much as to myself, but you will permit me, I think, to take this opportunity of urging on you that it is this Institute, more than any other public body in England, which can, if it will, promote the study of ancient Greek architecture (applause). I do not ask you to reproduce, as in the examples at Hyde Park Corner, the beautiful monuments of the Greeks,—to reproduce in our comparatively common stone what they finished so exquisitely in marble (hear, hear). I do not at all ask you to discard the architecture of the Middle Ages, in order to reproduce those original monuments; but I would ask you to study them (hear, hear), and I am quite sure that the more we study them the more we shall learn of the true principles of architecture (applause). The Romans, who had all this before their eyes, failed to seize the exquisite subtlety of Greek architecture, and they have left us, in the work of Vitruvius, a chaotic mass of old traditions, and abstracts of old Greek treatises, which Vitruvius himself seems to have imperfectly comprehended, but which we, after a thorough examination of the monuments still existing, will ultimately be able to decipher and appreciate. Now, in the researches of the Dilettanti Society, and also in the expedition of which I had the direction, we learnt a great deal. We began with the great work of Stuart on "Athens"; but since that time other nations have been at work, and I would particularly draw your attention to the remains of architecture which the Germans discovered at Olympia, and subsequently at Pergamon, because they filled the gap between the great architecture of the time of Pericles and the inferior servile architecture of the Roman period. Those remains tell you what was the architecture of the successors of Alexander,—of those kings who built Antiochus, Seleukeia, and other great cities, and we have now the materials for writing a history of ancient architecture such as has never been before attempted (applause). I would draw your attention to what Rickman did for Gothic architecture. He told us what were the mouldings appropriate to each period; and what we have to do, I conceive, is to see what are really the details of the architecture of what we may call the Hellenistic period. You will find these by the study of the discoveries of the Germans at Olympia and at Pergamon, and you will be assisted very materially in this work by the inscriptions found on those architectural monuments. The inscriptions at Pergamon alone amount to 800 in number. They are not yet published, but the inscriptions at Olympia are published, and I would earnestly recommend to your study, not perhaps for present gain, but for developing enlightened views on the history of architecture generally, those collections, originals or casts of which are now at Berlin. Ladies and gentlemen, I thank you heartily for this recognition of my services (applause). I can only wish I were ten years younger, because I would go again to seek for such treasures, but I am afraid the *anno Domini* tells me it is too late. Therefore I must leave to younger men, and above all to young architects sent out by this Institute, the task of carrying out this national work, which is not an English work only, but an international work, and one in which we may include the efforts made by the American School at Athens (loud applause).

#### *Recent Advances in the Study of Architectural History.*

Professor Baldwin Brown then read a paper on this subject. He began by disclaiming any idea

of bringing forward facts and theories unfamiliar to the audience. The advances made from time to time in the study of the history of architecture were, he said, duly noted by members of the profession, and the works in which they were embodied were to be found in the library of the Institute. Owing, however, to the fact that many of them were in foreign tongues, they did not become readily popularised in this country, and took a long time to reach the younger student. The list of books suggested to students preparing for the examinations of the Institute contained little or nothing from which the learner would become acquainted with the present condition of knowledge on matters of architectural history. It was rather to plead, for more help to the student in these branches of work that the paper had been put together. A distinction must be drawn at the outset between questions in architectural history which had mainly an archaeological interest, and those which formed the basis of large views of the development of the art and its place in older civilisations. As examples of more purely archaeological questions might be mentioned those concerned with the derivation of the forms of the Doric and Ionic temples, an acquaintance with which would not help to any better comprehension of Classical architecture. On the other hand, the still unsolved problem of the lighting of the Greek temple cella had a wider interest, and led us straight to the question of the essential character of the building: Was it an interior hallowed to the service of religion, with something of the solemn gloom and inviolable sanctity of the Temple at Jerusalem? or was it a brightly-illuminated hall, used mainly as a museum of costly and beautiful works of art—a canopy, as Semper had called it, for the votive statue? On the practical use to the architectural student of a knowledge of the past history of the forms he had to use much might be said, but there was no need to insist on any utilitarian plea. The broad fact of the absorbing interest of the study of the development of architecture, an interest not only technical, but social, human, and even religious, was sufficient to give it a paramount claim on our attention. That the recognition of this was a tradition in the architectural profession was proved by the fact that all the great books on architectural history were written by professional architects, who had contributed more to artistic literature than all the representatives of the other arts put together. As examples of questions in architectural history which were of more than archaeological importance might be noted those of the origin of Christian architecture and of the true extent and character of the influence of Byzantine art upon that of the West. It was of interest to know that the first Christian architects had original conceptions, and did not confine their efforts to adapting or copying pagan basilicas. The old traditional theory could not stand for a moment in the mind of any one who took the means now available for discovering what the pagan basilica was actually like, and how markedly it differed from the Christian meeting-place. There was also a traditional view that Byzantine influence dominated early Medieval architecture and decorative art. The Germans had done good service in recent times by vindicating the originality and independence of the Medieval craftsman, and leading to a reconsideration of the views maintained by MM. Viollet-le-Duc and Labarte. A question of greater importance, because of more general and wide-reaching interest, was the question of the architectural relations of the East and the West, with special reference to the origin and character of Roman architecture—the parent of our modern styles. Arched construction had generally been considered characteristically Roman, but what was actually the history of the arch at Rome? The discussion of this question was prefaced by a brief review of the history of the arch in general. After sketching the principal facts connected with the early use of the arch in Egypt, Babylonia, Assyria, Greece, and Etruria, Professor Baldwin Brown went on to argue that neither in these regions nor yet at Rome, till the age of Augustus, could we trace any use of the arch or vault as the dominating feature in monumental architecture. Except, perhaps, in the palaces of Assyrian kings, it was employed universally either in engineering works, for gateways, or for small buildings like the old Egyptian granaries. Yet it stood to reason that a long course of experiments in vault construction must have



gone on somewhere before such a work as the dome of the Pantheon, completed before 27 B.C., could have been brought to completion. Rome, before the time of Augustus, offered no field for such experiments, and we must seek elsewhere for the theatre of them. It was the merit of Gottfried Semper, in his work on "Style," to have been the first to point out that the great Hellenistic cities founded in nearer Asia by Alexander and his successors offered just the facilities required, and were, in all probability, the scene of a new movement in architecture, the influence of which passed on to the Rome of the Emperors. Seleukeia, on the Tigris, was built of the bricks from ancient Babylon; in Alexandria all the houses were vaulted; the recent exploration of Pergamon had proved that Hellenistic builders in the third and second centuries B.C. perfectly understood the use of the arch. What was more probable than that those later Greek architects, working without the traditional Hellenic materials, and in lands where a tradition of arch construction had existed from the remotest ages, worked out, that use of the arch, and vault on a monumental scale for which the Roman builders made themselves everlastingly famous? This question was considered by Professor Baldwin Brown on the technical side by the help of the material brought together in the works of M. Auguste Choisy, in those of Professors Darm, Adler, and others of the modern school, and he concluded by expressing a desire that some competent authorities would undertake the much-needed work of a critical edition of Vitruvius.

Professor Aitchison, A.R.A., in moving a vote of thanks to Professor Baldwin Brown for his interesting paper, said that, like the rest of the members, he had been very much struck by the profoundly interesting lecture they had had from Professor Baldwin Brown, which had come in most opportunistically on the occasion of the presentation of the Royal Gold Medal to Sir Charles Newton, who had devoted an almost romantic life to discovering the remains of temples and monuments whose memory had been handed down to us from remote antiquity, and which they had only lately had the advantage of seeing in the remains he had brought to this country, and in the drawings he had published. In Sir Charles and in Professor Baldwin Brown they had two men most deeply imbued with the importance of Greek architecture, art, and civilisation. It was impossible to over-rate the value of the study of the subject, because the whole civilisation of what was termed modern life was largely owing to the Greeks (hear, hear). Although the other dumb nations of antiquity had done enormous work and aided greatly in the progress of civilisation, the aid given by them had been mostly of a material sort. Without Greek civilisation the world would have been almost without eloquence, sculpture, painting, and refined architecture. In fact, almost everything we enjoyed in the present day was owing to the Greeks. All those who had read the "Comedy of Errors" might not be aware that it was an adaptation of one of the plays of Plautus, which was adapted by Plautus from a now-lost Greek play by Menander (who was a contemporary of Alexander the Great). Therefore we were taken back in almost two steps to the time of Alexander the Great. It was on the foundation of the Greek masterpieces of eloquence that all the subsequent eloquence of the world had been raised, and he believed he was not wrong in saying that although it had been raised on that superstructure, it had never gained in certain points of simplicity, of profundity, or of persuasiveness. A great deal of what Professor Baldwin Brown had said was most interesting from an historical and archaeological point of view, but he did not know as a practising architect that the question as to whence the Romans obtained their first elements of construction was of paramount importance. It was well known that almost everything they had which was not taken from Etruria came directly from the Greeks, and the Temple of Hercules at Cora, near Veii, looked as if it were debased Greek architecture brought directly into the Roman dominions. They knew that Pompey's Theatre was simply the copy of a Greek one at Mitylene, and there was no doubt that the answers to those questions which had so long troubled them as to where the Romans got their orders from, were to be found in the debased Greek architecture carried on from the time of

Alexander. Dinocrates, the architect, who captivated Alexander by the beauty of his shape, and by acting Hercules with the lion's skin, obtained a vast amount of business from that monarch. Amongst other things, he rebuilt the Temple of Diana at Ephesus, which was simply a coarse imitation of the former one; but, no doubt, like a good many other advertising architects, he was not, perhaps, the highest man in his profession (laughter). The most interesting part of the paper was that which dealt with the Pantheon, and the domed and vaulted structures of that epoch. Any architect who had looked into what had taken place in the world must have seen that the amount of invention given to any particular age was relatively small. Any one, therefore, acquainted with the art of building, and the slow progress made in any kind of invention, would feel absolutely at one with Professor Baldwin Brown when he said that the Pantheon was not suddenly evolved. Where the idea was obtained from he knew not, but it had been probably many ages in existence in some part of the world. He thought no one could gainsay this, that if the architect did not copy something he had seen, it was the outcome of long and laborious attempts to make a large dome. Vitruvius was almost as much of an enigma as the dome of the Pantheon, and those who had studied him most were perhaps most in doubt as to what he was. Whether Vitruvius was a military engineer in the ancient sense,—a designer of engines of war,—and had merely spent his spare time in looking at the architecture, and writing a treatise upon it,—he (the speaker) did not know, but he certainly was one of the most mysterious writers whose works had come down to posterity. He knew his art theoretically, but his book was written as a sort of "hand-book" for the nobility and gentry (laughter). Vitruvius described the arch as being made of wedge-shaped stones, and said that care was necessary, when an arch was turned against an outside pier, that the pier should be made thicker, or the pressure would bulge it out; but beyond that, and his mention of the Laconia with domes over them, he said very little more about the arch and the dome, although if the dates given were the right ones, those large vaults of the aqueducts must have been built long before his time. Vitruvius must also have known of the many peculiar and curious methods by which they partially got rid of centering, but he did not give the least hint of them. One of the most peculiar things about the building of those great vaults and domes was that no courses were laid horizontally, which, he believed, was still the fashion of building domes in the East. He did not know that they could say that Alexander was a Greek. He did not speak Greek except in the sense that some Englishmen spoke French; but he, no doubt, had a great number of Greeks in his army, and naturally, as Athens was the great centre of civilisation, he posed himself as a Greek, introducing the civilisation of Greece into the whole of Asia. The term *forum* being used by Ennius for the vault of heaven was extraordinary, and showed that the Romans must have had a vault or a dome before the larger vaulting which they obtained from the Greeks was generally introduced. The *Therma*, or baths, although not so magnificent as those built in Imperial times, and even by Agrippa, must have been known to the Romans. Vitruvius used the name of *Laconium* for the hot-air chamber, and it had probably been obtained from Sparta. Towards the end of the Roman Republic the people were busily employed cutting each other's throats, and the continual dissensions and civil wars were calculated to destroy the wealth as well as the art of the country, and were quite sufficient to account for the barrenness of its architecture in those days (applause).

Professor Kerr said he seconded the vote of thanks with much pleasure. The paper they had heard was, he considered, an exercise in the higher criticism, and ought to be looked at in that light. The time was fast disappearing when architects would criticise buildings by mere forms, and they were beginning to understand more and more, with reference to ancient architecture, that structural necessities underlay all changes of form and style (applause). To look at all such matters in that light was the proper way, and the way in which the greatest benefit would be derived from the contemplation of the curiosities, as well as the more profoundly interesting questions, of history. The problem Professor Baldwin Brown had set them

that evening seemed to be something like this: What was the origin of the very remarkable development of the arch, which had hitherto been considered to be the prerogative of the Romans, and from which the later world had derived so much? Professor Baldwin Brown seemed to have made out quite clearly that in the pre-Hellenic civilisation, there was a system of constructing houses (which had disappeared hundreds of years ago) like those described by Mr. William Simpson as still constructed in the East of mud, stones, or anything which came handy, and with domes not equilibrated scientifically, but built by rule of thumb, and which had culminated, by some process difficult to identify, in the dome of the Pantheon. That was a very important and interesting matter for inquiry, and was the critical question which he understood the lecturer to have submitted to them that evening. The Romans, having taken up the arch, as they unquestionably did, not merely as a great structural, but as a great artistic feature, it was well known what they did with it, and how it had descended to the present time. There was a very interesting question which might have been raised if time had permitted,—the question how the semi-circular arch became suddenly converted into the sharp-pointed arch. That was also a structural question, and all those matters were exceedingly interesting, because they tended to confine attention to that view of criticism which was the proper and philosophical one to take in the present time (applause).

The President, in putting the motion, said that he entirely agreed with Professor Kerr as to the absorbing interest and usefulness of the discussion of such questions as were raised by Professor Baldwin Brown's paper.

The vote of thanks was then carried by acclamation.

Professor Baldwin Brown, in replying, said he was extremely glad to find that two gentlemen of such experience and technical knowledge felt with him upon the main lines of this subject, that they must try and get at the stages through which Imperial Roman architecture came into being,—and see if it came into being at the moment. The paper on mud architecture, read by Mr. Simpson, and referred to by Professor Kerr, was one of extreme interest, as introducing them to the old traditional class of construction used in the East from time immemorial. M. Place's valuable work on Assyria showed in the same way how processes were going on all around him, which threw light upon the actual methods pursued by the constructors of the Assyrian palaces thousands of years before. Professor Aitchison had called attention to the mysterious interest attaching to Vitruvius and his writings. Well, he wished that some one would throw some light upon Vitruvius, and that Professor Aitchison would undertake a critical edition of that writer, which would be the means of bringing together what was known, in the present state of knowledge, of the technical processes in use in the ancient world (applause).

The President intimated that that meeting terminated the present Session, and said that the members would next meet on the first Monday of November.

#### ARCHITECTURAL ASSOCIATION VISITS.

A SOMEWHAT small party of members journeyed on Saturday last into Sussex, in order to visit the Elizabethan mansion of Parham House, a seat of the Lords de la Zouche. Starting from Victoria by an early train, the party alighted at Pulborough, which, although not the nearest point to their destination, afforded a better chance of supplying their material needs. There is, besides, much of interest in Pulborough itself. Situated on the Roman road, Stane-street, running from Regnum (Chichester) to Londinium, and apparently the location of a fortified post, numerous Roman remains have been found in the neighbourhood. The Church, well situated on the hill, and dedicated to Our Lady of the Assumption, contains some good Early English work in the chancel, and Perpendicular nave and aisles, and well repaid the visitors their labours in ascending the steep field-path leading up to it. Amongst its objects of interest, the church contains a triple sedilia of Decorated character, a fine canopied brass of Sir Thomas Harleyng, Canon of Chichester and rector of Pulborough; brasses to Edmund Mille, 1452, and his wife Matilda, which were



removed from the sepulchral chapel of the Mille family formerly standing in the churchyard; and a late Perpendicular altar-tomb of Sussex marble, which the vandalism of a later rector in 1851 appropriated for himself and his wife. There are in the parish remains of two old manor houses, the residences of the Apsley family, called Old Place and New Place, the barn of which latter is said to contain some Early English work.

After luncheon the members proceeded to Parham, their walk taking them partly through the park, in which is the famous herony, formerly located at Penshurst. Parham House was built by Sir Thomas Palmer about 1540 A.D., and in 1597 passed to the Bishopp family, who subsequently became the Lords de la Zouche. Though commonly called an Elizabethan mansion, the house is really an example of that interesting phase of English Renaissance preceding the grotesqueness and elaboration of the Elizabethan period, in which the refinement of the foreign Renaissance and the sobriety of the native Tudor are so happily blended. The garden fronts of Parham are charming in their dignity and regularity of facade, while the entrance-front owes its attraction to the broken-up character of its composition. The universally-pervading grey-tinted stone aids largely, of course, in maintaining the quiet dignity which is the dominant characteristic of the exterior of Parham House. Internally, successive alterations have largely impaired the antique features, though the hall, with its "screens," and the gallery, which is here 160 ft. long by 18 ft. wide and 13 ft. high, with numerous dormer bays, are still evidences of the date of the building. But if architectural features are lacking, there is in Parham that fine collection which suggested the couplet—

"In any house, who can compare 'em,  
Those precious things that lie at Parham?"

Among these "precious things" are an almost unrivalled collection of ancient armour, including British bronze armour, both of the Anglo-Saxon period and of the "bronze age,"—anterior to the Roman occupation,—and a chronological series of Medieval armour, especially helmets, many specimens of which, brought from the Church of St. Irene, Constantinople, were worn by the defenders of the Paleologus against the Turks in 1452. In the library are more "precious things," writings on stone and wood tablets, Egyptian papyri, Greek, Coptic, and Syriac manuscripts from the monasteries of the Levant, printed volumes from the presses of Caxton and Wynkyn de Worde, first editions of Homer, Virgil, and Shakespeare. There are also fine examples of gold and silver plate, enamels, and ivory carvings, and pictures by Ostade, Zuccheri, Gainsthorpe, Vandeyck, Raffaele, and Titian. Leaving Parham, the visitors made their way to Amberley Station, visiting *en route* the Church of St. Michael, Amberley,—principally Norman and Early English, the chancel arch being a fine example of Norman work. The chancel was built about 1230 by Bishop Neville, and has lately been restored. There is also a richly-moulded Decorated south doorway. On the wall of the south aisle is an excellent brass to Johannes Wantele, who died January 29, 1424, with his effigy in shirt of mail and surcoat blazoned vert, three leopards' heads argent, langued gules.

Close to the Church is the Castle, which for centuries was the residence of the bishops of Chichester. The present ruins are probably mainly the work of Bishop Rede, the benefactor of Merton College, Oxford, who, during his bishopric from 1369 to 1386, obtained a *licentia ore nullare* from Edward III. The last episcopal resident was Bishop Sherburne, who died 1536.

#### THE BROMLEY SCHOOL BOARD COMPETITION.

WITH regard to this competition, to which we referred in a "Note" on the 1st inst., p. 407, *ante*, Mr. Charles Bell sends us the following copy of the letter of the Institute on the subject:—

"Royal Institute of British Architects  
(Incorporated in the seventh year of William IV.),  
2, Conduit-street, Hanover-square,  
London, W.  
June 3rd, 1889.

SIR,—Your letter of the 22nd ult., addressed to the President of the Royal Institute of British Architects by direction of the School Board for Bromley (Kent), with a statement of facts and other

documents relating to a recent competition for Board Schools, have been submitted to the Council of the Royal Institute for their opinion and advice, in accordance with the request of your Board. Mr. Charles Bell's design, bearing the motto 'Kent,' for the Valley School in that competition, which you were good enough to forward, was also duly submitted.

The Bromley School Board having added to their statement of facts a series of three questions, to which they ask for answer, the Council of the Royal Institute, after careful consideration of the whole case, as shown in that statement and its accompanying documents, and in the design for the Valley School bearing the motto 'Kent,' have directed us to reply categorically (and in so doing we have inserted the question) as follows:—

**First Question.**—Whether the action of Mr. Bell is in accordance with professional practice?

**Answer.**—The spirit of the instructions to competing architects was that there should be no communication, direct or indirect, between the competitors and the Assessor. Without implying or suggesting any improper motive, it was, in the opinion of the Council, clearly inexpedient and undesirable for any competitor to have obtained the assistance of a clerk of the Assessor, and one, moreover, who is chiefly engaged in the examination of school plans in the Education Department, knowing him to be so employed.

**Second Question.**—Whether, under all the circumstances, Mr. Robson's decision ought, in fairness to the other competitors, to be acted upon?

**Answer.**—In the Assessor's report of March 29, 1889, he writes:—"There is a further stipulation that beyond a certain dotted line no building shall exceed 20 ft. in height. Naturally, any competitor who contravenes . . . these conditions will be excluded. Inasmuch as this design was disregarded by 'Kent,' it appears to the Council that the author of that design should, in terms of the Assessor's report, be disqualified, and his decision in that respect should, in the opinion of the Council, be acted upon.

**Third Question.**—What course the Council would advise the School Board to adopt, whether (a) to select any one of the designs submitted which may be in their judgment most suitable for the purpose, or (b) to start *de novo*?

**Answer.**—If in the opinion of the Assessor no other design submitted for the Valley School sufficiently meets the requirements of the competition, it becomes a question whether it would not be desirable to adopt the Assessor's suggestion thus expressed in his report (before referred to) of March 29, 1889, viz.: "I think it extremely doubtful, in view of this limitation [the stipulation referred to above], and of the fact that the school will have to be enlarged, whether a one-story school is desirable on the site. It appears to me that the boys and girls should be grouped one over the other." In which case a fresh competition, on entirely new conditions and instructions, would be necessary.

The Council have also had before them a letter from a firm of solicitors at Bromley, acting on behalf of some of the competitors in the competition referred to, also formulating questions as to the custom and practice of the architectural profession under certain circumstances. The Council have replied by stating that a communication on the subject of their letter, received from the Bromley School Board, had been under consideration and replied to; and that on making application to your Board they would probably be allowed to inspect the same.—We are, sir, your obedient servants,

J. MACVIGOR ANDERSON, Hon. Secretary.

WILLIAM H. WHITE, Secretary.

To the Clerk of the School Board for Bromley, Kent."

#### GLASGOW ARCHITECTURAL ASSOCIATION.

THE eleventh annual report of this Association, for Session 1888-9, contains the following passages:—

The following were the office-bearers for the past session:—Honorary President, Mr. Thomas Gildard; President, Mr. John Keppie; Vice-President, Mr. Alex. N. Paterson, M.A.; Hon. Secretaries, Mr. Alex. McGibbon, A.R.I.B.A., and Mr. William J. Devlin; Hon. Treasurer, Mr. George Tudhope; Hon. Librarian, Mr. William Fraser; Works Sub-Committee, Mr. Andrew R. Scott and Mr. R. Yates Mayor; Sketch-book Sub-Committee, Mr. Andrew N. Prentice and Mr. Charles Mackintosh; Competitions Sub-Committee, Mr. Wilson Beaton and Mr. Angus MacAuslan. Several alterations were occasioned by change of residence and resignation of membership. Mr. Devlin leaving for Ireland, Mr. William Ritchie was appointed in his stead, and Mr. Fraser leaving for London, Mr. Fred. M. Miller took his place; Mr. MacAuslan obtained an appointment at the Gold

Coast, and Mr. Mayor resigned. These two vacancies in the Committee were not filled up.

The roll at the end of February shows eight honorary members and ninety-three ordinary; of these eighteen are corresponding members. There is thus a total of 101, showing a decrease of eleven upon last report, twelve having resigned, three died, and only four joined.

With regret it is recorded that the first break in the membership by death since the formation of the Association occurred during the past year,—Mr. James Salmon, F.R.I.B.A., I.A., honorary member, was the oldest practitioner in Glasgow. He twice lectured before the Association, on "Foundations" and upon "Architectural Education." The first of these was one of a course on Building Construction, given for some years consecutively, where each lecturer,—all of whom were members of the Glasgow Institute of Architects,—gave the experience of his own particular practice as supplementary to the teaching of the text-books. Mr. James Sellars, I.A., was the first Honorary President, and again in 1885 occupied the like position. Having himself been a member of the Architectural Association which existed previously in Glasgow, his name appearing in its syllabus among the essayists, he had sympathy with the work, and, as an architect in practice, was ever ready to help forward younger students from a personal experience of their difficulties. At different times he lectured before us under the following titles:—"Sanitary Arrangements," "Facts and Fiction," and "Quality, Pattern, and Price." Had he been spared he would have addressed the Association last December. His efforts were largely influential in obtaining distinctive instruction for architectural students at the School of Art; and, more recently, when President of the (Glasgow) Institute of Architects, he took great interest in the preparation of a model course of studies, now practically in operation at the Technical College. These services testify to an interest in the Association's welfare which well merit our gratitude, but more lasting than precept is the practical influence of his life as an architect; and in the long list of his works which remain with us,—not confined to one style, though in one he excelled,—lies the most eloquent incentive to diligent emulation. Mr. Matthew Gemmel, ordinary member, who died just at the completion of his apprenticeship, was connected with the Association for some years, and in the last report was honourably distinguished as the winner of the Hon. President's Prize.

There have been nine ordinary monthly meetings, at which there has been an attendance ranging from fifteen to thirty-seven. At the opening social meeting, held in the Bath Hotel, twenty-eight members and guests attended, among these latter being Mr. Hippolyte J. Blanc (President of the Edinburgh Architectural Association), Mr. T. L. Watson, F.R.I.B.A.; Mr. James Sellars, I.A.; Mr. Francis Newberry (Head Master, School of Art), and others. These representatives named expressed the utmost goodwill towards the Association. In the syllabus of essays there was included a series of three upon one subject, thus following a precedent set the previous season with marked success. The papers were, as customary, exclusively the production of members, and were generally accompanied by drawings, specially prepared by the authors, many of considerable elaboration. The discussions which followed their delivery, opened by a member arranged upon, have perhaps been less interesting, because less taken advantage of than might be. To permit the various subjects treated of to pass without an interchange of opinion is to let slip a valuable means of mutual improvement. In order the essays were as follows:—"A Sketching Tour in Fifehire," by Mr. John Dall; "Norman Architecture," by Mr. Alex. N. Paterson, M.A.; "Transitional Architecture," by Mr. William Kerr; "Early English Architecture," by Mr. Andrew N. Prentice; "A Tour in Italy," by Mr. William James Anderson, first "Alexander Thomson Travelling Student"; "Wrought-Iron Work," by Mr. Wilson Beaton; "Church Organs," by Mr. Laumont D. Penman; "Perspective," by Andrew R. Scott; "Jedburgh Abbey," by Mr. William Fraser; "Greek Ornament," by William M.W. Petrie; and "The Antiquities of Lanarkshire," Mr. George Tudhope.

The course of lectures has this session been reduced to four, blanks being caused by the death of Mr. Sellars, and the death of Mr. Blanc's partner, Mr. John Gordon, pre-



vented his giving the lecture on "Scottish Collegiate Churches of the Fifteenth and Sixteenth Centuries." The four delivered were—"Recollections and Reflections," by Mr. Thomas Gildard, Hon. President; "The Art of Decoration," by Professor Baldwin Brown, M.A., Edinburgh; "Drainage," by Mr. John Honeyman, F.R.S.E., honorary member; and "Joinery," by Mr. R. C. Grant. These have been delivered in the rooms of the Philosophical Society, Bath-street.

Visits have been paid to several places and buildings,—to the Old Chapel at Largs and the College buildings at Cambrae (Mr. Butterfield, architect), Newark Castle, Port-Glasgow, New Barony Church (Messrs. John Burnet, Son, & Campbell, architects), and the Forth Bridge on the autumn holiday. There has been no Association summer tour, and two of the visits set down in the syllabus were abandoned, those to Carlisle and to Bothwell Castle,—the latter owing to antiquarian operations then proceeding.

This record of the past session does not tell of unqualified success, but there is reason for congratulation that of late years it is not altogether apathy on the part of the general body of architectural assistants which prevents their attending our meetings and visits, and joining in our work, but rather the counter attractions of the various educational agencies now at work in our midst. With these we would in no wise wish to contend,—our aims are alike; but we can assure any not yet connected with us that there are benefits at the disposal of the Association which may fitly supplement the tuition of the several evening classes.

#### SURREY ARCHÆOLOGICAL SOCIETY:

##### MEETING AT WANDSWORTH.

The members and friends of this society recently paid a visit to the old Manor House, Wandsworth, a few remarks upon which appeared in the *Builder* of the 11th ult., p. 350. Viscount Middleton, the President, occupied the chair, and said that Mr. S. W. Kershaw, who had been announced to read a paper on the history of the house, was unfortunately unable to be present; the paper would therefore be read by Mr. Mill Stephenson, Hon. Secretary. In his paper Mr. Kershaw said that Queen Anne resided at the Manor House eighteen years before she was elevated to the throne in 1702. The house was previously owned by Mr. Peter Pagin, who was buried in the adjoining cemetery of the Huguenots. As to the construction of the house, and the rumour that it was designed and erected by Sir Christopher Wren, Mr. Kershaw said he could find no documentary evidence in support of this suggestion. The house was built in the seventeenth century, no doubt after a design by Sir C. Wren. After residing here eighteen years, Queen Anne removed to Hampton Court, where, as is well known, Sir C. Wren was employed, and "she continued him" (as stated in "Wren and his Times" by Elmes) "in all his appointments." The elaborate carvings were attributed to Gibbons, and the paintings to Sir James Thornhill. In Queen Anne's boudoir was a painting of the Queen receiving a sealed letter. The house and grounds now occupy about six acres. Mr. Kershaw's paper concluded by expressing the hope that means would be found for preserving the house from demolition.

The members and visitors, consisting of a large party of ladies and gentlemen, then proceeded to the parish church, where Mr. George Patrik described the building and monuments. The Vicar, the Rev. W. Reed, received the visitors and welcomed them, after which Mr. Patrik read a short history of Wandsworth, commencing with the "Stone Age," stating that implements of stone were frequently found, for the most part in the bed of the Thames. He mentioned Caesar's camp, hard by, and spoke of a footpath that formerly led to it from this town. He attributed the name "Wandsworth" to Roman origin; the name was first mentioned in 693. He could find no ancient records of the foundation of the church. The first mention of the building was in 1249. In the twentieth year of Edward I. the living was valued at ten marks, and at the Dissolution of the monasteries the rectory was vested in the Crown. The present church was commenced in 1725, and in 1779 was extended. Respecting the monuments, the one to the left of the altar was to the memory of Henry

Smith, the well-known Surrey benefactor, who was a native of Wandsworth; the monument on the right was to Susannah Powell, whose husband was Yeoman of the Guard to Queen Elizabeth, James I., and other sovereigns. Having noticed the other monuments and brasses, Mr. Patrik concluded by referring to the settlement of the Huguenots at Wandsworth.

Mr. Ralph Nevill, F.S.A., next made a few observations on the church, and Mr. J. G. Waller on the brasses therein.

Mr. J. T. Squire then described the parish registers, which, he said, consisted of twenty volumes, commencing with the year 1603, and they were perfect, with the exception of only one volume which was missing, and which was coincident with the period when it was enacted that burials should be made in woollen shrouds. These registers were afterwards inspected by the visitors, who then adjourned to the Free Library to inspect Mr. Lawrence's collection of flint implements and other antiquities, and here Mr. Davis, the librarian, also read an interesting paper thereon. The meeting then separated, many members afterwards visiting the old Huguenot Cemetery before alluded to.

Mr. Mill Stephenson, Hon. Sec., at the conclusion of the meeting, announced that the annual excursion of the Society would, this year, be to Limsfield and Titsey (the seat of Mr. Granville Leveson-Gower, who was present), about the middle of July. We may add that this district has not been visited by the Society since 1865. An account of the last visit will be found in the *Builder* of September 2, of the year named.

#### Heavy Newspapers for Australasia.—The Post Office has issued the following notice:—

"From the large number of newspapers for the Australasian colonies which are posted insufficiently paid, there is reason to suppose that the rate of postage chargeable on newspapers for those colonies is not generally known by the public in this country. Complaints, moreover, have been made by residents in the colonies to the Colonial post offices as to the charges collected on delivery of insufficiently paid newspapers from the United Kingdom. It seems desirable, therefore, to call attention to the fact that the payment of a penny does not in all cases cover the postage of a newspaper to Australasia, but is only sufficient if the newspaper does not exceed 4 oz. in weight, an additional penny being chargeable for every additional 4 oz. or fraction of 4 oz. The following is a list of newspapers exceeding 4 oz. in weight which have of late frequently come under notice, as insufficiently prepaid:—*The Times*, the *Graphic*, the *Illustrated London News*, the *Pictorial World*, the *Illustrated Sporting and Dramatic News*, the *Field*, the *World*, the *Standard* (when more than eight pages), the *Morning Post* (ditto), the *Daily Telegraph* (ditto), the *Daily News* (ditto), the *Guardian*, the *Builder*, the *Scottman*, the *Mining Journal*, the *Lancet* (thick copy), the *County Gentleman*, the *Herk Herald* (with weekly supplement), the *Spectator* (with supplement), the *Glasgow Herald* (ditto), the *Glasgow Weekly Herald*, the *Somerset County Gazette*, the *Gracer* (with supplement), the *Hercford Times*, the *Lady*, the *Lady's Pictorial*, *Truth*, *Land and Water*, and *Wheeling* (with supplement). When newspapers are posted insufficiently prepaid, double the deficiency is collected on delivery. In order to prevent annoyance to their correspondents in the Australasian Colonies, the public are strongly advised to prepay the postage in full."

We may call the attention of our readers to the fact that we issue every week an edition printed on thin paper for foreign and colonial circulation. Each copy of this edition weighs between 7 oz. and 8 oz., and the charge for its postage to Australasia is twopenny.

**The Norwegian Stone Industry.**—A company, the first of its kind,—has been formed at Christiania, styled the "Stone-Export-association Varild," the object of which is to export raw and unpolished Norwegian granite, Labrador, syenite, marble, &c., for building and other purposes. The company will particularly give attention to the English and German markets. Respecting this industry, it may be of interest to add that Dr. Hans Reusch, the well-known Norwegian geologist of the Christiania Mineralogical Museum, has just prepared sample collections for the use of those desirous of utilising the various stones found in Norway for architectural, sculptural, or other purposes, with description of what each is most adapted for. Syenite in particular,—a beautiful green stone,—is becoming in great demand for ornamental purposes in Scandinavia and Germany.

#### "THE TRIANGULATION THEORY."

SIR,—It seems strange that at this time of day any one should call in question the existence of mathematical proportion in Mediæval buildings. The consensus of opinion in favour of the theory among writers who have gone into the subject, and the examples they have brought forward, are so striking to be ignored. Cockerell, Viollet-le-Duc, Street, and Waterhouse, in their published lectures, are names that occur to one on the spur of the moment among those who have given their adhesion to the principle. Mr. Street's little monograph of Stone Church, in Kent, may be consulted on the point. But surely the "unerring Mediæval instinct" of design is as apparent in mass as in detail. Set an ancient steeple and a modern one side by side, and any one can tell five miles off which is which. Is there no reason about this?

I do not, however, intrude upon your space merely to theorise, but chiefly to quote an instance (nearer home than Beavais) from my own experience. This is the interesting church of Dronfield, in Derbyshire,—an example taken at haphazard, as being a church I happen to have measured-up pretty completely. A system of proportion, partly geometrical and partly arithmetical, seems to have obtained here. I take it that the various ratios, one providing well-defined ratios are established. One can easily conceive of two distinct systems co-existing, and overlapping, especially when the connexion between them is necessarily close. In Germany, for instance, I am told, on good authority, that the arithmetical system was chiefly in vogue, based on the Nos. 3, 5, 7.

At Dronfield the chancel is a remarkable Decorated work, and the rest of the church of various dates. This chancel is 23 ft. 4½ in. wide and 59 ft. (i.e., 2½ squares) long. The great east window is formed on a double square: 18 ft. from string to springing, 18 ft. from spring to apex, and 18 ft. wide. The side windows are 6 ft. 9 in. wide, 18 ft. to springing, and 20 ft. 3 in. (or 3 squares) to apex. The roof has been so completely altered that it is impossible to tell its original height. The nave is the same length as the chancel, or 59 ft. 6 in. Being 14 ft. 8 in. wide it is (roughly) 4 squares long. Its height to wall-plate is given by two equilateral triangles, whose base is the width of the nave, centre to centre, and an equilateral triangle erected on the width of the bays, centre to centre, gives the springing-line of the arches. I was unable to measure the spire, but the total dimension from the ground, given me by some local builders from previous measurement, was just double the ascertained height of the tower, and practically the same as the total length of the church *minus* the steeple. Furthermore, the principal string of the tower divides it into two just half-way up. I have not worked out the whole church to scale, or no doubt further ratios would be established. I may mention that I am told by those who speak from measurement that the neighbouring church of Chesterfield is planned most exactly on a system of squares. Now, when one discovers such repeated "coincidences" as those above-quoted, one draws in their regard a conclusion similar to that which in "the argument from design" is deduced respecting the harmonies of visible creation; i.e., an intelligent cause, and if such principles were known at Dronfield, depend upon it they were known at St. Denis, and for the matter of that, probably at Dronheim too. I am not prepared to go into the question of Wilars de Honcourt and his sketch-book, but what does Mr. Pite make of Cesarano (*vide* Cockerell's) paper on the buildings of Wykeham?

But to recur for a moment to the abstract question. Music has been defined to be "an emotional structure on a mathematical basis." I am convinced that the same may be said of the Fine Arts generally, and that, in fact, law (often no doubt undiscovers) is really the condition of beauty. At all events, if the most spiritual of the arts can suffer such constraints, need architecture consider herself outraged by the discipline? The extraordinary thing seems to me to be not that she should be subject to an abstract law conformable with the general law, but that the contrary should be supposed possible in a universe where all things are ordained "in number, weight, and measure."

2, Halsey-street, S.W.

W. RANDOLPH.

#### TRAPPING SINK WASTE-PIPES.

SIR,—I was much pleased at reading your remarks in the "Note" on pp. 443-44 condemning the practice of fitting-up sinks without any trap upon the waste-pipe when the said waste-pipe discharges openly outside. No good and sufficient reason can be given for the absence of the trap, for without it the waste-pipe simply becomes a stinking inlet air-pipe to the house. The plan is dangerous to health, and no doubt sometimes causes disease.

I was speaking to one of our leading Glasgow master-plumbers about this a few days ago. He stated that at present he was being forced to fit up some sinks in this insanitary style. A formal



expression of opinion from the British Medical Association, or other high authority, condemning the practice, would help to stop it.

W. P. BUCHAN.

Glasgow, June 15.

## The Student's Column.

### TOWN DRAINAGE.

XXV.—FLUSHING HOUSE-DRAINS.

**T**HE quantity of water supplied to a town may be 25 gallons per day per head of the population. It is more than that in some towns, and less in others; but not much more than half of it is used in houses. There were at the last census in England and Wales 4,831,519 inhabited houses, and a resident population of 25,974,439 persons, or, say, 5·37 per house. Taking the average quantity of water supplied to a town at 25 gallons per head, that would be 134 gallons per house per day; but this includes all other requirements,—those, namely, for steam boilers, manufactures, breweries, slaughter-houses, warehouses, hospitals, workhouses, and public buildings generally; and watering streets, flushing sewers, fires, fountains, &c.—that is to say, trade purposes and public sanitary uses,—and when the water used in these is deducted there remains out of the 134 gallons not more than about 80 or perhaps 90 gallons per house per day, the difference between this quantity and that used for trade and other purposes being wasted. But the quantity used in a house varies with the number of such conveniences as have been named in recent articles, and while the average quantity used in houses and converted into sewage may be 80 or 90 gallons per house per day, in small houses,—by far the greater number in any town,—it is not more than 50 gallons. Moreover, in all cases the water used is discharged into the drains in small quantities spread over about fourteen hours of the day, and, where there is no bath, not more than 3 gallons, perhaps, is discharged in any minute of that time. Where there is a bath in a house, used daily, the case is different: here, if the waste-pipe be sufficiently large,—say 1½ or 2 in. diameter, according to circumstances, as has been mentioned under the head of waste-pipes,—a discharge of 20 gallons of sewage per minute, for three minutes together, may take place in the house-drains, but more commonly at the rate of 10 gallons per minute for five or six minutes together.

In either case, therefore, the quantity is but small, considered as a stream of water, or rather sewage; and when there is no bath, or one but seldom used, a flush-tank is very useful for keeping the drain free from deposit, and free, therefore, from foul air in close proximity to the house. All efforts tend to this, while making such provisions as are necessary, as a matter of convenience, to carry off the heaviest rainfall from the back premises of houses. The occasion of this may not occur for a number of years, but it must be provided for in the carrying capacity of the drain, and while this requirement tends towards the enlargement of the drain, the other one,—which is the more important of the two, as being a matter of health,—tends in the opposite direction. On the whole, it may be said that a flush-tank is not only a useful, but a necessary appliance for the greater number of house-drains.

There are three kinds of flush-tank, two of which act without personal attention; the other is discharged by opening a valve as occasion may require. Of the two automatically-acting "tanks," or, rather, flushing-boxes, one is discharged by means of a siphon-pipe, the other tips up when full, reseating itself. It is hung on an axle, the ends of which are supported from below, the box turning between its supports, and, when full, discharging the water into the drain. When seated at rest, empty, in a horizontal position, its hinder end is heavier than the other, but before it becomes full the front end preponderates, and it is emptied at once. When made of sheet iron, galvanised with zinc, and hung with such bearings as wear but little with long use, it acts very well, except in one respect,—that there is a slight noise made by its coming back into its seat; but by counterweighting one end of the box, it may be hung so as to swing freely between its supports without coming to any seat at all, and thus working silently. The slight noise, however, is probably of no importance in most situations in

which a tilting-box is fixed. If it is so, it can be avoided by adopting the earthenware box made by Messrs. Dackett & Son, of Burnley, which works silently when fitted with india-rubber stops. The sheet-iron box is, indeed, also fitted with these when required, and what slight noise is produced proceeds from the nature of the material rather than from the manner in which the box is seated. The earthenware box, however, can only be made of small dimensions, to hold, say, 3 or 4 gallons, while the iron box holds 20 gallons, or more if required.

The other kind of automatic flush-tank is discharged by a siphon-pipe, of which the form invented by Mr. Rogers Field, C.E., is that best known, called the annular siphon. The ordinary siphon consists of a bent tube, the outer leg of which is longer than the inner one. If the air in the outer leg be reduced in density by any means, the mouth of the inner leg being at the same time subject to the pressure of the atmosphere, the velocity of the water down the outer leg will be greater, the greater be the difference between the lengths of the outer and inner leg; but some difference is absolutely necessary to produce the action at all. For flush-tanks for house-drains a difference of a few inches only is sufficient, and a foot is sufficient for a large tank. With the ordinary bent tube Mr. Field's experiments showed that when the water adheres to the side of the pipe in its descent,—which it does when there is but a small stream,—it has but little hold on the air through which it passes, and carries but little with it, requiring that it run a long time before the siphonic action is produced. Mr. Field, therefore, formed the mouth of the pipe so that the water falls clear of the sides, being directed to the centre by an internal lip all round, and so falling in one stream surrounded by air, a portion of which it carries with it and expels from the lower end of the pipe through the water into which it dips, the air rising in bubbles through the water. The siphonic action goes on until the water in the tank falls to the mouth of the pipe, whereupon air is admitted and the action stops. If the sectional areas of the pipe and the tank bear such a proportion to each other, and to the rate of flow of the stream of water coming into the tank, as to allow sufficient time for the complete refilling of the pipe with air through its mouth near the bottom of the tank, then the water continues to rise in the tank until it reaches the top of the siphon-pipe, or inner tube, which, in this form, takes the place of the outer leg of an ordinary siphon; but the fixed parts necessarily retain the same relative capacities, while the volume of water coming into the tank may vary from time to time, so that the proportions are then altered, and the mouth of the pipe in the tank is sometimes fully aërated, whereupon the action of the siphon begins before the water has risen to its proper height, discharging only a part of the quantity which is intended by the dimensions of the tank to be discharged at once. This irregularity may be prevented by emptying the small basin into which the siphon-pipe dips, and so letting in air at that end, after which the siphonic action will not commence again until the water in the tank has risen to its proper height. To empty the small basin under the discharge-pipe a secondary siphon of small dimensions may be placed over its edge, discharging into the drain; but with a regular stream of water, and true proportions of the fixed parts, this is unnecessary.

There is another way in which the action of the siphon is begun and made certain of continuation until the tank is emptied. It resembles the method of charging a siphon mentioned before as the plenum process, in contradistinction to the vacuum process, in the discharge of the contents of service-boxes in houses. There is a tumbling-box in the tank, acting in the same way as that first above named,—it tips up when full. In the "Automatic Flusher" of Messrs. J. Stone & Co., of Deptford, the supply of water enters the tank in the ordinary way until it is nearly full, and is then directed into the tumbling-box, the emptying of which fills the throat of the bent siphon-pipe, and brings it into action at the time when it is desired that the tank shall be emptied,—that is, when full, and not before.

Pneumatic action is so useful in discharging the contents of cisterns and tanks that almost every maker of such things adopts it in one form or another. Messrs. Doulton & Co. make

an excellent flush-tank in earthen ware for house-drains; also Messrs. Adams & Co., of York. The form made by Stone & Co. is the patent of Messrs. Denton & Butler. The agents of Field's flush-tanks are Messrs. Bowes Scott & Read, of Westminster.

With regard to the first-named of these contrivances for flushing drains, holding three or four gallons, its place is at the head of the branch drain of a water-closet in the yard or outdoor enclosure of a house, the slop-water of the house or washhouse being discharged into it, instead of into a gully. We have hitherto supposed a house to be supplied with water by a pipe from the street main, in which case a water-closet is supplied from a service-box overhead; but where there is no regular water-supply the ordinary slop-water of the house should be used as far as possible to meet the deficiency. Mr. A. M. Fowler, C.E., of Manchester, first devised the means of doing this, we believe. But it may be observed that a water-closet system ought in all cases to be accompanied by a regular water-supply. The whole system of house drainage, as well as of sewerage and sewage disposal, depends for its success on this being done. The place of the automatic flush-tank, holding twenty or thirty gallons, for a house drain of 6 in. diameter, is at the head of the main portion of the drain, irrespective of its branches, each of which is flushed by its special means, whether that be by a tipping-box at the ground level, or a service-box overhead; for, it may be observed, it is possible that each branch may be well flushed while the main portion of the drain remains but little better than a cesspool, though somewhat better, because it is flushed out when the rainfall is heavy enough.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

7,712, Lavatory-basins, &c. A. Harris.

To prevent misuse, according to this invention, the whole or a portion of the apparatus for emptying and filling is out of control of the person using the basin. Instead of being swung or emptied by hand, a footboard is employed, upon which the person using the basin or washstand stands. This footboard is attached by levers and connexions to the waste-valve or cock in such a manner that when a person stands upon the footboard the aperture of the waste-pipe is closed by the weight of the person standing, and when the weight is removed the waste-aperture is opened. For some cases an arrangement of parts and attachments are fitted so that the basin can only be filled on the insertion of a coin, or its equivalent into a suitable coin-fed apparatus connected to the actuating parts or the waste-supply.

11,796, Improvements in Bell-pulls. D. O'Halloran.

To prevent bell-pulls being wrenched off, and for more effectively actuating them, and rendering them less liable to injury, the pull is, according to this invention, screwed or fitted direct to a bell-crank, and is controlled by a spiral spring fitted at one end of the rod of the bell-pull. The knob of the pull being always drawn tight into its cup or socket, it prevents its being easily wrenched off; and the violent ringing of bells by tradespeople and others, which distresses nervous or delicate persons, is prevented, as the pull of the bell is capable of adjustment, and the bell is really controlled by the action of the spiral spring.

15,857, Metallic Ceilings. W. R. Kumeur.

This invention has for its object to provide a panelled ceiling in which the beading between the panels may be ornamented in relief, and in such a manner as to conceal or render harmonious the fastenings by which the ceiling is suspended; to provide ornamental "drops" at the intersections of the beading; and to provide panels for composing the ceiling, so constructed as to limit the liability to breakage in the corners incident to the panels of the ordinary construction.

16,729, Attaching Finger-plates to Doors. F. J. Stokes.

Instead of manufacturing finger-plates in one piece, with the holes for the screws or nails therein, the plates are by this invention made in two or more parts of suitable materials; thus, the centre-piece may be of china, glass, wood, or other suitable substance, and the two end parts of stamped metal with suitable screw or nail holes therein, and formed so that when fixed in position on a door they firmly hold in place the centre part.

12,896, False Backs to Fireplaces. J. M. Gerhold.

According to this invention, the fireback is constructed so as to be entirely loose, and with its attendant foot-plates or fittings capable of being



moved with little trouble and by any unskilled person from one fireplace to another. It may also be moved backward or forward so as to increase or diminish the space in which the combustion of the fuel is effected. A binged top or flap is also fitted to regulate the amount or intensity of the heat projected into the apartment.

#### 1613, Window Ventilation. H. C. Stevenson.

According to this invention, between two movable wire screens, which work on rollers, is fitted a rectangular wooden frame which thus forms a chamber to contain disinfectants, which are contained in wide-mouthed jars supported on the frame. By this means the air passing in through the screen becomes charged with the disinfectant or inhalant, and the fumes of sulphurous acid for the destruction of germs may in this way be used without danger to the patient in a sick-room or to moisten the air.

#### NEW APPLICATIONS FOR PATENTS.

June 3.—9,136, G. Oliver, Ventilating Sowers and Drains.—9,137, G. Wilkes and J. Bishop, Attaching Door-handles to Spindles.—9,151, A. Sweet, Looks and Attaching Knobs to Spindles.—9,155, R. Wilford, Self-acting Fastenings for Windows, Doors, &c.—9,159, W. Harrison, Closing Swinging-doors.—June 4.—9,255, J. Anderson and W. Wilson, Whitewashing-brush.—9,256, J. Shaw, Ventilating Sewers, Drains, &c.—9,257, H. & H. Holloway, Tie-hinges to Walls, &c.—9,262, J. Whitehouse and R. Blood, Lever-sash Fasteners.—9,270, C. Rogers, Wood Screws.—9,290, A. Elmdorf and Others, Water-closets.—9,305, E. Johns, Water-closet Basins and Traps.—June 5.—9,335, J. Ingelton, Fitting Windowsashes and Sash-frames.—9,379, P. De La Sala, Construction and Decoration of Buildings, &c.—June 6.—9,404, H. Vick, Chimney-pots.—June 7.—9,434, H. Heymann, Wood Screws.—9,436, J. Fleming, Paint.—9,450, L. Wilson, Dies for Bricks.—9,451, V. Carroll, Ventilation.—June 8.—9,516, R. Lutzmann, Mechanism for Folding-doors, &c.—9,533, A. Johnston and C. Hayward, Ventilation.—9,543, J. Roberts, Door Frames and Sashes.—9,551, J. Gersant, Brick-pressing Machinery.—9,552, J. Mitchell, Corrugated Structures.—9,557, W. Jones, Warming and Heating Buildings, &c.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

6,504, B. Phillipson, Water-closet Sents.—6,557, W. Bruce, Fire-grates and Ventilators combined.—6,960, J. Tall, Hinges with Stays, &c., for Ledger Doors.—7,001, B. Mitchell, join, Retaining or Securing Doors in any desired position when open.—7,253, W. Hillard, Dowel or Dowel-pin.—7,306, G. Williams, Flush Bolts for Doors, &c.—7,307, G. Williams, Barrel Bolts for Doors, &c.—7,381, N. Denny's Preserving and Anti-Fouling Paint.—8,071, F. Moore, Exhaust Ventilators.—8,183, J. Burford, Fireplaces for Kitchens, &c.—8,201, W. Allenby, Retaining Window-sashes at any desired height.—8,331, C. Butt, Screws and Nails.—8,466, D. Brown, Ventilators.—8,572, C. Taylor, Plaque Irons.

#### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

8,309, J. Mulligan and Another, Chimney or Ventilating Caps.—8,561, The Gas Patents Syndicate, Kilns for Firing Bricks, &c.—9,454, F. Boshardt, Bath Rooms.—10,550, J. Pollard, Lookfast Gear for Axial Engines.—11,398, F. Brevint, Compound for Removing Paint from Painted Surfaces.—11,483, H. Planner, Disinfecting Apparatus for Water-closets.—11,603, C. Darrah, Ventilators.—6,348, J. Wolf, Plastic Fire and Weather Proof Wood Mass.

#### RECENT SALES OF PROPERTY:

##### ESTATE EXCHANGE REPORT.

JUNE 6.—By WAINWRIGHT & HEARD (at Sherborne). Sherborne, near—Loader's Hill Farm and 52a, 1r. 25p, f. 2,350 p.s. 2,350  
Wootton Granville Farm and 63a, 2r. 3p, f. 3,333  
Court Farm and 40a, 3r. 15p, f. 2,030  
Church Farm and 23a, 2r. 25p, f. 7,000  
Over Newland Farm and 300a, 3r. 31p, f. 5,500  
F. pasture and woodlands, 41a, 1r. 25p, f. 1,180  
F. cottage and garden 100  
JUNE 11.—By INMAN, SHARP, HARRINGTON, & ROBERTS. Brixton-hill—The residence, "Florence Lodge," and 3a, f. 3,550

Sevensands, Granville-rd.—"Oak House," r. 275 p.s., ut. 98 yrs, g.r. 215 630  
Woodridings and Hulsids, ut. 98 yrs, g.r. 230, r. 2,150 p.s. 1,200  
The residence, "Westwood," ut. 98 yrs, g.r. 215, e.r. 275 p.s. 800  
Dagenham—16, 16, and 17, Station-rd., ut. 92 yrs, g.r. 240, r. 2,300 p.s. 170  
Nov. 28 to 34, Station-rd., ut. 32 yrs, g.r. 227, r. 2,117 p.s. 400

JUNE 12.—By ARBES, RUTTER, & WAGROAN. Regent-st.—8, 9, and 10, Denman-st., f. area, 3,500 ft. 6,330  
By R. TRENK & SON. Kingsland—36 to 46 (even), and 49, 52, and 54, Englefield-rd., ut. 34 yrs, g.r. 254, 10a, r. 2,340 p.s. 1,890

By T. TURNER. North Kensington—45 and 47, Trevorton-st., ut. 74 yrs, g.r. 215, r. 236 p.s. 2,300

By CHRISTOPHER & SONS. Kensington—10, Campden Hill-rd., ut. 65 yrs, g.r. 217, 10a, 1,700

By D. YOUNG. Stockwell—23, 24, and 25, Colmore-rd., ut. 85 yrs, g.r. 218, r. 217 p.s. 900

By T. B. WASTACOTT. Kentish-town—L.g.r. of 29, ut. 75 yrs, 193  
28, Brook-rd., f. r. 228 p.s. 800  
236 p.s. 305  
51, Wellington-rd., ut. 64 yrs, g.r. 27, 7a, r. 845  
245 p.s. 845

By HAYNES, FAYRE, & LINDEN (at Knockholt). Knockholt—1 & 2, Beech Cottages, f. r. 223, 5a p.s. 280

JUNE 13.—By R. A. NOTLEY. Harrow-rd.—F.g.r. of 233, with reversion in 80 yrs, to c.r. of 233 p.s. 740  
West Hampstead—18, Woodchurch-rd., f. r. 2138, 12a, 6d p.s. 2,410

By FURBER, PRICE, & FURBER. Bayswater—2, Palace House, ut. 26 yrs, g.r. 224 Hackney—23, Dalston-lane, ut. 60 yrs, g.r. 21, 10a, 290

Wimbledon—12, Pelham-rd., f. 290  
Norbiton—7, Richmond Villas, ut. 60 yrs, g.r. 26, 10a, 90

By GRACE & BONS. Upper Clapton—47, Clapton Common, f. e.r. 255 p.s. 600  
St. Luke's—33 and 34, Great Arthur-st., f. area 1,000 ft. 380

Bethnal Green—42 to 50 (even), Pollard's-row, f. r. 2118 p.s. 1,535

By D. WAREY & SONS. Finner—Radclosure of 15a, 2r. 0p. 1,040

By JAMES H. HARRIS. Ropley, Hants—The Little Grove Estate, 148a, 2r. 15p, f. 3,000

By C. D. FIELD & SONS. Bermondsey—136, 138, and 150, Fort-rd., ut. 47 yrs, g.r. 215, r. 225 p.s. 670

216 to 222 (even), Fort-rd., ut. 45 yrs, g.r. 217, 16a, r. 2143 p.s. 950  
12, 14, 24 to 30 (even), Esmeralda-rd., ut. 45 yrs, g.r. 230, r. 2192 p.s. 1,295

By NEWBOLD & HARDING. Hoxton—25 to 32, Charles-st., and 2, Leverington-place, f. r. 2150 p.s. 2,130

St. George's—65, Church-st., ut. 85 yrs, f. r. 210, r. 250 p.s. 500  
Wood Green, Nightingale-road—F. r. 223 p.s. 350

By E. STIMSON. East Dulwich—118, Crystal Palace-road, ut. 78 yrs, g.r. 225, r. 225 p.s. 230

Peckham—67, Montpelier-rd., ut. 61 yrs, g.r. 228, 10a, r. 238 p.s. 220

Tulse Hill—14 and 46, Arlington-rd., f. r. 274  
Brixton—30, Barwell-rd., ut. 83 yrs, g.r. 25, 6a, e.r. 238 p.s. 160

West Norwood—3, York-rd., ut. 91 yrs, g.r. 212, r. 225 p.s. 1,050  
Bermondsey—89, Abbey-st., f. r. 228 p.s. 330

By C. C. & T. MOORE. Commercial Road—Nos. 321 and 323, and 2 and 4, Bromfield-st., ut. 46 yrs, g.r. 200, r. 2168 p.s. 750

St. George's-in-East—148 to 151, St. George's-st., f. r. 2112 p.s. 1,170

Ratcliff Broad-st.—"The East India Arms," p.h., c. r. 250 p.s. 1,400

1, 3, 7, 75, and 99, Broad-st., c. r. 298 p.s. 1,010  
8, Butcher's-row, c. r. 250 p.s. 350

21 and 23, St. George's-lane, c. r. 254, 12a, p.s. 310  
6, John-st., c. r. 236 p.s. 480

Row Road—No. 179, c. r. 225 p.s. 500  
Whitechapel—1 to 7 (odd), Black Lion-yd., c. r. 224, 10a, p.s. 560

1 and 7, Black Lion-yd., East, c. r. 240 p.s. 440  
4, 6, and 8, Black Lion-yd., f. r. 228 p.s. 630

Stepney—116 and 120, Bromley-st., ut. 8 yrs, g.r. 24, 15a, r. 252 p.s. 125

JUNE 14.—By C. & H. WAITE. Worplesdon—"Perry Hill Cottage," f. r. 230 p.s. 680  
Brixton—6, 8, and 10, Russell-grove, ut. 31 yrs, g.r. 212, r. 285 p.s. 820

Southwark—8 and 4, Hayles-st., ut. 24 yrs, g.r. 210, r. 238 p.s. 305  
10, 11, and 12, Hayles-st., ut. 28 yrs, g.r. 212, r. 231, 12a, p.s. 565

Lambeth—84, Regent-st., ut. 18 yrs, g.r. 24, 4a, r. 238, 10a, p.s. 125

By TOSIN & SONS. Mile End—106, 111, and 113, Jamaica-st., ut. 20 yrs, g.r. 212 245

By NORRIS, TASTY, & GLENN. Willaden—3, St. George's and plot of land, area 38,000 ft. 1,000

By W. A. BLAKEMORE. Westminster—79 and 81, Pansbury-pl., ut. 36 yrs, g.r. 210, 10a, r. 2110 p.s. 1,000

[Contracts used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.p. for unexpired term; p.s. for per annum; y. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

The Society of Engineers.—Arrangements have been made for the members and associates of this Society and their friends to visit the East London Waterworks at Lea Bridge, Walthamstow, and Waltham Abbey, on Thursday, the 27th instant.

#### MEETINGS.

SATURDAY, JUNE 22. Glasgow Architectural Association.—Excursion to Dalzell House, Motherwell, Hamilton Palace, Bothwell Castle, and Bothwell Church.

TUESDAY, JUNE 25. Builders' Clerks' Benevolent Institution.—Special General Meeting of the donors and subscribers for the election of a pensioner. 7.30 p.m.

WEDNESDAY, JUNE 26. Builders' Foremen and Clerks of Works' Institution.—Half-yearly meeting of the Directors. 8.30 p.m.

THURSDAY, JUNE 27. Society of Engineers.—Visit to the East London Waterworks at Lea Bridge, Walthamstow, and Waltham Abbey. FRIDAY, JUNE 28.

Society of Arts.—Concursione at South Kensington Museum. 8.30 p.m.

SATURDAY, JUNE 29. Architectural Association.—Third vacation visit to the Halls of several City Companies (see advt).

#### Miscellaneous.

Water-Supply and Sewage System of Swedish Towns.—The Swedish technical journal, the *Helsingborg*, of Stockholm, in referring to the hygienic condition of the towns of Sweden, furnishes some interesting, though somewhat startling, statistics respecting their water-supply and discharge of sewage. In Stockholm, for instance, no regular water-supply was established until 1861, the water being then drawn from the adjacent Lake Mälare, but the sewage works were not commenced until seven years after, and were, in reality, as regards the central and most populous part of the town, not completed until 1884. The cost of the water installation was 300,000, and that of the sewage works 200,000. The network of the former is 145,000 metres, and that of the latter 14,000 metres in length. In Gothenburg, the water and sewage works were finished in 1860, the cost of the former, though only 92,000 metres in length, being 123,000, and that of the latter, 7,000 metres, 75,000. Only twenty more towns in Sweden have a regular and continuous supply of water, water being in all others obtained from wells, ponds, &c., and in ten of the towns thus favoured, it is furnished from some adjacent lake by natural pressure; in the remainder pumping is necessary. In from 80 to 90 per cent. of the houses in these towns the supply is continuous. The consumption varies from 54 gallons at Udevalla to 40 gallons at Skövde per individual diurnally, being in Stockholm 10-10 gallons. In thirteen towns water for domestic purposes is furnished by the city free of charge, but in the remaining nine it is charged for, including Stockholm, the charge varying from 1 kr. (1s. 1d.) to 3 kr. (3s. 4d.) per room in the house annually. In one town alone, viz. Malmö, the water-rate is assessed upon the rent. The cost of maintenance and working is very heavy in Stockholm, viz., 12,000, a year; whereas in Gothenburg, with about half the population, the cost is only 2,000. Turning to the question of sewage, we encounter some startling facts, as of the towns boasting waterworks, no fewer than eight are utterly unprovided with sewers of any kind, including such important towns as Malmö, Lund, Linköping, and the two towns consuming most and least water named above. Needless to say such sanitary arrangements are also wholly absent in all smaller towns. Naturally such defective hygienic arrangements throughout the country cause our contemporary some anxiety; but consolation is found in the circumstance that "much has been done to improve the same in recent years, and that the death-rate in provincial towns is decreasing."

Salop County Surveyorship.—One hundred and twenty-five applications were sent in for this appointment, the committee of selection reducing the number to seven, and afterwards to three. These three gentlemen, viz. Mr. A. T. Davis, Borough Surveyor, Stratford-on-Avon; Mr. C. Law Green, Nuneaton; and Mr. H. T. Waklam, Garston District, Liverpool, attended the County Council meeting on the 15th inst., when the voting resulted as follows.—Davis, 35 votes; Waklam, 20 votes; Law Green, 1 vote. Mr. Davis was finally unanimously elected.

Appointment of Registrar of Patent Agents.—Mr. H. Howgrave Graham, Secretary to the Institute of Patent Agents, has been appointed by the Council as Registrar. The offices are at No. 19, Southampton-bdgs, W.C.

Society of Arts' Conversazione.—The annual conversazione of the Society of Arts is fixed to take place at the South Kensington Museum (by permission of the Lords of the Committee of Council on Education), on Friday, June 28.



**The London County Council.**—At the meeting of this Council on Tuesday last, the Improvements Committee recommended that the proposal of the Kensington Vestry for widening High-street, as a metropolitan improvement, at a cost of 380,000*l.* (no contribution being made by the Vestry) be not entertained, as the plan proposed was not the most economical one which could have been suggested, and not one which should be undertaken at the sole cost of the Metropolis. This recommendation, after some discussion, was adopted.—The report of the Main Drainage Committee referred to complaints as to the flooding of property, and the matter was referred back, with a view of ascertaining some means of preventing the floods.—The Bridges Committee reported that they had proceeded upon the resolution of the Council of May 7, instructing them to take into consideration the report of the Committee appointed by the House of Commons in 1884, expressing the opinion that three means of communication were absolutely necessary east of London Bridge, viz., a bridge at or near the Tower, a tunnel at Shadwell, and a tunnel at Blackwall, and to advise the Council which of the latter should be first constructed. The Committee, in considering the matter, had had regard to the fact that an Act of Parliament had been obtained for the construction of a tunnel at Blackwall, and that contracts had been entered into and purchases completed for property required for the approaches, amounting, approximately, to 150,000*l.* The Committee recommended:—"That the Blackwall tunnel take precedence of all other schemes of trans-communication, and that the Committee be instructed to consider the other schemes proposed, with a view of reporting as to their probable cost, and as to the order in point of time in which they shall be proceeded with." The recommendation was agreed to.—With regard to the two appointments of Engineer and Mechanical Engineer to the Council, it was, on the suggestion of the Chairman, resolved that the Main Drainage Committee and the Bridges Committee should each name a few members (including all the members of the Council who are engineers) to form a joint sub-committee to examine and consider the numerous applications made for the appointments, and to submit lists of names of the most eligible candidates to the Standing Committee for further consideration and report to the Council.

**Edinburgh Architectural Association Annual Excursion.**—The annual excursion of the Edinburgh Architectural Association took place on Saturday last, to Peebles and the vicinity. Arriving in Peebles about twelve o'clock, the party drove to Neidpath Castle, which was examined by the company, to whom explanations were given by Mr. David MacGibbon. He explained that it had originally been one of the keeps of the fourteenth century, and had been the residence of the Hays of Yester. It was an example of the L plan of the second period, built with very heavy walls, in some cases more than 10 ft. thick. The party also visited Drochil Castle, Lyne Church, and Roman Camp, Barns Tower, and Peebles churches. Drochil Castle, Mr. MacGibbon explained, had been built by the Earl of Morton shortly before his execution in 1551. He described it as intended for a palace rather than a castle, and an examination of its arrangements quite confirmed that view. The churches were examined under the conductorship of Mr. Hippolyte J. Blanc. He noted Lyne Church as one of a like kind to pre-Reformation churches found in various parts of Scotland. It was a structure of about the end of the fifteenth century, and was singularly devoid of architectural detail or ornamentation. In Peebles the party viewed the remains of the original parish church and other ecclesiastical edifices, returning home with the evening train very much pleased with their day's outing.

**Leek Cemetery Competition.**—The designs submitted to the Leek Improvement Commissioners for the laying out of the cemetery extension were laid before the general body of Commissioners at the meeting of the Board last week. The recommendation of the Markets and Estates Committee had been that the design "Out of the Noise" should be adopted, and this opinion was confirmed by the vote of the general body. The sealed envelope was then opened, and it was found that Messrs. W. Sugden & Son, architects, of Leek, were the authors of the successful design.

**The Cripples' Home, Marylebone-road.** The remodelling of this building, situate in the Marylebone-road, facing Madame Tussaud's Exhibition, and having the main entrance in Northumberland-street, has just been completed, and it is to be opened on the 29th inst. by H.R.H. the Princess Christian. The Institution has for its object the welfare of those who, by their pitiable condition, are prohibited from taking an active part in life, though in many other respects they equal and often surpass their friends outside in general intelligence, and keen and sensitive mental capacity. The "Home" has been partially rebuilt, the wing next Marylebone-road having been altered, raised, and arranged to work in with the new buildings, which now cover an area of upwards of 5,000 superficial feet, and contain some sixty rooms, with corridors and suitable offices, and comprising basement, ground, first, second, third, and fourth floors, the whole covered with a flat asphalted roof, enabling the inmates to have the benefit of fresh air and exercise. A hydraulic lift, by Messrs. Clark, Bunnet, & Co., has been provided for raising the patients to each floor, in addition to which there are two artificial stone staircases. The new buildings are fireproof throughout, the floors being covered with Gregory's wood-block paving. The sanitary arrangements are by Mr. G. Jennings, the heating by Messrs. Berry & Co. The architects, Messrs. Habershon & Fawcner, have paid special attention to the requirements of the institution. The design is Italian in style. The walls are faced with picked stock bricks, the dressings, portico, &c., being of buff terra-cotta, manufactured by the Hatherly Brick Company, Leicester. The original Cripples' Home (before the restoration) consisted of more than one house connected by doors and passages, and as the levels were not the same, there were steps in all directions, causing much inconvenience, and often danger, to the cripples. The building now erected is for 100 inmates, whilst every endeavour has been used to save labour on the one hand and give comfort on the other. The system of internal ventilation has been arranged by Dr. Routh. The new floors and all staircases are absolutely fireproof. The works have been carried out by Messrs. Gregory & Company, contractors, of Clapham Junction, at a cost of about 9,000*l.*, Mr. G. Reed being the clerk of works.

**The English Iron Trade.**—The English iron market is not much more active than last week, but it has not lost its general steadiness, and in some departments is even firmer. Business in pig-iron is moderate, buyers showing little disposition to advance it, and sellers being not at all anxious to sell, for the present at any rate. Scotch warrants have been firmer, but makers' iron shows some changes. Cleveland iron is a shade lower. The brands of other districts, notably Bessemer descriptions, keep firm. Manufactured iron is, on the whole, unchanged; although trade is slow, both Staffordshire and Welsh bars are 2s. 6d. a ton higher. Steel continues in moderately good demand. Rails have declined 2s. 6d. in price; on the other hand, wire rods have been advanced 2s. 6d., and billets and slabs as much as 7s. 6d., although business, with the exception of billets, is quiet. Some fresh orders for ships are still being placed, but buyers, as a rule, are reluctant. Engineers are doing a capital trade.

**Haddington.**—Mr. H. F. Kerr, whose interesting paper on Haddington appeared in the *Builder* last week, writes to say that, as we surmised and suggested by our foot-note on p. 446, an error occurred in the description of the boundary of the Friars' Croft, where the first clause had it "on the east." Mr. Kerr writes to say that it should read "west," that it is so in the Disposition quoted, and in his draft-paper. But there was an error in the transcription of the MS. sent to us, and the error was unnoticed by the author in the necessarily very hurried revision of the "proof" sent to him.

**A Valuable Treasure.**—Austrian journals state that a very valuable treasure has been unearthed at Szilagyomlyo, in Transylvania, consisting of a number of massive dishes, urns, &c., of gold of high artistic merit. The find is valued at 80,000*l.* It was in this locality that the famous so-called "Attila Treasure," now in the private museum of the Imperial Austrian family at Vienna, was discovered in 1794.

**A Church of Cast-steel.**—An ironworks at Hennegau, in Germany, has just completed a church manufactured from cast Bessemer steel. It is intended for the island of Manilla, where frequent earthquakes render a brick structure unsafe. After careful calculations, this steel church will, it is believed, be capable of resisting earthquakes of very severe nature. Its weight is 1,600 tons.

**"Tonks, Limited."**—Messrs. W. Tonks & Sons, of Birmingham and London, inform us that they have transferred their business to a Limited Company, by which it will in future be carried on, under the name of "Tonks, Limited." The shares are not open for public subscription, the whole capital having been subscribed for by the members of the families of the partners.

| PRICES CURRENT OF MATERIALS.                               |    |    |    |
|------------------------------------------------------------|----|----|----|
| TIMBER.                                                    |    |    |    |
|                                                            | £. | s. | d. |
| Greenheart, B.G. ....                                      | 11 | 0  | 0  |
| Teak, B.L. ....                                            | 11 | 0  | 0  |
| Sesquiu, U.S. ....                                         | 0  | 3  | 0  |
| Ash, Canada, ....                                          | 3  | 10 | 0  |
| Birch " ....                                               | 3  | 10 | 0  |
| Rim " ....                                                 | 4  | 0  | 0  |
| Fir, Dantais, &c. ....                                     | 2  | 0  | 0  |
| Oak " ....                                                 | 2  | 10 | 0  |
| Canada " ....                                              | 7  | 10 | 0  |
| Pine, Canada red " ....                                    | 3  | 5  | 0  |
| " yellow " ....                                            | 3  | 10 | 0  |
| Lath, Dantais, ....                                        | 4  | 10 | 0  |
| St. Petersburg, ....                                       | 5  | 0  | 0  |
| Wainscot, Riga, &c. ....                                   | 2  | 15 | 0  |
| Deals, Finland, 2nd and 1st, std. 100 " 4th and 3rd " .... | 9  | 10 | 0  |
| Riga " 2nd " ....                                          | 8  | 0  | 0  |
| St. Petersburg, 1st yellow " ....                          | 11 | 0  | 0  |
| " 2nd " ....                                               | 10 | 0  | 0  |
| " 3rd " ....                                               | 7  | 10 | 0  |
| Swedish " white " ....                                     | 9  | 0  | 0  |
| White Sea " ....                                           | 10 | 0  | 0  |
| Canada, Pine, 1st " ....                                   | 18 | 0  | 0  |
| " 2nd " ....                                               | 11 | 0  | 0  |
| " 3rd " ....                                               | 8  | 0  | 0  |
| " Spruce, 1st " ....                                       | 9  | 10 | 0  |
| " 3rd and 2nd " ....                                       | 7  | 10 | 0  |
| New Brunswick, &c. ....                                    | 15 | 0  | 0  |
| Battens, all kinds " ....                                  | 6  | 10 | 0  |
| Flooring Boards, sq., 1 in., prepared, First " ....        | 0  | 11 | 0  |
| Second " ....                                              | 0  | 8  | 0  |
| Other qualities " ....                                     | 0  | 6  | 0  |
| Cedar, Cuba, ....                                          | 0  | 4  | 0  |
| Honduras, &c. ....                                         | 0  | 4  | 0  |
| Mahogany, Cuba " ....                                      | 0  | 4  | 0  |
| St. Domingo, cargo average " ....                          | 0  | 4  | 0  |
| Mexican " ....                                             | 0  | 4  | 0  |
| Tobacco " ....                                             | 0  | 6  | 0  |
| Honduras " ....                                            | 0  | 6  | 0  |
| Rox, Turkey " ....                                         | 4  | 0  | 0  |
| Rose, Rio " ....                                           | 15 | 0  | 0  |
| Bahia " ....                                               | 14 | 0  | 0  |
| Satin, St. Domingo " ....                                  | 0  | 4  | 0  |
| Porto Rico " ....                                          | 0  | 9  | 0  |
| Walnut, Italian " ....                                     | 0  | 4  | 0  |

| METALS.                                                  |    |    |   |
|----------------------------------------------------------|----|----|---|
| Iron—Bar, Welsh, in London, ton " at works in Wales " .. | 5  | 5  | 0 |
| " Staffordshire, in London " ..                          | 4  | 15 | 0 |
| COPPER—                                                  |    |    |   |
| British, cast and ingot, ton " ..                        | 45 | 18 | 0 |
| Best selected " ..                                       | 47 | 0  | 0 |
| Sheets, strong " ..                                      | 43 | 0  | 0 |
| Chili, bars " ..                                         | 41 | 15 | 0 |
| Yellow Metal " ..                                        | 0  | 5  | 0 |
| Lead Sheet, English, ton " ..                            | 13 | 10 | 0 |
| SILVER—                                                  |    |    |   |
| Silesian, special " ..                                   | 18 | 0  | 0 |
| Ordinary brands " ..                                     | 17 | 17 | 0 |
| TIN—                                                     |    |    |   |
| Straits " ..                                             | 80 | 0  | 0 |
| Australian " ..                                          | 80 | 0  | 0 |
| English Ingots " ..                                      | 94 | 0  | 0 |
| ZINC—English sheet " ..                                  | 21 | 0  | 0 |

| OILS.                       |    |    |   |
|-----------------------------|----|----|---|
| Lined " ..                  | 20 | 15 | 0 |
| Cocconut, Cochiti " ..      | 26 | 10 | 0 |
| Ceylon " ..                 | 24 | 10 | 0 |
| Palm, Lagos " ..            | 24 | 0  | 0 |
| Rapeseed, English pale " .. | 26 | 10 | 0 |
| " brown " ..                | 25 | 0  | 0 |
| Cottonseed, refined " ..    | 25 | 15 | 0 |
| Tallow and Oleine " ..      | 19 | 0  | 0 |
| Lubricating, U.S. " ..      | 5  | 0  | 0 |
| " refined " ..              | 7  | 0  | 0 |
| Tar—Stockholm " ..          | 1  | 3  | 0 |
| Archangel " ..              | 0  | 15 | 0 |

**TENDERS.**  
[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                                                                  |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>BROMLEY (Kent).</b> —For laying 600 ft. of 9 in. stone-ware pipe sewer, with manholes, &c., in Bird-in-Hand-lane, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor. |          |
| Woodham & Fry " ..                                                                                                                                                               | £116 0 0 |
| A. Attwood " ..                                                                                                                                                                  | 104 18 6 |
| A. Palmer " ..                                                                                                                                                                   | 104 0 0  |
| T. Lansbury (accepted) " ..                                                                                                                                                      | 91 0 0   |

|                                                                                                                                    |            |
|------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>CAMBRIDGE.</b> —For erecting new Mission Church in St. Barnabas' Parish, Cambridge. Mr. E. R. Loftus Brock, F.S.A., architect:— |            |
| Rynoch & Co., London " ..                                                                                                          | £2,323 0 0 |
| Boil & Son, Cambridge " ..                                                                                                         | 2,093 0 0  |
| Allen & Son, London " ..                                                                                                           | 1,935 0 0  |
| Sandall, Cambridge " ..                                                                                                            | 1,900 0 0  |
| Batchelor, London " ..                                                                                                             | 1,878 0 0  |
| Wade, St. Neots " ..                                                                                                               | 1,533 0 0  |





LONDON.—For alterations and additions to premises, 53, High-street, Clapham, for the Alliance Banking Co., Limited. Mr. Fred. Finch, architect.—  
Kynoch & Co. (accepted) ..... £2,580 0 0

LONDON.—For forming public park for Vauxhall, in South Lambeth road. Mr. C. H. Townsend, architect.—  
Adamson ..... £272 0 0  
Chappell ..... 868 0 0  
Collis ..... 863 0 0  
Nightingale ..... 839 0 0  
Downs ..... 833 0 0  
Higgs & Hill ..... 779 0 0  
Kynoch & Co. ..... 740 0 0

LONDON.—For alterations at the "Wagon and Horses" public-house, Newington Butts. Mr. C. Young, architect, 70, Finsbury-pavement.—  
Hedges ..... £2,545 0 0  
Spencer & Co. ..... 2,370 0 0  
Colman ..... 2,250 0 0  
Draw & Cadman ..... 2,100 0 0  
Worsley ..... 1,850 0 0  
Mower & Son ..... 1,889 0 0  
Higgs ..... 1,873 0 0

ORPINGTON.—For a detached residence at Scods Hill, Orpington, Kent, for Mr. E. Stanley Caton, Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street.—  
Knight ..... £1,532 0 0  
Somerford & Son ..... 1,479 0 0  
Cromwell ..... 1,474 0 0  
Holt ..... 1,470 0 0  
Osway ..... 1,440 0 0  
Payne ..... 1,300 0 0  
\* Accepted subject to modification.

ORPINGTON.—For decorations to a house at Orpington. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street.—  
Somerford & Son (accepted) ..... £118 0 0

ORPINGTON.—For additions and alterations at a house in High-street, Orpington, Kent. Mr. St. Pierre Harris, architect and surveyor, Basinghall-street.—  
Johnson ..... £287 0 0  
Treadwell ..... 169 0 0  
Somerford & Son (accepted) ..... 165 0 0

ST. ALBANS.—For the erection of a baker's shop and cottage, Alma-rows, for Mr. S. Norman, Mr. W. A. Fisher, architect, Hemel Hempstead.—  
Savage, St. Albans ..... £546 15 0  
W. & A. Cox, Luton ..... 395 10 0  
Bushell, St. Albans ..... 378 0 0  
Chamberlain, St. Albans (accepted) ..... 370 0 0

STRATFORD.—For repairs and decorations at the Conference Hall, West Ham-lane, Stratford. Mr. F. Borcham, architect.—  
Hoskings ..... £298 0 0  
J. Holloway ..... 248 0 0  
A. Reed (accepted) ..... 219 0 0

SUTTON.—For additions to "Standish," for Mr. W. A. W. Scott. Mr. Frederick Colyer, architect, 18, Great George-street, Westminster, S.W.—  
S. Page, Croydon ..... £361 10 0  
S. Bird, London ..... 338 0 0  
R. J. Humphris, Sutton ..... 310 0 0

SWANLEY (Kent).—For repairs and decorations to a private residence, near Swanley, Kent. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street.—  
Somerford & Son ..... £245 0 0  
Taylor ..... 210 0 0  
Inna ..... 180 0 0  
Lowe (accepted) ..... 177 0 0

TOTTENHAM.—For rebuilding the "Wallington," Green-lanes, for Messrs. Hoggins & Co. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-street, Leadenhall-street, E.C. Quantities supplied.—  
Patrick & Son ..... £3,049 0 0  
Peto Bros. ..... 2,940 0 0  
Nightingale ..... 2,868 0 0  
Ashby & Horner ..... 2,680 0 0  
Futman & Pothersham ..... 2,673 0 0  
Jackson & Todd (accepted) ..... 2,948 0 0

UXBRIDGE.—For pulling down and rebuilding back portion of No. 168, High-street, Uxbridge, for Mr. W. Coad. Mr. A. Harry Heron, architect, Uxbridge.—  
First Contract.

Penny, Ealing ..... £824 0 0  
Kearley, Uxbridge ..... 780 0 0  
Hardy, Croyley ..... 718 0 0  
Brown, Harefield (accepted) ..... 670 0 0  
Hall, Uxbridge ..... 666 0 0  
Bailey, Ealing ..... 598 0 0

Cricket Pavilion, Eastbourne.—We have received a list of tenders for this work, but, as it is unaccompanied by the name and address of the sender, we cannot insert it.

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#### TO CORRESPONDENTS.

S. H. (you do not append your name and address to your communications).—G. J. W. F. P. J. E. J. W. Maratire (if we were in the habit of acting upon anonymous communications or of undertaking any such work as that so coolly asked for in your letter we should certainly not adopt your sinister suggestion to state the locality of the property upon which you wish us to report. We do not make surveys of property and publish the results in our columns, to suit the convenience of would-be buyers or sellers. If your letter be really written in good faith you had better consult and pay an architect or surveyor. H. F. K.—H. H.—S. A. (should send amount).—C. & S. (too late).—S. & S. (answered by post).—G. W. & Co. (we cannot answer your question).—H. H. Oldbury (not required).—A. L. and B. (shall have consideration).—J. E. M. (we cannot).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, and necessarily for publication. We are compelled to decline pointing out books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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# The Builder.

VOL. LVI. No. 2423.

WEDNESDAY, JUNE 29, 1898.

## ILLUSTRATIONS.

|                                                                                                                           |                           |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Altar-piece, Church of San Bernardino, near Siena (From a Photograph) .....                                               | Double-Page Typo-Gravure. |
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| Houses, Lodge, and Stables, "Flymyard," Bromborough, Cheshire.—Messrs. Ball & Roper, Architects .....                     | Double-Page Photo-Litho.  |
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### In the Cathedral at Chartres.



HERE, if anywhere, one ought to realise what a cathedral is that still serves the same purposes for which it was built. Here are chapels each with its altar; here, from morning till night, are worshippers, now more, now less; now perfumery, now expressing in every line of the kneeling figure, the bowed head, and the clasped hands, a devotion, perhaps a sorrow, for which this alone is a fitting refuge. Here are lamps which burn for ever, here is the Blessed Tunic, and here the sacred image of the Black Virgin, and the thrice sacred image of Our Lady of the Crypt. And the great shrine that holds them all is worthy of them,—and of things even more sacred, if such be conceivable.

The Cathedral is said to be one of the largest in France; but what do a few feet more or less signify in a place like this? You cannot measure grandeur by the yard, nor weigh out solemnity in a scale. When you stand in the mighty nave, dim with the painted glass that has been there for six centuries, or when you pace the grand sweep of the chevet, with a succession of chapels on the one hand and the wonderful choir-screen on the other, while always overhead are the strong and nervous lines of the early vaulting, you are not concerned with statistics; you only think that nowhere, save perhaps at Westminster, has man reared a temple more worthy of his noblest conception. It is true that the choir was spoilt last century by some one who thought his tawdry stucco and his theatrical insincerities of sculpture not out of place in this solemn temple, but still so much is left untouched that this barbarity is the more easily condoned.

The Cathedral is dedicated to the Virgin; hers is the sacred tunic, and hers the two celebrated statues. To her honour all the splendid sculpture and painted glass minister, most of it directly, the rest through the Son of whom she was mother. All those solemn figures which adorn the three entrances, whether draped in the long, thin, and straight folds which speak of Byzantine influences, or in the less stiff, but still formal, manner of a century later; all the prophets, priests, and kings; all the saints and martyrs who "stand

at a gaze staying," or sit in hazardous positions, or for ever suffer the tortures with which they sealed their faith,—all these are but the means by which the master workmen led the minds of the faithful to the contemplation of one central figure,—the Blessed Virgin. But what a page of architecture is here unrolled! At the west doors stand long, gaunt figures in an archaic style, derived from the East, and clearly retaining traces of Classic feeling in the acanthus-leaves and the ornaments of their pedestals. Gothic they are, but of a Gothic not yet quite free from the Classic from which it sprang. Go to the north entrance, and, amid its wealth of figures, and sculptured niches, and bases, and canopies, you will find work in regard to which a close scrutiny will not decide whether it is original, or inserted at the Renaissance—whether it is Classic still retained, or Classic reintroduced and modified to harmonise with its earlier surroundings. Not less rich, but less puzzling, is the south entrance. The whole of the work is Early, but here it is undeniably Gothic. All the porches are replete with figures; there are thousands of them; it is a wonder they could have been completed during the prevalence of a single phase of architectural style, and yet, owing to their subordination to their parent, Architecture, they produce an effect quiet and yet grand; not gaudy, restless, and grandiose, as would have been the case had the decorator of the choir been at work.

So, too, inside. In the structure itself, but little sculpture is applied. There are great griffes to the bases of the huge columns, and the capitals are carved with the dignified simplicity of early French work,—a deep band for the great central column and a smaller one for the four shafts attached to it. But look at the screen surrounding the choir. On its outer side it is a mass of carving, more than 200 ft. long by some 15 ft. high, and not one square foot untouched by the chisel.\* This, too, is in honour of the Virgin. It sets forth her whole history, from the announcement of her birth, in the first compartment, to her coronation, in the fortieth. Apart from its intrinsic merits, the whole work is of singular interest from its date (1524, *et seq.*) and the manner in which Gothic here melts into Renaissance.

The screen is divided into wide bays by shafts. The lower part of each bay is panelled; the upper part is elaborately canopied, and the space below the canopies is filled

\* An illustration of part of this screen was given in the *Builder* for June 14, 1884.

with groups of statuary which already seem to be casting off the restraints of architectural composition, and to be striving for an independent existence. The eight westernmost bays on each side seem to be somewhat earlier than the rest. The panelling of the bays is Gothic,—late Gothic, it is true, but Gothic,—with cusps and crockets and bases; and the change towards Renaissance is chiefly observable in the caps, and more particularly in the shafts which divide the bays. These are composed of groups of shafts enclosing plain surfaces; the shafts still have Gothic bases, and blossom into Gothic pinnacles at the top. The upper plain surfaces, too, have Gothic panels with flamboyant heads; but the lower are all carved with beautiful Renaissance designs in low relief, some retaining the general appearance of tracery, others showing a decided inclination towards the birds and fishes, and urns and flowering creatures that form the staple of Italian ornament. The effect is curious. At a short distance the work looks like late Gothic; it is only on close inspection that you see how the new spirit has already seized it. Further to the east the change is more visible; here the panels of the bays are obviously of the Renaissance; the lines of the tracery in the wide bays still have bases; but they are all covered with carving in which no trace of Gothic is left. The large shafts, too, are no longer groups of smaller ones, but are square pillars, each face sunk, and delicately carved. At stated intervals, however, the old idea is retained, and there still occurs, as before, a group of shafts. But the very shafts have felt the change of style; the bases are different; strange little wreaths embrace them, looking at a distance like small crocketed canopies; the caps are all in the new style, and so are the canopies over the statues, all retaining the old arrangement, but all wrought in the new fashion. In the broader spaces of the work the new style reigns supreme. There is no feeling of Gothic in the round panels that enclose the heads of "Titus Cæsar," or "Domitianus Cæsar," or "Neron le Cruel Cæsar." They may, perhaps, even strike us as somewhat incongruous companions to the saintly personages that pose above them. But the carving itself,—no words can describe its delicacy, both of fancy and workmanship. There are shells and bands and flowers; dainty little cupids, and spears and shields; vases and dolphins and griffins, and all the devices which the exuberant imagination of that age produced. And they are all carved



in low relief with a minuteness, a firmness, and a precision that would defy all but the most skilful draughtsman to reproduce, even full size. How different this from the great unbroken surfaces of the massive pillars of the church, or the large, vigorous leaves that adorn their capitals.

But not less wonderful than the infinitude of carving is the vast array of painted glass. Hardly a window in the enormous pile but has its glass, placed there when it was built. What is not of the thirteenth is of the twelfth century, filling 175 windows, large and small. One hundred and seventy-five stained-glass windows in one church—think of that. The windows, too, all tend to the glory of the Virgin, and repeat in brilliant colours the stories told in sober stone without. In the aisles they are crowded with histories from the Bible and legends of the Saints. The little figures show, by their stiff attitudes and their impossible joints, that the men who drew them possessed an ignorance of anatomy and biology as cheerful and profound as do those who worship beneath them at the present day.

In keeping with the small figures are the minute diapered backgrounds interlaced in blue and red; and, owing to the quantity of lead lines necessary for the work, the dirt has collected during the six centuries of their existence till in many places the light can hardly struggle through at all, and where by accident some trifling scrap of glass has gone the rays come through with dazzling intensity. They are indeed "rich windows that exclude the light." Of far simpler design are the great clearstory windows. Here, as a rule, a single figure occupies the field. Above and below are accessories in the form of an incident in the life of the personage represented, but all is larger, and more easily understood. This is painted glass at its best—simple design, noble (if conventional) drawing, and splendid colour. The effect of the long array of saints in brilliant robes, and warriors in the glowing garb of heraldry, surrounded by many-coloured borders, and adorned with all the splendour that an age of gorgeous costume could suggest, is indescribably imposing, and is not a little enhanced by the unconscious knowledge that as to-day they shed their light, so have they shed it on six centuries of worshippers.

It must ever be remembered that all these embellishments, which we English are apt to regard merely as embellishments, have here at Chartres a very living meaning, and furnish texts for discourses to the faithful from those who compile the pilgrims' guides. And the two celebrated statues, that of the Crypt and that of the Pillar, call forth feelings of very devout veneration,—though whether they who adore first one and then the other; who hang up in the crypt a lamp to burn night and day, and then go and kiss the cold Pillar as though it were warm flesh and blood,—whether these good people think these were two distinct Virgins, or whether their minds are sufficiently subtle to regard the two statues as two ways of presenting one great truth, it would be useless to inquire, for all religions have their mysteries. But the two famous statues do not claim all the worshippers. Every chapel has its saint, and to every saint come many devotees. Now it is some well-dressed lady from the town; occasionally (but very seldom) it is a man; and then perhaps it is a peasant woman in blue apron and white cap, carrying a little child who, regardless of the sanctity of the occasion, actually cries for the candle which its mother offers to the saint, as though it were a toy brought for its own tiny delectation! These are the folk for whom all this splendid architecture grew, and not for people who go round our English cathedrals, and wonder what those recesses called chapels were used for, and think the place very fine, and the glass very old, and the statues very curious illustrations of the strange ideas people had in those days.

No, it is here at Chartres, the bourne of many pilgrimages, that the real significance of Gothic architecture can best be caught; and only by the blaze of a great procession

can the full value of length and loftiness be fully realised. On the last day of May (the month of Mary), the black statue is taken from its pillar and carried in procession. Its ordinary garb is taken off, and, clad in cloth of gold, borne by four, beneath a gorgeous palanquin, it makes the round of the church. Before it go hundreds of girls in white, all discreetly veiled and carrying each a lighted taper. In front goes a grand functionary in a cocked-hat and splendid costume, armed with a staff with which he now thumps the floor, and now clears the way, and after them come the little boys in red cassocks and lace surplices, and as they go they sing a monotonous litany, soon drowned in the roaring of the shaven priests who follow, still all with candles; and the look of disgust which a priest gives when the hot wax falls on his hand in the solemn procession is a thing to remember. Among the priests is one who carries a wind instrument from which now and again he produces a mellow note to keep the chanters in tune. At last comes the black statue,—the black Virgin and the black Child,—and as it passes, down the people go, down on their knees to the black Virgin, and bow their heads till she be passed. And the candles light up the massive pillars, and even flicker on the vaulted roof; and behind the blazing choir are the dark spaces of the chevet and the deserted chapels of the minor saints. Down the nave, and up the aisles, and round the sculptured screen of the choir goes the long and brilliant line, and having made the full circuit, it gradually melts away, for the girls disperse, and only those who belong to the church remain with their tapers to see the statue come to rest before the pillar on which she generally stands. And while she waits in front of the pillar, the faithful flock towards her and rub their rosaries reverentially on her robes. And presently a priest comes, and, as far as he can do it (for the faithful flock in a great crowd), he takes a rosary in each hand and presses them, one against the black hand of the Virgin and the other against the black hand of the Child, and then he crosses hands and presses again, so that each rosary may touch each sacred hand. And the faithful struggle who shall be first to have the mysterious virtue pass into their rosaries. And this done the faithful pass round to the pillar, now without its image, and the pillar they kiss as though its chilly surface were the face of the beloved. On both sides they kiss it, with lingering kisses mostly,—though some young boys care no more for it than if it were their sister. Young and old come, rich and poor, but they are all women and children and boys,—no men. And babies are held forth to kiss it; and a little child comes, who can hardly lean over the railing far enough to touch it with the points of her little lips. And at the sight of all this the heart grew sick, that this, too, should be part of the noble temple as much as its carved statues and its beautiful glass.

But the last rosary has been blessed, the last kiss given; the golden robes have been removed, and the daily garments replaced; the unwieldy statue has been carried up with much loss of breath, and placed upon the pillar; a solemn gloom once more envelopes the church, save where the light flickers from the candles of those busied with the black image; the great door has shut, and once more the statues of the porch seem, on either hand, to gaze with melancholy eyes on the stranger who steps forth from the dim Medieval world again into the glare of every-day modern life.

#### Appointment of a Diocesan Surveyor.

A meeting of the Archdeacons and Rural Deans of the Diocese of Norwich was held on Saturday last for the purpose of appointing a Diocesan Surveyor, in the place of Mr. E. P. Willins, deceased. The following were the candidates:—Messrs. E. J. Colman (Lynn), T. Garratt (London), H. Galey (Bayswater), A. J. Lacey (Norwich), H. Olley (Yarmouth), J. B. Pearce (Norwich), and J. E. Teasdale (Yarmouth). The result of the voting was that Mr. Arthur J. Lacey was elected.

#### THE LIFE OF VIGNOLES.



THE author of the biographical memoir\* of the late C. B. Vignoles concludes his work with the remark that "with C. B. Vignoles the romantic era of modern engineering science may be said to have passed away." The remark indicates rather aptly the nature of the interest attaching to the biography. As far as the earlier era of modern engineering may be considered as romantic,—and it certainly was so in a sense, in regard to the novel prospects and untried fields of enterprise which it threw open—no figure could better represent the romantic side of it than that of Vignoles, half-soldier half-engineer, excitable in nature, rash and sanguine in his speculations, half ruined in middle life by his own quixotic daring in taking up nearly the whole financial responsibility of a new line rather than see the enterprise checked, and then, with untiring enterprise and energy, recovering in foreign work the success which had slipped from him in England. He was constitutionally of a combative nature, and his whole life seems to have been more or less of a fight; but, like not a few other hard fighters, he lived to a good old age, dying after three days' illness in his eighty-third year, and after having enjoyed almost uninterrupted good health all his life, in spite of often going through fatigue and overwork, during the great period of railway struggle, such as would have permanently impaired any but a very strong constitution.

"Mens sana in corpore sano" could hardly, however, have been applied to Vignoles. His character wanted balance and self-restraint, more particularly in earlier life, as the personal details in regard to his conduct in various circumstances fully indicate, and as his biographer admits. Most of the difficulties and drawbacks which he met with in his professional career seem to have been more or less of his own making, or at least might have been escaped with more of prudence and forethought than he usually displayed. His faults, however, were of the kind which the world has never had the heart to judge hardly; the faults incident to impetuosity and insouciance. He might probably have built up a large and solid fortune, but he was habitually careless both about making and about spending money; not looking after his own interests in the making, and dealing it out lavishly when it occasionally flowed in of its own accord. It is characteristic of him to read, in regard to his Russian professional journeys, that "he was served as zealously in Russia by post-boys as he invariably was in all parts of Europe, as his *pourboires* were always on a very liberal scale." Equally characteristic was the way he got up his scheme for the Kieff bridge over the Dnieper, to bring it before the Emperor of Russia. He heard of the Emperor's desire for a bridge at Kieff from an old brother officer who was Consul-General at Warsaw, and at once set to work on a set of geometrical drawings for a bridge, with a perspective view showing it as it would be when completed. But, says the biographer, "Vignoles never did things by halves, and in this case, when the drawings were finished, he had them mounted on silk, and bound superbly in morocco leather, with an embossed gilt title over the arms of Russia. The portfolios were placed in oak cases lined with velvet," &c. All this, be it remembered, for a chance commission, merely to bring the thing before the Imperial eye in a striking manner. This might have been mere worldly shrewdness in some people; we do not think it was merely that with Vignoles; it was a part of the man's luxuriant nature, which could not be content to do things in a plain and ordinary manner; and we surmise that it was not done so much to dazzle the Imperial eye, as for his own personal

\* The Life of Charles Blacker Vignoles, F.R.S., F.R.A.S., M.R.I.A., &c., Soldier and Civil Engineer, formerly Lieutenant in H.M. 1st Royals, Past-President of the Institution of Civil Engineers. A reminiscence of early railway history. By his Son, Olinthus J. Vignoles, M.A. London: Longmans Green & Co. 1889.



pride and satisfaction.\* Equally characteristic is the incident named in a family letter, of his unexpected appearance at his family Christmas dinner in weather in which the roads were all but blockaded with snow and all the mails stopped. Vignoles had been in Ireland, but had promised to join his family on Christmas Day, and he had, as his daughter writes, posted day and night through the storm from Holyhead on purpose to keep his promise; arriving just in time. These are only a few of the many indications we get in the "Life," of his genial and exuberant nature.

Many who are familiar with the name of Vignoles as an engineer are probably not aware that he began life as a soldier, and had his share of sharp fighting. It does not appear that much is known as to his early education; he seems first to have been articled to a lawyer, and a year or two afterwards is found studying at Sandhurst, and subsequently with a commission as ensign, but there seem to be no materials for a connected narrative, nor can it be said that the information that is given is very lucidly arranged. That is a fault in the book throughout; it is written in a simple and unpretending style, but not in good literary form, and is consequently somewhat troublesome and inconsecutive reading. Vignoles's own letters, where they are quoted, as they often are at length, are always good reading, and are exceedingly spirited and picturesque in style. This is especially so in regard to the letters of his military period, which constitute an amusing medley of descriptions of all kinds of things, from pretty serious skirmishes to private theatricals, and his hurried kind of half-clandestine marriage at Gosport in 1817, with the lady to whom he had long been privately engaged, and who seems to have been worthy of a far more ceremonious reception into the family than was accorded to her. But of the circumstances which led Vignoles to abandon the military for the engineering life, which is naturally the most interesting question to the majority of readers of the book, we can gather no certain information at all; the author seems to have little but surmises to offer, and even these are given in so random and unconnected a manner that it is difficult to follow them. All we can collect is that Vignoles became at an early period dissatisfied with the prospect of a military career, and disposed to make the best of his talents in any other direction in which he could find an opening for them, and that he developed gradually into his new profession through the experience and interest gained in the course of various odd commissions in surveying, and that on August 21, 1821, he writes from St. Augustine, Florida, that he is nominated Civil Engineer and Surveyor for that city. In fact, he seems to have dropped into a professional career and professional work exactly in the way that poor Martin Chuzzlewit attempted with more confidence and less success, viz. by going where he thought engineering work was wanted, and turning his natural talents and his knowledge of surveying to account; though where and when he procured this knowledge there is really nothing in the book to tell us. He appears therefore to be a rather remarkable example of a talented and in many respects successful engineer who received no regular training for the profession, but learnt it as he went on. The result, at all events, speaks highly for his native talent and energy.

As "a reminiscence of early railway history," which is the subordinate affix on the title-page, the Life is defective, because the writer is not practically acquainted with the subject; and in this respect it would have been better if the biography had been entrusted to some one having more practical acquaintance with engineering work. A good deal is told which is interesting, but it is told in a very desultory and rambling fashion. Before the actual railway work is entered on at all, it is said to read

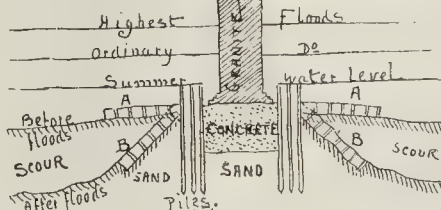
of the comparatively early death, hastened by anxiety and trouble from various causes, of the noble-minded woman who had been Vignoles's first love and his first wife. Few will read the volume without a regret that such a true and high-minded wife as she evidently was should have lived only during the troubled times of her husband's life, and not survived to share his success.

The second section of the book deals with Vignoles's English railway work, a class of work into which he first entered by executing some surveys under Rennie the younger, and he was resident Engineer on the Liverpool and Manchester line from 1825 to February, 1827. It is the writer's object, naturally enough, to show that Vignoles in reality took a more important part in this and some other early railway schemes than is generally accorded to him; we are quite willing to believe that this may have been the case, but the evidence for it (so far as it can be called evidence) is given in such a desultory and rambling manner that it is impossible to make anything decisive out of it one way or another. It is noteworthy that he had, more than half a century ago, formed a decided opinion in favour of the feasibility of a tunnel under the Mersey, which is certainly one indication that his ideas were ahead of his contemporaries. It is noteworthy that he also had the idea of a railway-bridge over the Mersey at Runcorn Gap, just where such a bridge was in 1880 constructed.

The incidents mentioned in this part of the work as to early railway travelling are in some instances new, though they are of very much the same type as the reader of any history of railroad undertakings is by this time pretty well used to. The author, however, has been enabled to add to his work some old engravings

system to the cross-sleeper system, or could be blind to the fact that the cross-sleeper system practically spreads the bearing of the weight over the whole ground covered by the train, instead of over a strip under each rail only, while the construction itself forms the most complete and continuous tie between the two rails. The author does not blink the facts as to the disuse of the continuous sleeper system; indeed we believe he goes rather farther than the fact in saying that the whole Great Western system has been pulled up and replaced by cross sleepers, as we believe this change is not yet completely made; but he evidently thinks that this has been all a mistake, and that Vignoles was right in his theory. Experience, however, has settled what theory ought to have settled from the first. In a true scientific sense, the continuous sleeper never had a leg to stand on, and its demolition was a foregone conclusion.

In the third portion of the book, dealing with Vignoles's foreign work, the most interesting chapter is that in regard to the bridge over the Dnieper, before referred to. The difficulties of forming the foundations, before the days of iron caissons, were very great, owing to the sandy nature of the bottom and the great rise and velocity of the water in flood seasons. In this work Vignoles employed a system then largely in use by the Dutch engineers for protecting foundations from scour, of forming what were called fascine "mattresses," consisting of large woven baskets of great size, (in this case 40 ft. by 20 ft. in area), divided into square compartments like gigantic wine-baskets, which were loaded with stones and sunk on either side of the foundations of the piers. The accompanying rough sketch from the diagram given in



of railway stations &c. in 1832, from the "Bills Collection" at Liverpool, which give a new interest to the subject.

There is more special interest in the account of Vignoles's experience and opinions in regard to the laying of rails for a permanent way. It would surprise many readers to learn that Vignoles had in the first instance been, like others of his contemporaries, much taken with the idea of a rigid rail laid on stone supports. Among those who advocated this system, however, he was the first to see and acknowledge the error. Of late years we have heard propositions for a rigid rail and an elastic wheel, but they seem to have come to nothing. A rigid rail and a rigid wheel could never have even been momentarily supposed possible with the high speeds of the present day. But Vignoles was more obstinately heretical on another point, that of the superiority of longitudinal sleepers to cross ones. Of course along with the longitudinal sleepers went the Vignoles rail, which was really a clever thing, but it was only suited for longitudinal sleepers and only for a rather light traffic, unless the rail were rolled at a weight of section which would render the cost pretty nearly prohibitive. Still the Vignoles rail has played and is playing a considerable part in the world, in those regions where cheap construction is one of the first objects and where high speeds and heavy engines are not part of the programme. As to the longitudinal sleepers, it is necessary to bear in mind that those who discussed the question at the period we are speaking of had to do with much lighter engines and carriages than those of the present day, before we can understand how able practical men could seriously prefer this

the book shows the position in which these were first placed, and the angle to which they subsequently deflected under the influence of the scour; A representing their original position, and B the position to which they subsided. The author says that "in all other respects they remained immovable, and there they remain to the present day, a bulwark against the tumultuous spring floods. It is really a curious sight, in the middle of summer when the water is very low, to observe how the fascine work has formed, as it were, islands of greenery round each of the shallow water piers. This is easily understood, as the interstices between the stones in the cells have gradually been filled with sand and mud, which has nourished the branches, and converted the mattresses into living brushwood." The then emperor took a great interest in the work, and showed a flattering confidence in his English engineer, giving him *carte blanche* to carry out the work in the manner he thought best, but it is recorded that Vignoles suffered heavy pecuniary losses from the then rampant system of bribes to officials of every class, without which nothing could be got done or agreed to at all, even in operations nominally under State control. Vignoles's long absences from England over this work appear also to have had a very prejudicial effect on his position in England, and we are told he had the mortification of seeing many of his schemes and proposals in connexion with English engineering passing into other hands, whilst their original author and designer was in great measure pushed aside. Perhaps the constitutional inability to look with prudence after his own interests, which had more or less injured him all

\* He says in a letter in his earlier days, "I must tell you that Petitval and myself are much improved in our drawing. I made a magnificent title to the Graves' plan, and the map was the admiration of all who saw it."



through life, had something to do with these disappointments also. In 1869, however, at the age of seventy-six, he received the honour of election as President of the Institution of Civil Engineers.

As a record of the life and character of a man who filled a very large place in the engineering work of his day, and who was in other ways a man of very remarkable and original character, the "Life" will have permanent value and interest, though written, as we have already implied, in a somewhat confused and inconsequent style; and making all allowance for natural partiality on the part of the writer, it certainly leaves the impression that Vignoles had been a man in advance of his time in regard to many of his professional ideas, and that in some cases, at all events, he has never received the full credit which was his due.

#### NOTES.

**T**HE Institute of Architects has issued its circular in regard to the proposed preliminary examination of students to qualify for registration as Probationers of the R.I.B.A., in pursuance of a scheme which we have before referred to, by which the Institute seeks to assist those who are intending to follow the profession of architecture in the earliest period of their studies, and to make a kind of selection of the fittest to enter the profession through the gates of the Institute Examination. The first examination "of architects' pupils or improvers, or of other gentlemen intending to follow the profession of architecture" will be held by the Institute of Architects in November of this year, and will embrace the following subjects:—

1. Writing from Dictation.
2. Short English Composition.
3. Arithmetic: Algebra to Simple Equations; the Elements of Plane and Solid Geometry.
4. Geography of Europe and History of the United Kingdom.
5. French, German, Italian, or Latin: one language to be selected.
6. Elementary Mechanics and Physics.
7. Geometrical Drawing or Elements of Perspective: one subject to be selected.
8. Freehand Drawing from the Round.

Those who have passed certain University and school examinations, which are defined in a further paragraph, will be exempted from examination in the first six subjects of the programme. Each one of those who pass the examination and is admitted as a Probationer will be qualified for registration as *Student R.I.B.A.*, and his name will be inserted in the calendar of the Institute as such. A "student" on passing the final examination to be passed by "students" who have attained the age of twenty-one years, will be qualified to become a candidate for associateship. The secretaries of the Institute will furnish any further particulars in reply to inquiries addressed to them at 9, Conduit-street, Hanover-square. The scheme appears to us to have the double advantage that those who have the requisite ability for the practice of the profession of architecture will be at an early period assisted and stimulated in a course of systematic study, and those who have no ability such as would give them a probability of success in the profession will be in the way of finding it out before it is too late. We hope many of the young men who are thinking of the profession of architecture will enter for this Probationary Examination, and that "Parents and Guardians" will encourage them so to do: we believe they will find the advantage of it in more ways than one.

**F**ROM an advance proof forwarded to us of a report on the condition and construction of the Connemagh dam, made by Mr. Brinckerhoff for the *Engineering and Building Record* of New York, we learn that, as we expected to find, the dam was an earthwork merely, and had not even the usual puddle wall in the centre, but this is explained on the ground that the whole mound

was formed of what was practically puddle. The direct cause of failure appears to have been subsidence in the centre from percolation of water into the dam, forming a weak point which the accumulated pressure from storm-water immediately found out. It also appears that what the Americans call the "spillway," the overflow channel at the side of the dam to provide for the rising of the water in storms, was too small for its work, and that had it been of larger section the catastrophe might have been much reduced in its effects, though on the other hand the torrent from the spillway itself would in that case have formed a source of danger and destruction. In fact, taking the circumstances as narrated, we doubt if any overflow would have saved the dam except one so large as to have amounted in itself to a dangerous flood. If it is true that the material of the dam was practically puddle, it does not appear that it was worse in its construction than other dams of the kind; and the lesson is, what we said at first, that earthworks cannot be depended on for reservoirs on a large scale. A very slight and slow percolation of water into such a dam is the beginning of a great and serious mischief, which may be progressing for some time unnoticed, and only become known, too late, when a storm brings the whole suddenly to a severe test.

**T**HE London County Council has, on more than one occasion, shown that its members hold very comprehensive views as to the extent of the functions it should exercise. The control of the electric lighting of London seems to this body too big a thing to be left in the hands of the Board of Trade and the various local authorities; but the local authorities are not disposed to have taken from them, without entering a vigorous protest, the decision of questions with which they consider they have the right to deal. At the meeting of the Paddington Vestry on Tuesday, June 18th, the letter of the London County Council of June 5th, to the Board of Trade, on the subject of the Electric Lighting Applications for the Session 1889, was considered in connexion with a report from the Paddington Electric Lighting Committee. In this letter, to which we have before had occasion to refer, the County Council suggests:—That no Vestry or District Board shall be allowed to purchase electricity from any company and retail it to consumers without first obtaining the sanction of the Council; that the powers to make subways, into which the companies shall be compelled to put their cables, should be vested in the Council; that provision should be made to prevent the opening of any thoroughfare in the County of London for the purpose of laying mains, &c., without the consent of the Council; that if the Council is made the controlling authority it shall be empowered to discharge the following duties, viz., "Inspection of lines and works," "Testing currents," "Testing and certifying meters," "Taking proceedings for imposition of penalties or forfeiture in cases of default as provided in the Orders." The Paddington Vestry has recorded its opposition to the letter of the Council by taking "the strongest exception to the proposals therein made for transferring the control and purchase of the electric lighting in the Metropolis from the City Corporation, the Vestries, and the District Boards to the County Council." Until the exact scope of the functions of the local authorities on the one hand, and of the London County Council on the other, has been more clearly defined than it is at present, this is but one of the many disputes that will arise in the near future. There are, unquestionably, many regulations that should apply equally to all electric lighting companies, not only in London but throughout the kingdom. Such things as the testing of currents, the testing of meters, &c., should be undertaken, if possible, by one central authority. To make electrical measurements with a fair degree of accuracy is easy

enough, but to make them with *absolute* accuracy requires not only costly and delicate apparatus, but an operator possessing no ordinary skill and technical knowledge. For example, the figures obtained from a measurement of the power conveyed by an alternating current will vary within certain limits according to the methods adopted. If, therefore, absolute accuracy is so difficult to obtain, the next best thing is absolute uniformity. A Board of Trade unit, as supplied and metered by a company, may or may not be exactly in accordance with the scientific definition given to it; but if it means the same thing all over London, the matter is by no means as serious as it would be if the unit charged for differed in value with the local authority in whose district it was supplied. This end is clearly best attained by placing measuring and standardising under the control of but one body. When, however, it is remembered how different will be the conditions of supply in different districts, surely such questions as the breaking up of roads, the retailing of electricity, &c., and special regulations ought to be considered by the local authorities, who must, or should, know most about local conditions and requirements. The question of the advisability of centralisation and decentralisation seems no nearer settlement than it has been hitherto. Electric lighting from large central stations is as yet unhampered by vested interests, and it is to be hoped that no hasty decisions will prevent the adoption of efficient means of control, equitable alike to the public and the companies, which are so sadly lacking in the cases of water and gas.

**I**T appears that the Board of Trade circular of June 10, referring to the objections to the new railway rates (see p. 442, *ante*), does not meet with the approval of some of the leading trade organisations which are dealing with this question. Lord Henniker's Railway Rates Committee and the Railway and Canal Traders' Association concur in the opinion that the step proposed by the Board of Trade is unwise; and they advise individual traders not to enter into negotiations with the companies unless they can secure competent advice and guidance. The former body, in a resolution passed at a recent meeting, urge that the settlement by the Board of Trade of all the questions of principle in dispute would tend to determine many of the details which, it is now proposed, shall be the subject of negotiation. The Railway and Canal Traders' Association have themselves lodged a very formidable list of objections, extending over eight pages, which, if they could be sustained, would render ineffectual many compromises which individual traders and the companies might arrive at,—particularly with regard to the details of the classification. For example, the Association objects to the classification *in toto*, "as it is inconsistent, and framed upon no recognisable principles." It is further contended that "no satisfactory basis of classification can be arrived at without a full inquiry into the cost of carriage of various descriptions of merchandise." Terminal charges are, of course, strongly objected to, and some forcible arguments are adduced in support of the position taken up by the Association on this point. There certainly does not seem much prospect of a speedy settlement of the question at present.

**I**T is not surprising that the Coroner's jury on the Armagh railway tragedy should have returned what amounts to a wholesale verdict of manslaughter all round against those who were directly concerned with the management of the train. The verdict will probably not be borne out in the same sense against all concerned, when the question of responsibility comes to be more fully considered at the trial; and it would of course be improper for any journal to anticipate justice by attempting to fix the real responsibility in advance. The whole history of the disaster reveals a degree of concentrated stupidity such as is rarely met with in connection with railway



management, and we may perhaps say, never in England; at least we can hardly imagine any railway guard on this side the Irish Channel giving an order to uncouple carriages on an incline before ascertaining that all brakes were on and every necessary means had been taken to ensure the holding up of the carriages on the slope. In regard to the question of the sufficiency of the engine, sufficient stress does not seem to have been laid on the fact that the driver had never gone over that part of the line before, according to the evidence. His opinion as to the sufficiency of the engine may therefore have been honestly given in ignorance of the nature of the gradients, and he may have been correct as to the powers of the engine on the assumption that there were no "banks" of any importance. On the other hand, it seems to say the least, a most rash and ill-advised thing to entrust the driving of an unusually heavy train to a driver who did not know the peculiarities of the road, considering especially what an immense difference even a very moderate gradient makes in the hauling power of a locomotive. When the opinion of the engine-driver was taken as to his having power enough, it was evidently forgotten that he was a driver who did not know the road, and that his opinion was therefore worth little or nothing. This was the first error of judgment, which might however have passed off without fatal consequences but for subsequent and more flagrant blunders, to call them by the mildest term.

THERE is no more useful work done by the judges than that of protecting shareholders against directors. Theoretically, directors of limited companies are the agents of the shareholders; in practice they are generally the shareholders' masters, and many directors seem to think that companies with which they are connected exist altogether for their benefit. In the case of *Eden & the Ridsdale Lamp and Lighting Company*, which has lately been decided by the Court of Appeal, the plaintiff, after the Company had been formed and the shares issued to the public, received as a gift from the vendor of the business of the Company 200 of his shares. The Court of Appeal decided that he had no right to receive them, and that the Company were entitled to recover their value from him. This decision will do something to protect shareholders against such action on the part of directors for the future. But there is no doubt that if shareholders would only take a little more trouble to look after the affairs of companies in which they have an interest they would not require, as they now often do, the protection of the Court.

THE editors of the "Monuments Grecs," published from time to time by the "Association pour l'Encouragement des Etudes Grecques," can certainly not be accused of any unseemly haste. Their last issue appeared in 1884, and now we have a single number, dated comprehensively 1885-1888. The Association set to work in 1872, and probably at that time Greek studies were badly in need of "encouragement" in France. This is no longer the case, and we are tempted to wish that a publication so tardy would merge its material in one of the many other French archaeological organs. However, though late, the new number is undoubtedly interesting. It is entirely devoted to Greek vases, and this is no matter of regret, as the Louvre collections, from one cause or another, contain more important unpublished vases than any other of the old European collections. M. Collignon has a paper on the Athenian cavalry as they appeared on vases, and he publishes a vase with this subject signed by Euphronios. M. Léon Heuzy writes on the somewhat mysterious heads and busts of women that appear on vases, and some of which, so far, lack a perfectly satisfactory interpretation. M. Pottier, who is always well worth reading on the matter of ceramics,

publishes a very interesting vase, decorated with scenes in relief from the myth of *Edipus*. These vases, with relief designs of this special set, come, for the most part, from Boeotia. The British Museum has an interesting specimen, depicting a scene also from the mythology of *Edipus*; the blind *Edipus* near the body of *Jocasta*. The Louvre cup represents an earlier scene, the "foundling child" received into the palace of *Polybos*. Its special interest is that it seems to follow the version,—probably a local one,—of *Hyginus*, not of *Sophocles*, as the mother is inscribed *Periboea*, not *Merope*.

THE long-looked-for plan of the Acropolis has at last appeared in the much-belated March number of the *Δελτίον*. It is not signed, but is we presume, as was promised, from the hand of Dr. Kaweran. It is accompanied as yet by no explanatory text, but to those who have followed with any care the course of the excavations (from 1885-1889) it speaks for itself. The position of such newly-discovered buildings as the "Old *Athene Temple*," the "House of *Erechtheion*," and the "Temple of *Roma*" is already well known by all archaeologists from previous plans. The great service that the new plan renders is that it makes clear at a single glance a subject far more complex, a subject difficult indeed to understand even on the spot,—i.e., the arrangement and superposition of the various fortification walls of the Acropolis, structures of "Pelasgian," pre-Persian, Cimonian, Periclean, and Roman date. The plan is given in four colours. Blue represents Pelasgian remains, and all polygonal masonry is clearly indicated by indented lines; yellow is kept for buildings actually modern—e.g., the museums; black, for work which is of the date of *Pericles*—e.g. *Propylea* and *Parthenon*. The use of the fourth tint is not so clear: it seems to indicate any building that will not come under one of these headings. The "Old *Athene Temple*" and *Beulé Gate* are both drawn in grey—this seems to be a great blot on the clearness of the whole. Next in interest to the wall structures will come the buildings in and about the precincts of *Artemis Brauronia*; the foundations of these are now made as clear as they probably ever will be. Unhappily there is no foundation which can with any show of probability be supposed to belong to a temple. Probably the goddess had only a sanctuary with colonnades.

WE are glad to see that the work in connexion with the restoration of the Church of *St. Mary-le-Strand* has been commenced, although the Rector, the Rev. L. Tugwell, states that upwards of 1,000*l.* is still required to make up the cost of the work. We welcome the commencement of this too-long deferred work because the dilapidated and woe-begone aspect of the church, and the unsightly hoarding which surrounds it, have been glibly spoken of and gleefully pointed at by the advocates of the removal of the building. When the church is restored and the hoarding removed, the would-be Vandals will be deprived of two of what they deem to be their strongest arguments against the retention of the church. Since these words were written, indeed, we see that a letter has appeared from the "Strand Highway Improvement Association" almost admitting as much. When the hoarding on the south side of the church is removed, it will be found that the width of that part of the Strand will compare very favourably indeed with its width in other parts, and it will then, we venture to say, be evident to the meanest capacity (outside a Fleet-street newspaper office) that there is no need to remove the church in order to make room for the traffic of the Strand.

THE Sub-Dean of the Chapels-Royal asks in the *Standard* for contributions,—by way, we presume, of either history or fact,—to his projected account of *St. James's Palace*. In our columns of Oct. 22, 1887, we gave a brief outline of the story of King Henry

VIII's "Manor House." Having since had occasion to investigate the provenance of the "warming-pan plot," we compared some plans and views of the buildings with a survey annexed to "A Full Answer to the Depositions . . . Concerning the Birth of the Prince of Wales. The Intreague thereof Detected," &c., &c. London: 1689. Readers of Macaulay and Howell's *State Trials* will recollect how, in October, 1688, the King felt it necessary to produce before his Privy Council proofs of a birth which was stubbornly denied by the ultra Church of England party. The plan referred to is of signal topographical value, inasmuch as we clearly see therein the positions of certain portions of the precincts that have yielded to later changes. The following, for example, are thus indicated by name: the dormitories and entrance to the convent; the cloisters, with grass-plot and Friary garden, whose easy Capuchins kindled *Pepys's* envy; the chappell (*Queen Katharine of Braganza's*); a burying-place (lying eastwards of the first court next "Pell Meil," and the Protestant Chappell, the existing Chapel Royal. A dotted line delineates the route along which, as alleged, the infant was conveyed by the Jesuits from beyond the cloisters, at the north-eastern corner, to the "Queen's great bed-chamber," wherein are marked the "Bed" and its "Ruel" in the south-western angle of the palace, adjoining to the "King's Lodgings" in this the southern front. Each of these two sets of apartments has a set of "back stairs," which are approached through the "Iron Gate" from the "Great yard next *St. James's Park*." Most of this yard, together with the adjoining friars' garden, is now included within the grounds of *Marlborough House*.

WE have before us some particulars of a proposal of M. Ritter to supply the City of Paris with water from *Lake Neuchâtel*. It is not the first time that a project of this kind has been brought forward. M. Beau de Rochas proposed to provide the French Metropolis from the Lake of Geneva. It is claimed for M. Ritter's scheme that it is more simple and perhaps less costly. Besides having all the advantages of an ordinary supply, these high-level projects intend to give motive power for electric lighting, &c. The surface of *Lake Neuchâtel* has an area of 350 square kilometres, and supposing, in consequence of drought, it did not receive a drop of water from the numerous rivulets which spasmodically pour into it, or from any other source, it is estimated that a stratum of one metre in depth extending over the whole lake would still suffice to supply the city for two years. Such a contingency is not very likely to arise; but it gives some idea of the resources of the lake. It is possible, without appreciably lowering the level of the lake, to give each Parisian 600 litres of water per twenty-four hours. When the population of the city shall have attained as much as five millions, they would still receive about 350 litres per head of good, fresh water. The water would be taken at a depth of 80 metres from the surface of the lake, at a height of 425 metres above sea-level, and would run towards Paris at the rate of 30 cubic metres per second. Immediately on leaving the lake it would pass through a tunnel 35 kilometres in length, pierced through the Jura, coming out in the valley of the *Deaoubre*, near *Blanchefontaine*; thence it would be conveyed in an aqueduct partly underground and partly on hill-sides, to the city. Supposing it arrived in the vicinity of Paris at an altitude of 120 metres, it would be 305 metres lower than at the place of intake, and the gradient for the whole route (500 kilometres) would be 6 in 1,000. The Geneva scheme only provides an inclination of 4 in 1,000. M. Ritter says that his scheme would cost not more than 300 million francs, whilst the Geneva lake project was estimated at 500 million francs. The work could be finished in six years from the commencement. We wish M. Ritter all success, but his project appears to be rather too high-sounding, and,



unless we are mistaken, Parisians will not care to depend for their water on a source so distant, and in a foreign land, especially when the higher ground in their own country could be made to minister to all their wants in this respect—save, perhaps, the motive power alluded to. This latter, however, in view of the easily-obtainable and cheap distribution of hydraulic power from many other sources, may be regarded as a secondary matter.

THE collection of portraits of architects exhibited in one of the rooms in the École des Beaux-Arts during the time of the Conference of Architects at Paris, was of considerable interest, and included a number of old engraved portraits of the Italian architects of the Renaissance. The French architects of the last generation, many of whom have left reputations which will not soon be forgotten, were also largely represented in the collection. English architects, we observed with certain feelings, were very sparsely represented, the names of Inigo Jones, Sir Charles Barry, and Owen Jones making up the whole English list. We might have hoped to have seen Wren, at any rate, if not Scott and Street. Among other distinguished names whose effigies were to be seen were Alberti, Arnolfo di Lapo, Bernini, Bramante, Delorme, Erwin von Steinbach, Ghiberti, Le Nostre, Le Pautre (given in the old spelling—neither of these were properly architects, however), Mansart, Michelangelo, Palladio, Perrault, Raphael, San Gallo, Sansovino, Scamozzi, Schinkel, Soufflot, Vignola, and Viollet-le-Duc: a series of names rather calculated to fire the mind of the ambitious young architect of the day, seeing what a crowd of associations in connexion with the romance building hangs about them.

AN influential meeting was held in Edinburgh, last week, to consider the question of holding an Electrical, Engineering, and Mechanical Exhibition in that city next year. It is thought that the opening of the Forth Bridge will form an element favourable to the success of such an undertaking. It was remitted to a committee to carry out the Exhibition scheme, and report progress to a future meeting of the General Committee. Negotiations are on foot for the procuring of a site in the immediate proximity of the railways to the west of the city, at Gorgie. Though somewhat distant from the city, the site possesses advantages in respect of the delivery of heavy exhibits directly from the railway. Another advantage it possesses is that of ample space for outdoor exhibits—electrical railways, tramways, and wind and water power necessary to illustrate the different applications of electricity. Another site talked of was one across the Dean Bridge, on the Queensferry-road, which, although it might not have all the advantages above referred to, had others which might probably counterbalance them.

WE have received the first number of the *Decorative Vorbilder*, a monthly publication of motifs for decoration; with an announcement from the English agents for the sale of the book that "should the English press notice this part favourably," they will shortly issue a special edition with the titles printed in English. We fear the publishers are not likely to find in this country the encouragement they hope for. The Germans are probably the worst decorators at present, in regard to perception of what decorative treatment means, of any nation in Europe, and the present work is fully representative in that way. The only page in it that would appear passable in the eyes of English decorative artists would be that of the "Vignetten" of scroll-work in black and white, and we have much better models of this kind of work accessible in England. Of the other designs the less said the better. They may do in Germany.

\* Julius Hoffmann: Stuttgart.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—IX.

1985. "Christ Church Cathedral, Oxford": Mr. Cecil B. Roper. An ink-drawn interior in the same style as No. 1952, on which we before remarked. The peculiar spottiness of handling is, however, a little overdone here.

1987. "New Roman Catholic Church, Folkestone": Mr. Leonard Stokes. This very characteristic exterior of a small church we illustrated in the *Builder* for June 1 of this year. The deeply-played and moulded window between the square masses of plain masonry acting as angle features, gives a largeness of effect to what is only a small church. We do not quite like the small pieces of buttress stuck against the lower story of these angle-turrets; they seem to want tying-in to the composition.

1988. "Design for East Window, St. Andrew's Church, Clevedon, Somerset": Mr. C. Hardgrave. A window treated with a large amount of architectural framework of late Gothic type, forming in each division a framework to the figures of Apostles in the principal lights; other figures similarly framed appear in the subordinate lights. Four small spandrels are ingeniously filled in with winged emblems of the Apostles. The style of the glass is later than that of the window tracery, which is of no great consequence however; the treatment of the architectural detail is good and fills up the spaces well, and the figures are designed with a certain degree of stiffness and perpendicular line in the drapery which harmonises them well with the whole: the colouring is rich and effective also.

1989. "Gatehouse at Warnham Court, Hordsham": Mr. A. C. Blomfield. A pencil drawing of a pretty gatehouse with a circular-arched entrance between two wings with stepped and curved gables; under each gable a pedimented niche with a statue is picturesquely worked in as a pier between two windows; the weak point of the design is in the lean-to bays on the ground-story, which do not harmonise with the character of the building and look rather commonplace.

1990. "Cottages and Stables, Banstead": Mr. Herbert D. Appleton. A pen drawing of a picturesque group of cottages, of which an illustration will be found in the *Builder* for October 27, 1888.

1991. "The 'Angel Tower,' Canterbury Cathedral": Mr. H. Wilson. Apparently a good sketch, but not easily seen where it is hung. The illusion of upward spreading of the vertical lines of the tower is curiously seen in this drawing, probably owing to the arrangement of the sky and its decidedly-marked oblique lines, and the upper part of the tower being light against the darker portion of the sky.

1994. "An Old House-front at Rouen": Mr. Arnold B. Mitchell. A drawing, reproduced in the *Builder* of Feb. 19, 1887, and a very pretty one, but incorrect, as we discovered afterwards, in showing the middle pier of the first story the same width as the side ones, whereas it is really a good deal narrower; an incident which has a good deal of effect on the character of the front.

1995. "Fotheringay Church": Mr. Raffles Davison: a slight but very agreeable pen-sketch of the well-known tower and lantern.

1996. "Eton College": Mr. R. Phené Spiers; a good architectural water-colour showing a gateway and part of one of the quadrangles.

1997. "Mansion at Rondebosch, Cape Town": Mr. James Brooks. This is an interesting pen-drawing, finished with much care, of a large house, of which a plan is added, in which it seems to have been the object to reproduce in the Cape Town climate and surroundings the main characteristics of an English domestic Gothic house. We should have thought the mullioned windows rather large in area for a hot climate. A certain degree of special character is given by the verandah, carried on turned wooden pillars, which runs round the ground story. The plan seems a very good one, but the house has hardly the degree of character we should have expected from the author and under the suggestive circumstances of the site.

1999. "Hanover New Schools, Gilbert-street, Grosvenor-square": Mr. W. D. Caröe. A rather heavily-worked but not ineffective pen drawing, which seems to be an inspiration from the London Board School style; treated with some character, but rather heavy. The only relief to the general squareness of line is in the canted angles of the upper stories of the wing on the right of the drawing, and the plan in the corner,

of ground floor only, shows nothing to account for this treatment at this point.

2000. "Design for East Window, St. Leonard's Church, Tortworth, Gloucestershire": Mr. C. Hardgrave. This, by the same artist as 1988, is also a very well-designed window in point of style and colour, showing a true feeling for the proper characteristics of stained-glass design; rich colouring, perfectly flat treatment of the composition, and good decorative effect in the accessories.

2008. "Proposed Convalescent Home for Ladies, Bognor, Sussex": Mr. Hilton Nash. This is too high to see the small plan added in the corner. The coloured geometrical elevation shows a picturesque combination of red brick and timber and plaster work, perhaps with a little too much appearance of striving after the picturesque.

2005. "A House at Sudbury": Mr. James S. Gibson. A pleasing example of a quiet picturesque country house of the "cottage" type, in which the most important features are elliptical bay windows (elliptical on plan) running the whole height of the wall and acting as apparent supports to widely-projecting eaves. After a manner much practised now from old examples, but which has a picturesque charm of which one does not easily tire.

2006. "Stables at Otford, Kent": Messrs. Roger Smith and Gale. This is a very good, clear, bright pen drawing, showing a group of stable buildings with the centre portion treated as an architectural design of some importance, with black-and-white work and a kind of open loggia in part of the ground story. The meaning of this, however, and the function of the small one-story buildings on each side, is not apparent in the absence of a plan. These lower buildings, at all events from the point of view taken in the drawing, rather interfere with the effect of the whole.

2007. "Compartment of Vaulted Ceiling, Appartamento Borgia, Vatican: painted by Pinturicchio": Mr. Gerald C. Horsley. "What is the good of copying that?" we heard a spectator ask. Well, the good is that a remarkable piece of decorative work is brought to the knowledge of people who have not been to see it, and perhaps cannot conveniently go; and it is interesting as a remarkably able piece of copying; and possibly the artist found it very good practice for himself. So there are three good reasons for the carping spectator. The drawing shows broad flat radiating vaulting ribs treated with an interlaced gilt ornament curiously Celtic-looking in character; the interspaces deep blue with a diaper pattern in thin gold lines; in the centre of the compartment is a built-up quasi-Classical throne or shrine with a crowned figure seated on it, and another standing on a head placed on the apex of the gable; the whole might have come out of the "Porphyrion" volume, or some such work. The figures on each side are inexplicable; on one side are two youths reaching to pluck apples from a tree of which the leaves show a faint green against blue ground; on the other side is a reverend-looking gowned figure with two similar youths; on the shrine in the centre are the words

LEGERE POMA A  
B ARBORIBUS DO  
CVIT.

in a panel. The whole is a curious piece of what may be called Renaissance mysticism.

2008. "Portion of Mosaic of King Roger Crowned by Christ, La Martorana, Palermo": same artist. A large very careful copy of a stiff mosaic crowned and draped figure, painted with the gold as well as the colours realistically imitated, and every cube of the mosaic shown, but whether professing to be an exact reproduction of the original in respect of jointing also we cannot say.

2009. Compartment of Ceiling, same title as 2007, and same artist. This is of much less interest than 2007, nor would any one for a moment suspect, from internal evidence, that it was painted by the same artist or belonged to the same date. It shows a triangular panel with a circular medallion in the centre with a half-length figure of Solomon painted in it, there are three subordinate triangular panels with flower ornaments on a gold ground, and the surface between is painted with animals and garlands and tripods in what may be called the *thin* Renaissance ornament style, in gold on a very dark blue ground. We presume Mr. Horsley has satisfied himself that these two are really by the same painter; the more we look at them, the more impossible it



seems. Visitors to the Academy have to thank him, at all events, for three very interesting and careful illustrative drawings.

2010. "Halifax Cathedral, Nova Scotia"; Mr. Arthur E. Street. These were published in the *Builder* for May 18 of this year. The exhibit consists of a sheet of plans and geometrical elevations simply. The plan shows a three-aisled church with a shallow square-ended chancel with vestries beyond it, kept of course low, and a triplet lancet window over. On the south side of the nave is a rather peculiarly arranged morning chapel cutting out part of the south aisle, and with an east window on one side of its central axis with a borrowed light from the aisle on plan; the west elevation, however, shows that it has large central windows in the gable above. The western apse in the chapel, which makes a pretty feature externally, is, we presume, intended as a baptistery. The church is designed in an exceedingly solid and simple Early English style, with geometrical tracery of a simple type introduced here and there; the nave and aisles are timber-roofed, the chancel vaulted. The longitudinal section shows a good effect obtained by the plain mass of solid wall of the morning chapel, with the south arcade abutting against the end of it. The whole is a very satisfactory example of the style of the mother country transferred to a colony.

2011. "Upholland Church, near Wigan"; Mr. Basil Champneys. This we illustrated in the *Builder* for December 15 of last year. It is a view of the east end of a church with a richly-traced tracered window of Late Decorated style, and advantage is taken of the fall of the ground to get a vestry beneath the chancel, which is entered by two square-headed doors in the east end, the plinth upper moulding stepped a little way up to form a label for them and for the square-headed window between which lights the vestry. This is ingenious and characteristic; we do not quite like the two small buttresses under the east window, cut off short below the string-course; they look planted on; they would have been better carried up to the window sill and finished with gablet heads. Plans of the chancel above and below are shown.

2012. "Burford Church, Tenbury"; Chancel as restored"; Mr. Aston Webb. A pencil drawing, hastily executed in some parts, but very effectively touched in the portions which it was specially designed to show. A small sketch in the corner shows the chancel as it was, with a thinly-framed gable roof open timber roof with low collar-beams and celled at the true collar-beam level. For this has been substituted a semicircular wagon-ceiling richly decorated with foliated panelling, and with figures of angels over the piers at the springing, gracefully following the curve of the roof. The windows have been filled with good tracery, and an effectively-designed reredos put beneath the east window, while a neglected monument with a recumbent figure has been brought out to the centre of the chancel. A comparison of the work done with the previous state of the chancel shows a very satisfactory piece of restoration, which has resulted in giving richness and beauty to a formerly bare and mean chancel.

Here we conclude our notes on the architectural drawings of this year's Academy, which exhibit a great variety of work, though not including more than a very few drawings which can be considered of the highest order of interest.

**The Hellenic Society.**—The annual meeting of the Society for the Promotion of Hellenic Studies was held on Monday afternoon. Professor Jebb presided, and among those present there were Mr. Watkins Lloyd, Dr. Hubert Holden, Mr. J. B. Martin, Mr. Walter Leaf, Professor Ridgeway, Mr. Talfourd Ely, Mr. J. T. Bent, Professor Butler, Professor Baldwin Brown, Mr. George A. Macmillan, the hon. secretary, &c. Mr. Macmillan read the tenth annual report, and the Chairman, in giving a survey of Hellenic studies during the past year, referred to the most recent discoveries and researches in the field of Greek archaeology, particulars of which have appeared in our columns from time to time. Mr. A. E. Gardner, the Director of the British School at Athens, then gave an interesting account of archaeological work in Greece during the past season. The report was approved, and officers having been elected, votes of thanks to the auditors and the chairman were passed, and the meeting terminated.

#### THE INTERNATIONAL CONGRESS OF ARCHITECTS.

THE third International Congress of Architects was opened in Paris on Monday, the 17th inst., in the Conference Hall of the Trocadéro Palace, the two previous ones having been held in connexion with the two last International Exhibitions in Paris,—that of 1867 on the Champ de Mars, and that of 1878 at the Trocadéro, when this palace was added, and became a permanent centre for various movements in connexion with Architecture and the Fine Arts in France. In preparation for the event the Central Society of French Architects took the initiative at an early period, as they had done at the two previous Exhibitions, and a strong committee was formed, of which M. Bailly (Member of the Institute of France) became President, and the following, among other leading French architects, members:—MM. Charles Garnier, Hermant, de Joly, Wallon, Ch. Lucas, Hardy, de Baudot, Paul Sédille, &c. This committee invited and received the co-operation of the Presidents of the chief architectural and artistic societies in France, England, Germany, the United States, and several other countries, the British representatives including Sir Richard Wallace, Sir F. Leighton, Mr. Waterhouse, R.A., Professor Aitchison, Mr. Penrose, Mr. R. P. Spiers, Mr. Appleton, Mr. H. H. Statham, Mr. C. Barry, Mr. C. Purdon Clarke, Mr. W. H. White, &c. Several Governments were represented by delegates officially appointed.

The opening proceedings, which took place in the afternoon of Monday, consisted of the appointment by the Congress of its officers, M. Bailly (President of the Central Society) being appointed President, and M. Charles Garnier Vice-President, by acclamation. The following gentlemen were added to the list of Vice-Presidents:—For France, MM. Daumet, Normand, Hermant, Guillaumet; for England, R. Phéne Spiers; H. D. Appleton; United States, B. Morris Hunt; Germany, Leniman; and Portugal, Da Silva. MM. Charles Lucas and Eugène Müntz, secretaries of the Committee of Organisation, were made the secretaries of the Congress, with the addition of MM. Bartamieux, Loviot, Roux, and Gaston Trélat, and for Germany, M. Bendemann.

The President having welcomed the members, French and foreign, for their ready and hearty co-operation in the work, and declared the third Congress open, M. Charles Lucas gave a report of the proceedings of the committee of organisation during the eleven months of its existence, the steps taken to convoke the most representative gathering that was possible, of both French and foreign members, to prepare a preliminary programme, and to organise an exhibition of portraits of architects at the Ecole des Beaux-Arts. He regretted that the attempts which had been made to procure from the railway companies a reduction of fares in favour of the members of the Congresses to be held during the Exhibition had so far been unsuccessful, and that the members of that Congress had therefore not had the advantage of the expected reduction. Including twenty-five foreign adherents and twenty foreign societies, the Congress had received the support of 247 members and subscribers, and a sum of 10,600*fr.* had been furnished towards the expenses of the Congress. The modifications made in the programme by the absence of M. Gustave Eiffel, who was expected to give the first lecture and certain circumstances which necessitated the change of date of the banquet from the 22nd to the 21st, and prevented the projected excursion to the palace of Chantilly, were described, and references were made to the absence of several members who had intended to be present at the Congress, included among these being their eminent English colleague, Mr. Penrose, whose absence was unfortunately due to illness. The modified programme of the sittings and visits was explained, and the speakers who would read papers, so far as they had been fixed, were named.

The report was adopted, *nem. con.*

The first subject to be treated was "The teaching of Architecture in France and Abroad—its present situation, and the reforms to be introduced into it," and at the close of the formal business of the Congress, Monsieur de Baudot was called upon to deliver a lecture on the subject. M. de Baudot's paper, which was listened to throughout with great interest, and was warmly applauded at its close, commenced by declaring his conviction that he was undertaking

a delicate, and perhaps painful, task in putting forward views which were contrary to those of a great number of his colleagues. He was not the first to commence the combat which had been going on with more or less vigour for the past fifty years. The contribution to the discussion he proposed to give was not intended to be regarded as a solution of the questions in dispute, but was presented for the purpose of provoking discussion.

The first point to be decided was whether reform was wanted or not, and he welcomed the presence of so many foreign members in the Congress, because their co-operation in the solution of the question would be of the highest value. He contended that modern architecture had no aesthetic character of its own, and that the discovery of a new art in architecture had become necessary on account of the rapid march of modern science. The scientific character of modern science, which the modern curriculum had assumed necessitated extensive changes in the teaching programme. A Greek original, or an example of the architecture of the French middle age, did not respond to modern utilitarian ideas. To present for imitation the style of Louis XV. was irrational, and to-day a rectification of the programme of studies was a necessity. During forty years the National Institution had done excellent work, and its system was far superior to the system which preceded it, but it was no longer sufficient. New efforts must be made. The artistic in architecture was too much divorced from the scientific. Present methods tended to produce, in the second place a scientific work, and in the first place only a water-colour drawing. While they continued in this direction the architect ran a great risk of being outstripped by the engineer. The importance of the engineer was rising, that of the architect falling in estimation. A change of method was imperative in the interest of the architect himself, in order to safeguard his position and to maintain the dignity of the profession.

The admirable Exhibition they had created on the Champ de Mars was the best possible illustration of the tendency of our age to magnify the importance of the engineer. The buildings presented many points for consideration which came within the domain of art, but it was not art. Almost everywhere they found skeletons created by the engineer and decorated by the architect, who was thus reduced to play the rôle of a co-operator in the work, in place of being the creator and director. The architect believed too much in the ornamentation of past epochs, and did not sufficiently consider the question of a form of ornamentation which should be the logical outcome of the improvements of the age, and should be based on the rational employment of the materials that now existed. The young architect appeared to have no belief in the possibility of evolving a new contemporary architecture. That was because his education was defective and his instruction was insufficient.

He attributed the fault to the present mode of teaching architecture under academical direction in the Ecole des Beaux-Arts. In science was taught independently of art. In the examinations, account was not taken of excellence in ideas of construction. Only good drawing was rewarded, and studies of a scientific nature based upon scientific and philosophical considerations remained unregarded. The philosophical side of art was neglected, and the social, economic, and administrative conditions which the young architect was called upon to satisfy were not sufficiently considered in the present curriculum. The student was, in short, only taught to become an artist, and was not encouraged to become an adept in the art of composition. Only the forms of antiquity were placed before the student; the study of the models of the Middle Ages were either neglected or were considered by epochs without comparison between epoch and epoch.—In short, no analysis was encouraged or exacted.

In concluding his paper, the lecturer declared that an architect should know everything, and he indicated generally the nature of the improvements which he considered necessary in the programme of studies for architectural students. He demanded a superior school, in which the object should be the transformation of the art rather than the formation of artists. Such a school should not give a monopoly of training to students in Paris, but should be extended to the provinces. He claimed, in fact, that the principle of decentralisation should be



applied to the teaching of architecture, in favour of the provinces, where it had been hitherto impossible to obtain suitable special instruction. He demanded that the scientific and the artistic sides of the art should be studied simultaneously; that a logical programme should be laid down, that students should be compelled to study composition, and give proofs of knowledge of this branch of the art from time to time in each stage. M. de Baudot demanded, finally, a logical study of the entire past, in order that the modern architect might be imbued at once with the spirit of grace from the architecture of Greece, grandeur from that of Rome, and ingenuity of combination from that of the Middle Ages. There should be an increase in the number of professors, and at the same time a diminution in the number of subjects of examination, the examinations themselves being more than under the existing system directed to the application of the knowledge acquired. The following propositions were, in conclusion, formulated by the lecturer:—

1. To introduce reforms in the teaching of architecture.

2. To limit the number of students at the National School of Art (École des Beaux-Arts) to those who showed the highest proficiency.

3. To encourage schools of a preparatory character (*de second ordre*) in Paris and the departments.

4. To base the examinations in architectural composition upon scientific knowledge and upon a logical study of the programmes.

5. To develop a knowledge of various styles, those of antiquity as well as those of the Middle Ages.

A discussion arose, in which Mons. Émile Trélat and other members took part, upon the order of discussion of the points arising out of the paper, which was described by the last-named authority as "a very seriously-composed study." M. Ch. Garnier pointed out that as several speakers would claim the right to support or oppose the proposition, it would be difficult to properly consider the important propositions with which the paper concluded before the end of the proceedings. After some discussion it was decided to take a vote upon the conclusions proposed by M. de Baudot at the Thursday's sitting of the Congress.

The first sitting then closed, the members being invited afterwards to inspect the scaffolding put up for the purpose of repairing the roof of the grand Festival Hall of the Trocadéro by Mons. Bourdais, the architect of the Trocadéro Palace.

The second sitting of the Congress, which commenced at 3 p.m. on Tuesday, the 18th, in the Hemicycle of the École des Beaux-Arts, after a collective visit by the members to the exhibition of portraits of architects hung in one of the salons, was presided over by Monsieur Charles Garnier. Papers were presented on the question of a "Compulsory Diploma for Architects," by M. M. Chevallier and Courtois.

M. Chevallier's paper, which was read by M. Jourdan, in the unavoidable absence of the author, commenced by declaring that the necessity of possessing special educational acquirements before exercising the profession of architect was a primary truth. Leaving the question of the programme of studies to be settled by the experts, the author of the paper accepted that of the École des Beaux-Arts of Paris as sound. It had hitherto been optional to follow the course of study prescribed or not, and, consequently, by the side of competent architects men were found having little or no professional education, who profaned the art, lowered the dignity of the profession, constructed badly, and mis-employed the money of their clients. The diploma, which he regarded as an absolute necessity, to have any real value should only be conferred by the national authority, *i.e.*, the Government. The compulsory diploma might be made immediately available by means of a law similar to that which controlled the practice of medicine. The proposed diploma would not be retrospective.

In order that such a project should have a chance of successfully passing the ordeal of Parliamentary discussion, it must have the sanction and support of the masters of the profession. But since, at the headquarters of the art, the jealous guardian of the dignity of the profession must do nothing in undue haste, it is, above all, necessary for the great body of architects to prove that the project under their patronage will satisfy a real want, prove profit-

able to the art and those who practise it, as well as to the public.

The lecturer passed in review the different objections offered by opponents, and replied to them. It was objected that since conceptions could not be measured, no examination was possible, and, therefore, no diploma possible in an affair so completely one of imagination as architecture. His reply was that, since the examination existed at the École des Beaux-Arts, the diploma was at least experimentally possible.

The objection that a diploma would stereotype the teaching and destroy individuality in pupils was met by the fact that the victors in the competition for the "Grand Prix de Rome" had never lost their individuality in spite of the homogeneity of their studies. Those architects who had already succeeded without diploma naturally considered it unnecessary, and there were always to be found persons who opposed all reforms, believing that everything was for the best in the best of all possible worlds. To such objectors it was difficult to reply seriously, but to those who feared that between the old conditions and the new somebody would suffer, it might be replied that the compulsory diploma could not possibly weaken the position of architects in practice, but that, on the contrary, it would strengthen it, because, instead of the unlimited number of persons who may assume the position of architect, if they choose, under the present *lax régime*, the admission would be limited not to those who fancied the position, but to that much smaller number of persons who from among these had proved by their acquirements that they merited the position. It would appear that all who had, under actual conditions, conquered a position by their merits (and none more than the holders of the "Prix de Rome," who must always sail over the heads of the ordinary certificated architect), should be glad to have as colleagues men whom they could take by the hand and esteem as architects who, by proved capacity, had made themselves worthy to bear the title.

The conclusion of the paper declared necessary the compulsory certificate or diploma for architects for the following, among other reasons:—That the free exercise of the profession of architect in France has degenerated into licence; that persons unworthy of the title of architect are prostituting the art, compromising the dignity of the profession; even endangering the lives of the public, and that they are consequently an element of danger. Since the fact of a certificate becoming compulsory would infallibly lead to the constitution of bodies of architects where each member would possess at least the minimum of architectural knowledge; such bodies and the members belonging to them would afford the public guarantees of competency, which the title of architect, too often usurped under existing rules, does not afford. For these reasons the International Congress was called upon to affirm the following resolutions, which had already received the sanction of three previous national congresses, namely, those of Nice, Hyères, and Toulouse:—

1. "That, from a date to be fixed as early as possible, no person in France shall be allowed to exercise the profession of architect if he is not provided with a diploma, delivered by the Government, certifying to his possession of the minimum of knowledge necessary to the profession of architect."

2. "That the position of existing architects, at the time when the compulsory diploma may come into force, shall be completely respected."

After a few observations on the same subject from another member, it was resolved to vote upon the two propositions submitted at the proper time, towards the close of the Congress.

A paper was then given by M. Paul Gout on the subject of the proposals for a reform in the methods of teaching architecture. The speaker warmly espoused the views of M. de Baudot, which he developed effectively and skilfully. He joined in the condemnation of the methods of instruction followed at the École des Beaux-Arts, and declared that he knew of no better method of instruction than that adopted at the Trocadéro, in the classes conducted by M. de Baudot.

The President, M. Ch. Garnier, warmly thanked the speaker for his interesting communication, and invited him to formulate his conclusions, in order that they might be submitted to the vote at the sitting of the Con-

gress on Thursday. The conclusions were the following:—

1. It is desirable to modify the basis, and, therefore, the development, of the methods of teaching architecture, which is at present limited to the application of conventional forms and to the technicalities of construction.

2. For the existing mode of teaching, there should be substituted a system opening out a vaster field to the independence of the artistic genius of the nation, the proposed system consisting of the organisation, at the École des Beaux-Arts itself, of didactic instruction based on the analytic study of the methods of composition upon which the varied manifestations of the architectural art through every epoch have proceeded.

M. Ch. Lucas, the secretary, having explained the order of proceedings for the remaining sittings of the Congress and the dates of the proposed visits to the Grand Staircase of the Louvre, under the conduct of M. E. Guillaume, to the new Sorbonne, and the new Lycée Molière at Passy, an album of designs of Norwegian dwellings, formed of wood, and detachable in pieces convenient for exportation, was described and laid on the table for inspection by the members of the Congress. The album, which was presented to the Congress by M. M. Tanz & Co., of Trondheim, Norway, was examined by several members. The proceedings were then adjourned for the visit to the Louvre.

The morning sitting of the third day of the Congress, which commenced at 9 a.m., in one of the minor halls at the École des Beaux-Arts, was again presided over by M. Charles Garnier. There were on the dais, in addition to the secretaries and several French vice-presidents:—Mr. R. Phénix Spiers (Member of Council, R.Inst.B.A.), representing the Art School of the Royal Academy; Mr. H. D. Appleton (Pres. Architect. Association, London), and M. E. Guillaume (Professor of Architecture at the École des Beaux-Arts), the latter attending for the purpose of replying to the criticisms offered by M. de Baudot and M. Paul Gout, on the question of a reform in the methods of teaching architecture.

M. Lucas having submitted the minutes of the preceding sitting, announced the arrival of Mr. W. H. White (Secretary of the Royal Institute of British Architects) to represent the Royal Institute at the Congress, and the expected arrival, on the following day, of the President of the Royal Institute, Mr. Waterhouse, R.A.

M. Guillaume claimed to have a title to reply to the attack which had been made upon the system of instruction pursued at the École des Beaux-Arts, on the ground of his twenty-six years' connexion with it, as student, and subsequently as professor, of architecture. He described the course of instruction adopted, and the tests demanded from students in the various stages, explaining some of the changes and improvements introduced during the past twenty-five years, and appealed to the President (M. Ch. Garnier), a victor in the Grand Prix de Rome, and to the three architects charged with the grandest constructions of the Exhibition, who had all been pupils at the École des Beaux-Arts, as proofs of the efficient character of the instruction given (cheers). The basis of the instruction was laid in accordance with the principles of the exhaustive programme laid down by Vitruvius, which, if followed out faithfully, would produce architects worthy of being esteemed masters in every faculty. According to this, the architect must be an adept in geometry, and in arithmetical, mathematical, and astronomical science; have a good knowledge of music, and of the art of healing,\* and be a master of rhetoric and languages, of history and of philosophy, as well as an artist and a master of construction, to be a perfect architect (great applause). These fundamental principles had been applied to the elaboration of programmes which varied with the varying exigencies of the times. The list of subjects for study and examination which was given, he maintained, was appropriate to the necessities imposed by modern conditions, the architecture of all periods, that of Louis XIV. equally with that of the age of Augustus and of Pericles, being taught to the students. They were taught simultaneously the arts of architecture, painting, and sculpture as well as

\* Perhaps Vitruvius's real meaning would be better expressed to modern ears by substituting the word "sanitation,"—Ed.



literature, chemistry, physics, and the laws relating to buildings. In short, the course of instruction might not be perfect, but it was entirely unjust to say that it did not progress with the progress of contemporary art and science. The opposite was the fact. The progress in the École des Beaux-Arts had been incessant (cheers). Every epoch had its own characteristics. The constructions of 1789 differed totally from those of 1830, and the latter period had but little in common with our own time. Their dear friend, the Chairman (M. Ch. Garnier), and many others who had created some of the finest monuments existing in France, had been students of the École des Beaux-Arts. He had given them the *Nouvel Opéra*, but he would not pretend that he had founded a new style, although it afforded lessons to all who would study it, and he himself had gained much valuable instruction from it. In proof that the École des Beaux-Arts had at all periods given instruction of a kind to foster and not kill originality, he would invoke the names of Blouet, Gilbert, Duc, Abadie, Baltard, Félix Thomas, and Davoud, to speak only of the dead (applause). It had been claimed that they should aim at creating a new art. That was a thing which could not be done by one man, or any one set of men. A new style was the outcome of circumstances working through many generations. What they had to do was to give an instruction based on sound general principles, leaving it to the accumulation of individual and collective genius to supply it to the solution of the problems of each successive age as they arose (cheers). The only change he would propose in the programme was the substitution of the subject of Hygiene, as applied to habitations, for that of Descriptive Geometry. The lecturer was greeted with loud applause at the close of his address.

The President, after some remarks from M. de Baudot protesting against the personal tone which had been imported into the discussion, said the question was one of principle, and ought to be placed on a basis absolutely impersonal.

A discussion then arose upon the question of the day and hour to be fixed for the vote upon the conclusion of M. de Baudot's paper, the President and M. Charles Lucas, the secretary, contending for the maintenance of the order of the day as printed, and M. Guillaume and M. de Baudot endeavouring to obtain the most favourable time for their own supporters for the vote. Eventually Wednesday afternoon, at four, was fixed upon for voting on the subject, and the proceedings were adjourned for luncheon.

We will give further notes of the Congress next week.

**Glasgow Architectural Association.**—On Saturday last, the second joint-visit this season of the Glasgow Architectural Association and the Edinburgh Association was made to several places of architectural interest. Dalzell House was first visited, Mr. Hardie, Lord Hamilton's factor, conducting the party. Portions of this building date as early as the fourteenth century, while additions have been made so recently as 1867. In the gardens are some interesting sun-dials, and within much excellent woodwork and a valuable collection of armour, chiefly Scottish. The party then walked over to Hamilton Palace, and were shown over the state apartments, the mausoleum in turn being visited, Mr. Gildard, past hon. president, as an apprentice of Mr. Hamilton, office architect of the Palace, giving some interesting recollections of its designing and construction. The company then passed on to Bothwell, and there visited the Old Church, Dr. Pagan kindly meeting the members, and having read a short notice, conducted them over and around the building, and pointed out some of the grave-stones of interest. A vote of thanks to Dr. Pagan closed the day's proceedings, which were favoured by fine weather.

**Competitions. St. Jude's Church, Southwark.**—The Vicar of St. Jude's, Southwark, having recently determined to rebuild his church, a Building Committee was formed, and competitive designs were invited from a limited number of architects. On the advice of Mr. Aston Webb, who acted as the professional referee, the first premium was awarded to the design submitted jointly by Messrs. W. J. H. Leverton and Robert Mortimer, of 6, Delahall-street, S.W.; and the second to that submitted by Mr. A. R. G. Fenning, of 46, Lincoln's Inn-fields, W.C.

#### THE INSTITUTE OF BUILDERS: VISIT OF AMERICAN BUILDERS.

MR. JOHN S. STEPHENS, ex-President of the National Association of Builders of the United States, and Mr. George Watson, of Philadelphia, were entertained at dinner by the Council of the Institute of Builders, at the Café Royal, on Wednesday evening last. The chair was taken by Mr. Stanley G. Bird, in the unavoidable absence of the President, Mr. Frank May. After the usual loyal toasts,

The Chairman proposed the toast of "The National Association of Builders of the United States," in reply to which

Mr. John S. Stephens said:—Mr. Chairman and Gentlemen,—It affords us much pleasure to greet you on this pleasant occasion, and I desire to thank you in the name of the National Association of Builders of the United States, which I have the honour to represent, for this distinguished mark of your courtesy. While we are the fortunate individuals who have enjoyed this social occasion, we are not vain enough to take to ourselves any special merit, but ascribe it to your desire to honour the brotherhood we so humbly represent. In our infant country, as it is compared with your own,—for we have only lived about one hundred years, while you date back many centuries,—it could not be expected that we could have the massive and enduring buildings that we see here at every turn. Of necessity we were compelled to make our buildings of a temporary character compared with yours, both from a lack of means and a want of knowledge of what the future would require. But, gentlemen, that time has passed. Our Government, which by many was looked upon as an experiment, has proved a grand success, and after a hundred years of trial shows that it "came to stay," and we as builders are now erecting our eight, ten, and twelve-story buildings of as substantial a character, of as ornamental a design, of as indestructible material, as any you have here. We, as you are aware, are a peculiar people,—whatever we undertake to do is done on an immense scale; and now that we have commenced to build large buildings I hardly know where we will stop. One of our architects has prepared plans for a building twenty-six stories high, and of a proportionate size on the ground-plan. I hardly suppose we can suggest anything novel to you in the building line; still, I might say that in our very lofty buildings we use, largely, iron construction. Columns resting on immense foundations, laid securely in cement, support iron girders, which in turn support the iron floor-beams, thus becoming an iron tower, self-supporting, while the walls are but as veneering,—to enclose it. It is not unfrequently the case that we have the iron structure up six stories high, while the mason work is only two stories high. I must not trespass too much on your patience, but I do want to say a word or two about our Builders' Exchanges in America. They are, comparatively speaking, a new departure, but they have grown and spread wonderfully. If it does not tire you, I might give you a brief history of our local Exchange established only a little over two years ago in Philadelphia. First, the working men, having learned the lesson that in "union there is strength," organised societies and labour unions which, under wise or unwise rules, attempted to regulate the hours of labour, rate of wages to be paid, &c.; and by strikes, boycotts, and like means, enforced their demands. This could only be met by organisation among the employers. Secondly, our mutual friends the architects became more and more overbearing in their demands and contracts, and did less and less of the work that was required of them in the preparation of plans and specifications. Thirdly, the building mechanic did not realise his own importance in the community, and excepting a few individual cases, did not receive the consideration that his talents and ability demanded at the hands of either the architect or the owner. A few gentlemen met together to consider the situation, and the result was the organisation of the Exchange. Upon comparing notes and examining the statistics we learned that in Philadelphia alone we erected yearly from eight to ten thousand buildings, and handled from 30,000,000 to 50,000,000 dollars annually. The aggregate of the business compared favourably with that of many of our associations of merchants, brokers, shippers, and others who were looked up to as an impor-

tant factor in all that concerned the growth and improvement of our city. These facts being made known among the craft, we constantly received additions to our membership, and now number about 275 of the leading firms in the various branches connected with the erection of buildings. We have bought a large property, and are building a fire-proof office building for the use of members, architects, and others, as well as our meeting or exchange room, an exhibit-room for building materials, and a large room for trade school operations. Our rooms are open from 8 a.m. till 5 p.m. for the use of the members, thoroughly furnished with stationery, daily papers, trade journals, and everything that can be thought of that would be either useful or convenient. From 12.30 to 1.30 noon has been fixed as "change hour," when the members assemble daily for the transaction of business or friendly intercourse. By thus having a specified hour when we can be seen, or when we can see others with whom we are doing business, there is a saving of much valuable time which formerly was wasted in running from office to building in search of each other, either to give or receive necessary instruction. Daily intercourse between parties in the same line of business has done much towards abolishing the petty jealousies that formerly existed. I might go on telling you what has been accomplished, but I am certain it would weary you. I need only say that our National Association, in forming and fostering local Exchanges, is doing a good work, and, in addition, is establishing a more fraternal feeling between them and the architects. Joint committees have been appointed on behalf of the National Associations of Architects and Builders, who have already agreed upon a uniform contract that is meeting with much favour and coming into very general use. We also grapple with such questions as the Lein Law, permanent arbitration rules and conditions for estimating work, the apprenticeship problem, &c. Can you doubt that we are doing a good work for the benefit of the building mechanics of our country? But, gentlemen, I must stop talking.—I confess it is hard to do so when I get on this subject. We have stretched over 3,000 miles across our great country and clasped hands with our brother builders on the shores of the Pacific, and we tender you the same fraternal greeting across the 3,000 miles of the Atlantic ocean. Should any of you favour us with a visit, I assure you that you will find the "latch-string" hanging out, and a warm and fraternal greeting awaiting you on the inside (applause).

Mr. George Watson also replied, giving full details of the working of the technical schools and the Builders' Exchanges in America.

Other speeches followed from Mr. J. Howard Collis, Mr. Chappell, and Mr. Maton.

Mr. Basil F. Ellis proposed the health of the Chairman, and Mr. Stanley G. Bird's response concluded the proceedings.

**International Congress of Hygiene and Statistics.**—The first meeting of the General Committee, which includes representatives from the Universities of London, Oxford, Cambridge, Glasgow, and Aberdeen; the Royal Colleges of Physicians and of Surgeons of London, Edinburgh, and Ireland; the Sanitary Institute, Society of Medical Officers of Health, British Medical Association, Royal Institute of British Architects, Institution of Mechanical Engineers, Royal Institution of Great Britain, British Association for the Advancement of Science, the Society of Arts, Royal Colonial Institute, and many other leading societies, was held in the Parkes Museum last week, Sir Spencer Wells, bart., in the chair. An organising committee was appointed, consisting of Sir Douglas Galton, K.C.B., F.R.S.; Prof. W. H. Corfield, M.A., M.D.; Dr. E. Frankland, Dr. Ernest Hart, Prof. T. Hayter Lewis, Dr. E. D. Mapother, Dr. F. J. Mouat, Dr. Shirley F. Murphy, and Dr. R. Thorne Thorne, with power to add to their number, to organise arrangements for the meeting, which is to take place in London in 1891.

**The Water Supply of Tunis.**—The new waterworks for the supply of drinking-water to the City of Tunis have just been opened. They consist partly of new reservoirs, and partly of the old aqueduct supplying the City of Carthage with water, which has been restored for a distance of twelve geographical miles.



## Illustrations.

## ALTAR-PIECE, CHURCH OF SAN BERNARDINO, NEAR SIENA.

THIS is an illustration, from a photograph, of the altar-piece in the Church of San Bernardino, at the Monastery of the Osservanza, near Siena. It represents the coronation of the Virgin Mary with attendant saints, angels, and cherubim, and is in glazed terra-cotta. It is generally attributed to Luca della Robbia, with at all events considerable probability, as it displays strongly the characteristics of his style.

## ST. ETHELBURGA'S CHURCH, BISHOPSGATE.

IN carrying out the restoration and additions here proposed, the present clearstory is to be cleared away and rebuilt in the interior with bands of pale yellow alabaster and pale red brick, externally with yellow stock brick, polished red Devonshire marble being used for the jambs and arch of clearstory and new east windows. The new tracery is to be of Portland stone in all cases. The wall on the north side will be covered with mosaic representing, in the frieze, historical subjects connected with the diocese, below various saints; and panelled below with red Devonshire, with divisions of rose-coloured and green Killy Park marble; also from Devonshire, in the lowest portion; all strings are to be of polished Purbeck. The floors are laid with diagonally-placed squares of Aberdeen granite and black Ashford marble. The surbase to screens is of Mexican onyx. The reredos is of gilded oak, with paintings by the old masters copied in Venetian mosaic. The rood-screen is of framed oak, with painted panels, as are all stalls and screens. There would not be any portion of the Medieval work touched, in regard to the present aspect of the exterior towards the street. The roof also is of framed oak.

H. D. WILKINSON.

The drawing from which the illustration is taken is hung in the Royal Academy Exhibition.

## PLYMYARD, BROMBOROUGH, CHESHIRE.

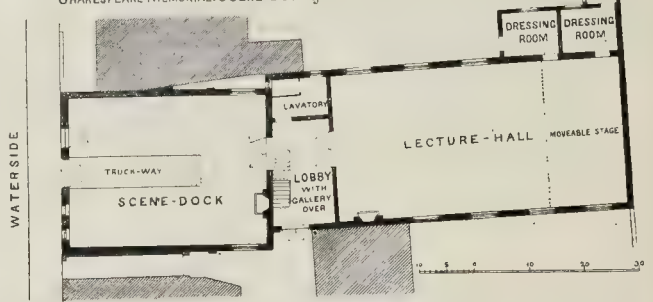
THE plan and elevations given of this house are sufficiently explanatory. The exterior walls are of red sandstone from the Hooton quarries. The upper part of one wing of the house, together with the stables and the lodges, is of half-timber work; oak, as left from the saw, being used. The roofs are covered with red Staffordshire tiles, and the rain-water pipes and heads are of lead. The interior is somewhat elaborately fitted; all the principal rooms have panelling to the lower part of the walls, that to the hall being 9 ft. high. The drawing-room fittings are of rosewood, the library of mahogany, and those of the dining-room, billiard-room, and hall of oak. All the ceilings are richly ribbed and ornamented in plaster. The hall is two storeys high, and has a gallery along one side of it connecting the two sides of the house. The walls of the kitchen, &c., are lined to the ceiling with Dutch tiles. The entrance-gates are of wrought-iron, and were made by Messrs. Barkentin & Krall, of London. Mr. Thomas Haigh, of Liverpool, was the sole contractor. The whole of the work was executed from special designs made by the architects, Messrs. Bell & Roper, of Manchester.

## SHAKESPEARE MEMORIAL, STRATFORD-ON-AVON:

## SCENE-DOCK AND LECTURE-HALL.

ADDITIONAL space for scenery being needed at the Shakespeare Memorial Theatre, and the site not allowing of an extension of the original structure, the building here illustrated was last year presented by Mr. C. E. Flower, chairman of the Memorial. The front is in Waterside, opposite to the theatre, and the scene-door opens into a paved passage flush with the street, so that scenery can be brought across on a truck and unloaded inside. Behind the scene-dock, and in communication with it, but with separate entrances also, is a hall 53 ft. long by 27 wide, to be used for lectures, concerts, dances, or theatricals, having a movable stage at one end and a gallery at the other. The materials are local red bricks and blue lias stone, with dressings of Campden stone, tarred fir and rough-cast in the gable, and plain red tiles on the roof. The works were carried out by Mr. G. Whately, of Stratford-on-Avon, at a cost of 757. The architect was Mr. Arthur S. Flower, M.A., of London.

## SHAKESPEARE MEMORIAL: SCENE-DOCK &amp; LECTURE-HALL.



## MEMORIAL CROSS TO THE LATE BISHOP OF LINCOLN AND TO MRS. WORDSWORTH.

THIS memorial stands above the graves of the late Bishop of Lincoln and his wife in the churchyard of the parish in which Riseholme House (until lately the episcopal residence of the Bishops of Lincoln) is situated.

The cross with its stepped base is composed of Irish grey limestone, while the large step upon which it stands is of the black variety of the same material, the whole being left unpolished. The total height of the memorial is 8 ft. 4 in., and the breadth across the arm is 2 ft. 4 in.; the stem tapers from 10 in. at the bottom to 7 in. at the top, the latter dimension being the width of the arms.

The nine medallions on each face represent scriptural subjects, those on the obverse—that is, on the side towards the graves—being taken from the life of our Lord; while those on the reverse, or western, side represent the typical subjects from the Old Testament.

The incidents selected for illustration on the obverse are as follows, commencing from the base:—

1. The Annunciation.
2. The Nativity.
3. The Baptism.
4. The Temptation (Our Lord treading the serpent under foot).
5. The Transfiguration.
6. The Crucifixion, occupying the centre of the Cross.
7. The Agony in the Garden, in the left limb.
8. The Entombment, in the right limb.
9. The Resurrection, in the upright limb.

And on the reverse are symbolised:—

1. The Creation of Light. Light being represented as the sun in the form of a mystical face set round with rays, and surrounded by the seven stars; the creating hand of the Deity being shown above.
2. The Creation of Life. Man in the Garden, with typical animals around him: the lion, the ox, the stag, and the peacock.
3. The Temptation and Fall of Man.
4. Noah building the Ark.
5. Moses and the Burning Bush.
6. The Brazen Serpent: in the centre and on the limbs.
7. David and Goliath; behind, the Agony in the Garden.
8. Jonah and the Whale; behind, the Entombment.
9. The Translation of Elijah; behind, the Resurrection, Elijah being represented as caught up to Heaven in a whirlwind of fire.

The circle connecting the arms forms a radiated glory around the central subjects. The sides of the cross are simply ornamented with interlaced patterns of somewhat intricate design.

The inscriptions on the eastern and western faces are given in the illustration; on the northern and southern sides occur the texts, "Rejoice in the Lord alway, and again I say rejoice," and "Praise the Lord, O my soul, and forget not all His benefits."

The whole of the carving and sculpture were executed by Mr. T. Nicholls, of Wincott-street, Lambeth.

J. A. REEVE.

## MONUMENTS IN LONDON CHURCHES:

## ST. HELEN'S, BISHOPSGATE.

ALL that now remains of the once-important Priory of St. Helen is the church which stands in a small square just off the main thoroughfare of Bishopsgate-street, from which it is approached by a gateway by the side of Crosby Hall. The casual visitor might easily pass close to the church without being aware of it, as no portion of it is visible from any of the leading thoroughfares. The church, from the outside, is in no way remarkable, consisting as it does of a nave and aisle with a small and mean tower erected in the seventeenth century, and yet inside it is, without doubt, one of the most, if not the most, interesting of all the City churches, and one of the few that survived the great Fire. The entrance is not, in the week day, through the small churchyard at the west end of the church, but by a seventeenth century doorway on the south side. The church is irregular in plan, and consists of a nave about 120 ft. long, a north aisle, known as the "Nuns' Choir," separated from it by a series of six pointed arches and pillars, a south transept, and eastward of the transept two small chapels dedicated to the Holy Ghost and the Virgin Mary. The nave and aisle together are a little more than 100 ft. wide, and the extreme width of the church at the east end is about 130 ft.

The Priory was suppressed by Henry VIII., and was of the yearly value of 376l. 6s., according to Speed, or 314l. 2s. 6d., according to Dugdale. The Nuns' Choir was then added to the parish church, and the rest of the property belonging to the Priory was sold by the King.

Stow merely mentions that "in this court standeth the faire Church of St. Helen, some time a priory of Blacke nunnas, and in the same parish Church of St. Helen." He goes on to enumerate the monuments of the dead, but of the forty he gives not more than six are now existing.

Since 1871, when St. Martin's Oteswich, or Outwich, was pulled down, the two parishes have been joined, and the monuments from the former have found a home in St. Helen's Church. Of the monuments mentioned by Stow three only have come down to us, the most interesting being that of Sir John de Oteswich and his wife, a drawing of which is here given. The Church of St. Martin Outwich stood at the corner made by the junction of Threadneedle-street with Bishopsgate-street. The old church, which survived the Fire, was pulled down and rebuilt 1796-7. A view of the old church can be seen in a curious book published in 1797 by Robert Wilkinson, together with many particulars of the church.

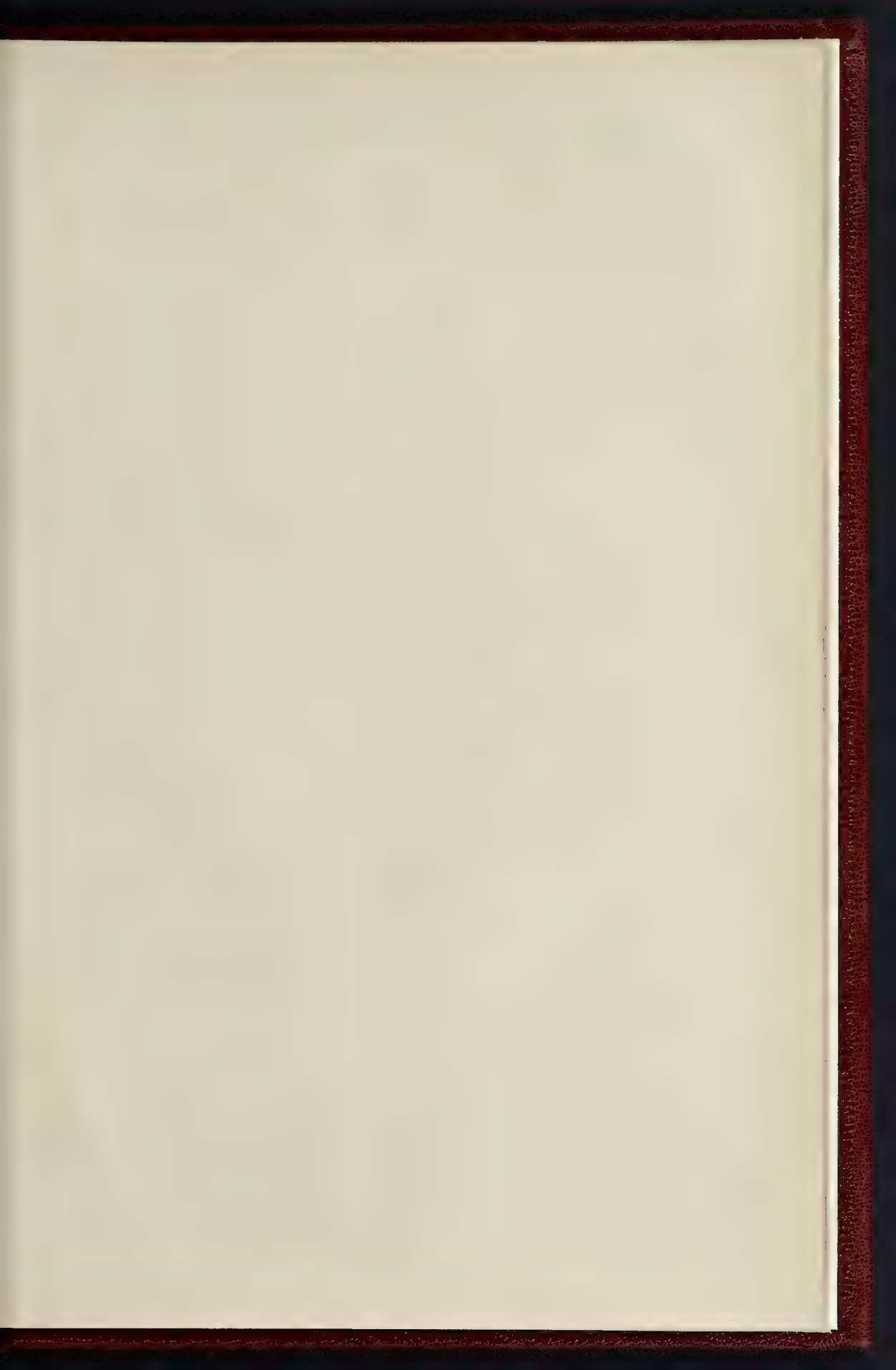
The document dissolving the Priory still remains in the Record Office. It bears date Nov. 25, 30 Henry VIII., 1538.

With the exception of the church there is no vestige left of the former conventual buildings, which must have been very extensive. Some slight idea of their magnificence may be gained from a drawing made on the spot in 1799, which shows the place where Bishopsgate-street and its surroundings now are to have been quite open country, with the remains of the Hall and a few crumbling arches.

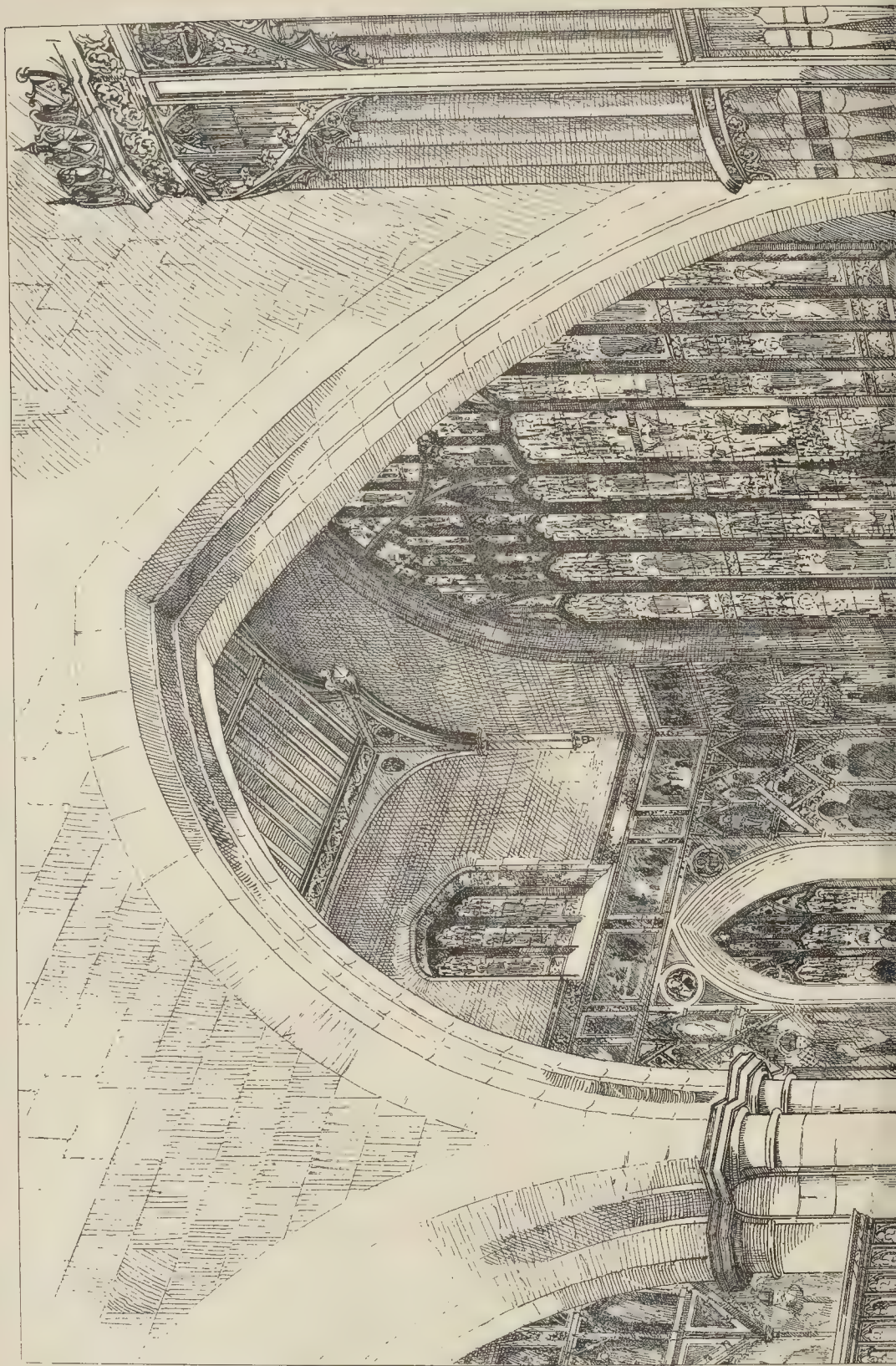
The Nuns' Hall and other houses were, after the Dissolution, purchased by the Leather-sellers' Company, who converted the Nuns' Hall into a common hall for the purpose of holding their meetings, and it continued in such use

**Walthamstow.**—The lowest death-rate ever registered has just been reported in this parish, viz., 8.5 per 1,000 per annum. This parish is reported to be well drained, and its health well cared for, by the Local Board and its officers.

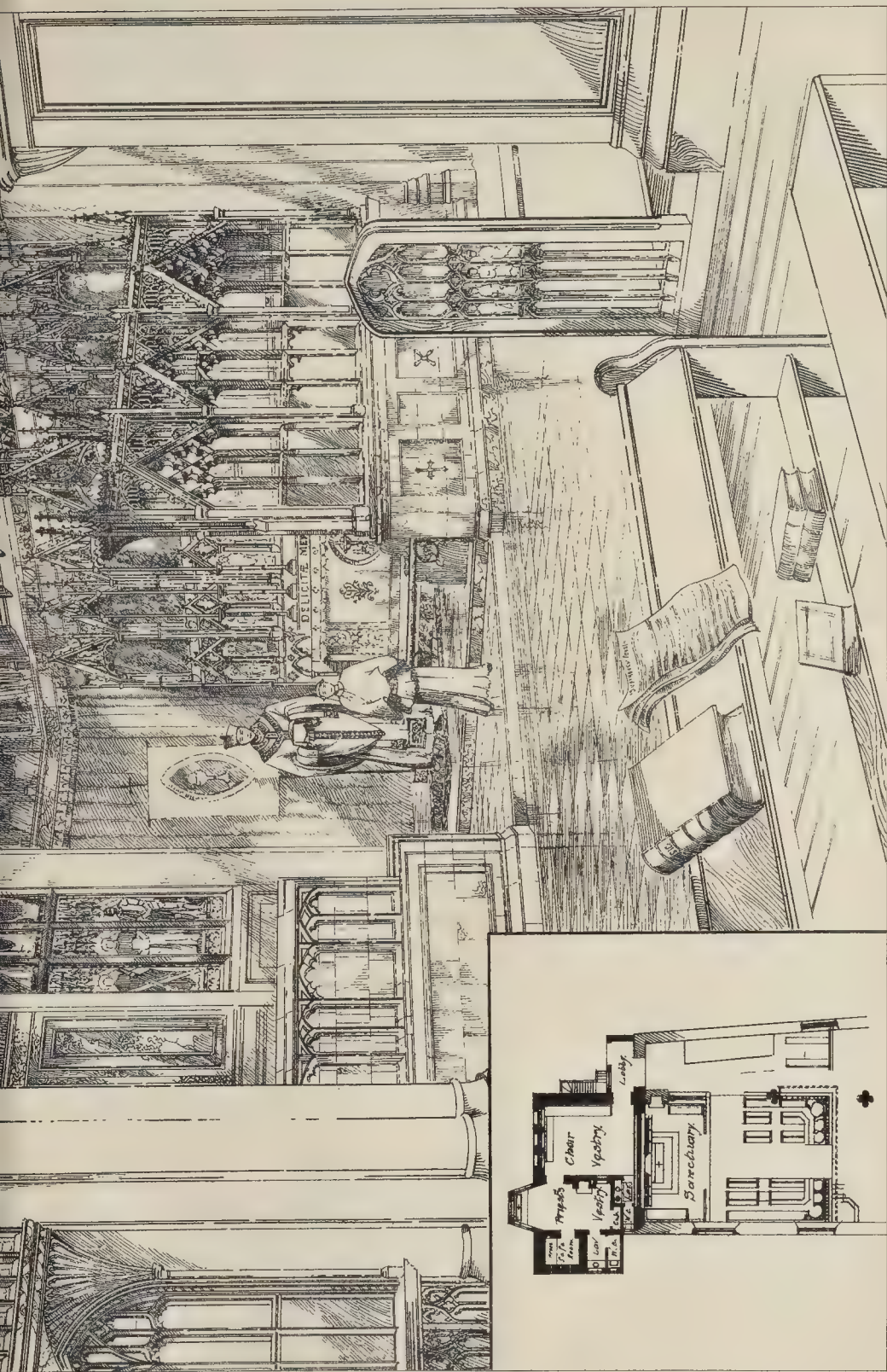




THE BUILDER, JUNE 29, 1883.



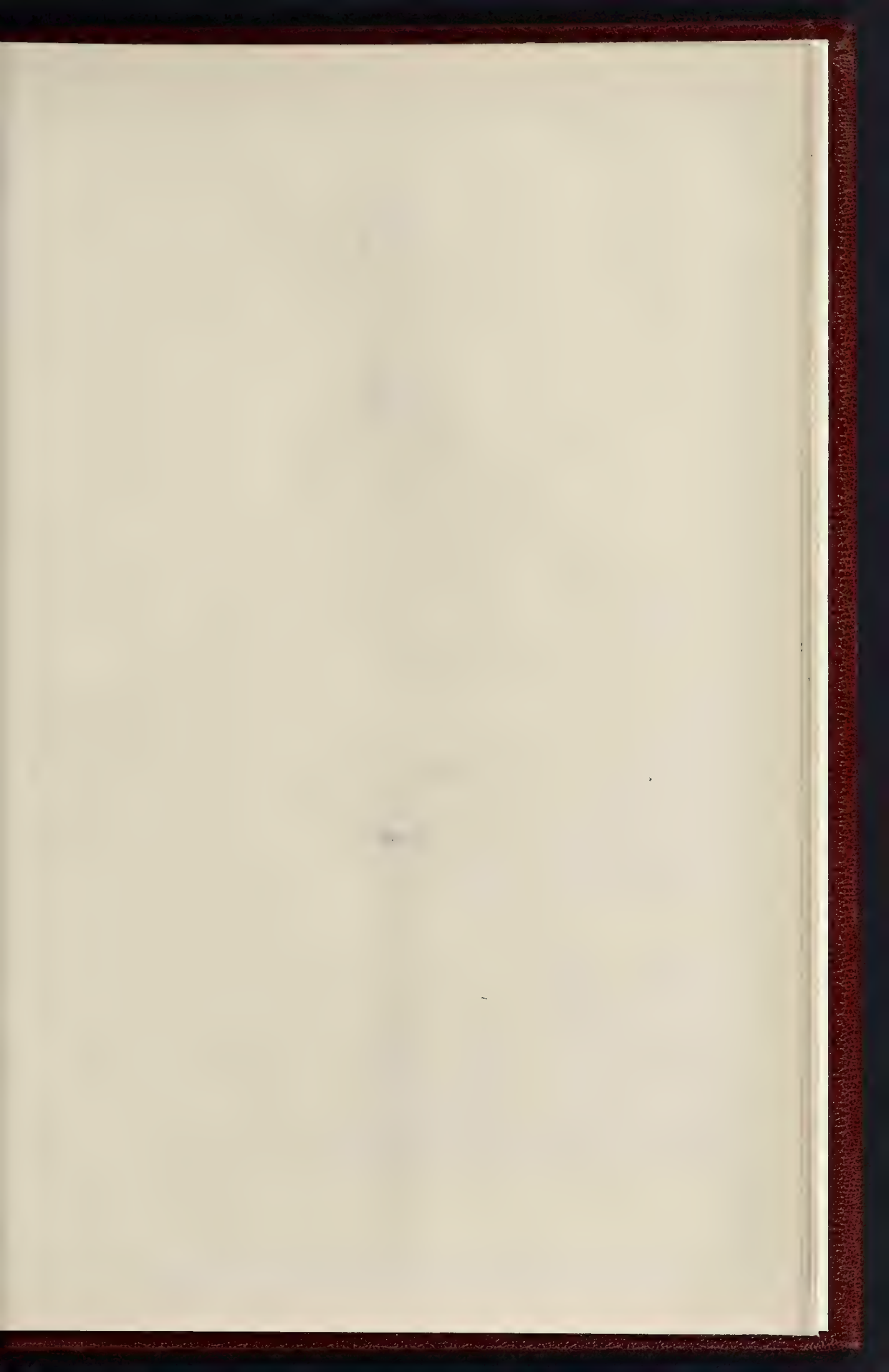




CHURCH OF ST. ETHELBURGA, BISHOPSGATE: THE CHANCEL.—MR. H. D. WILKINSON, ARCHITECT.





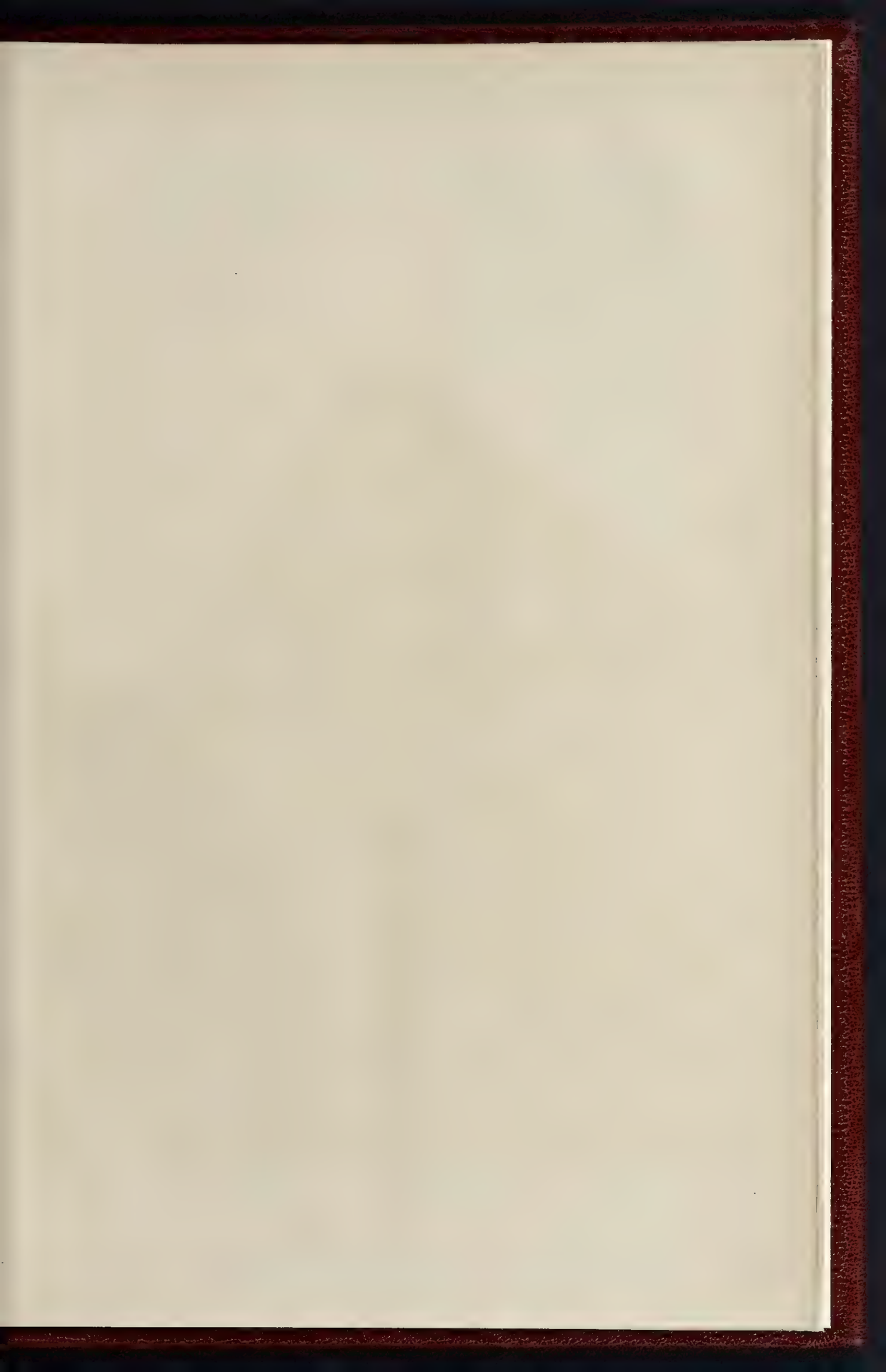




SHAKESPEARE MEMORIAL THEATRE, STRATFORD-ON-AVON: NEW SCENE DOCK AND LECTURE HALL.

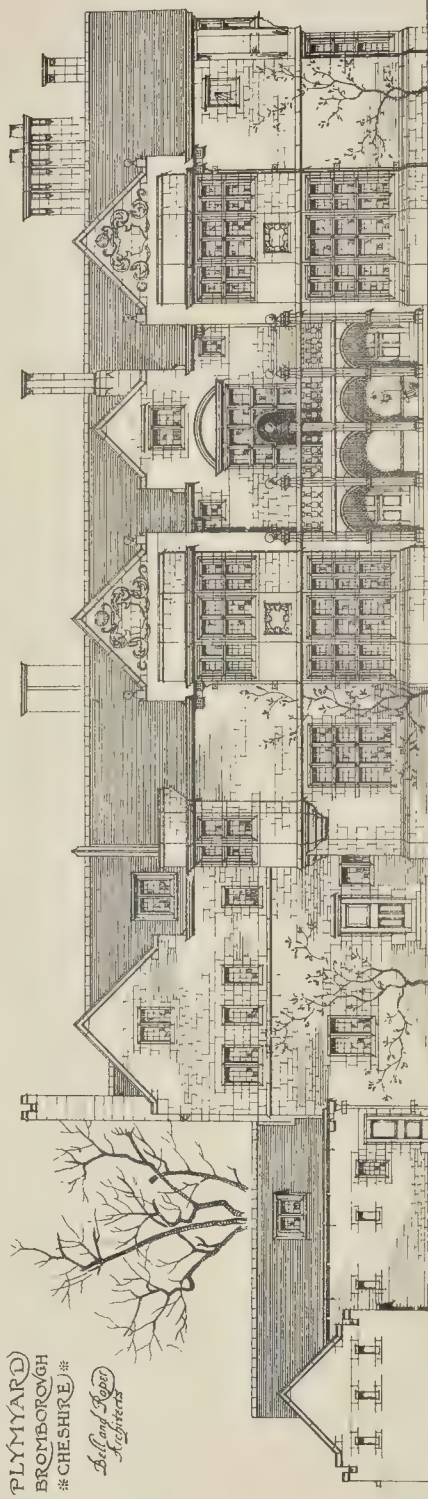
MR. ARTHUR S. FLOWER, M.A., ARCHITECT.





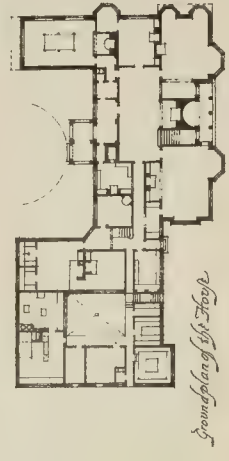
THE BUILDER JUNE 29, 1889.

PLYMOUTH  
BROMBOROUGH  
#CHESHIRE #  
*Ball and Seaton  
Architects*

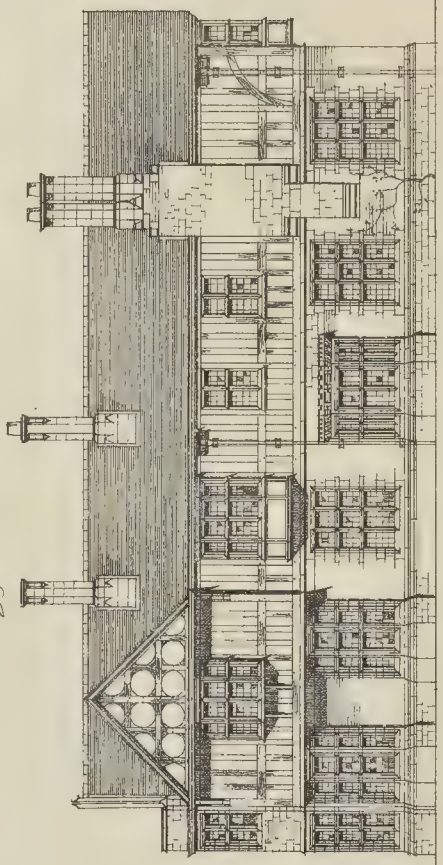


*Elevation of the Garden front*

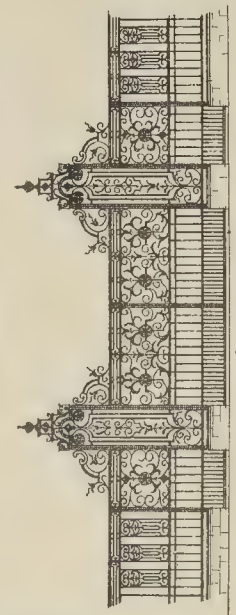
Scale 1/2 inch = 1 foot



*Ground Floor*



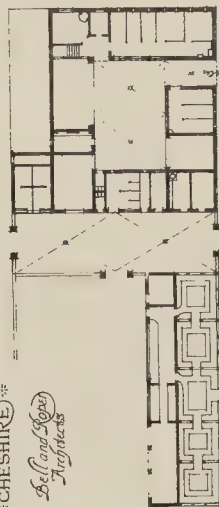
*South East Elevation*



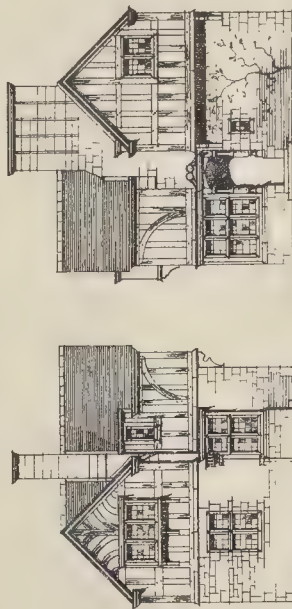
*The Entrance Gates*



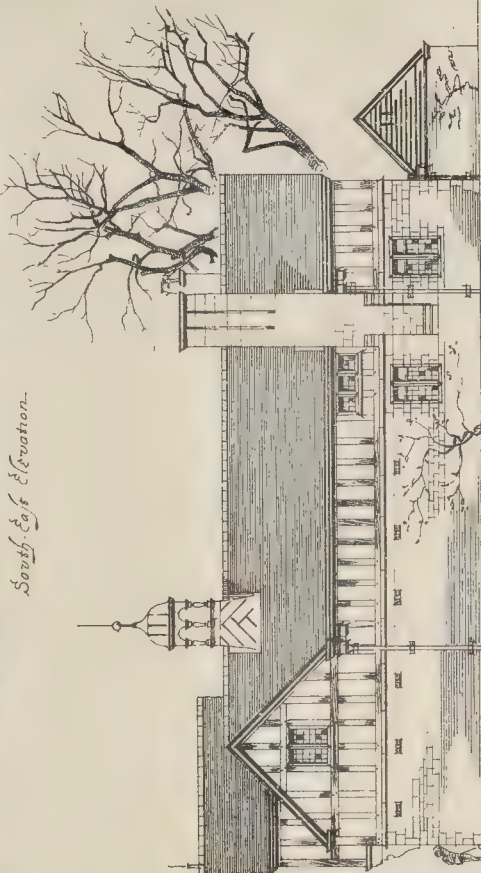
PLYMOUTH  
BROMBOROUGH  
\*CHESHIRE\*  
*Ball and Hopkin  
Architects*



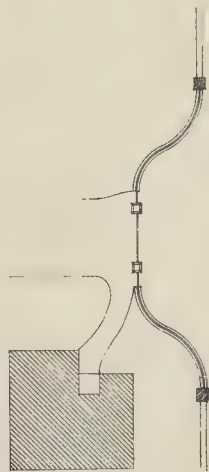
*Ground plan of the Stables etc.*



*South East Elevation.*



*South East Elevation.*



*One of the Lodges*



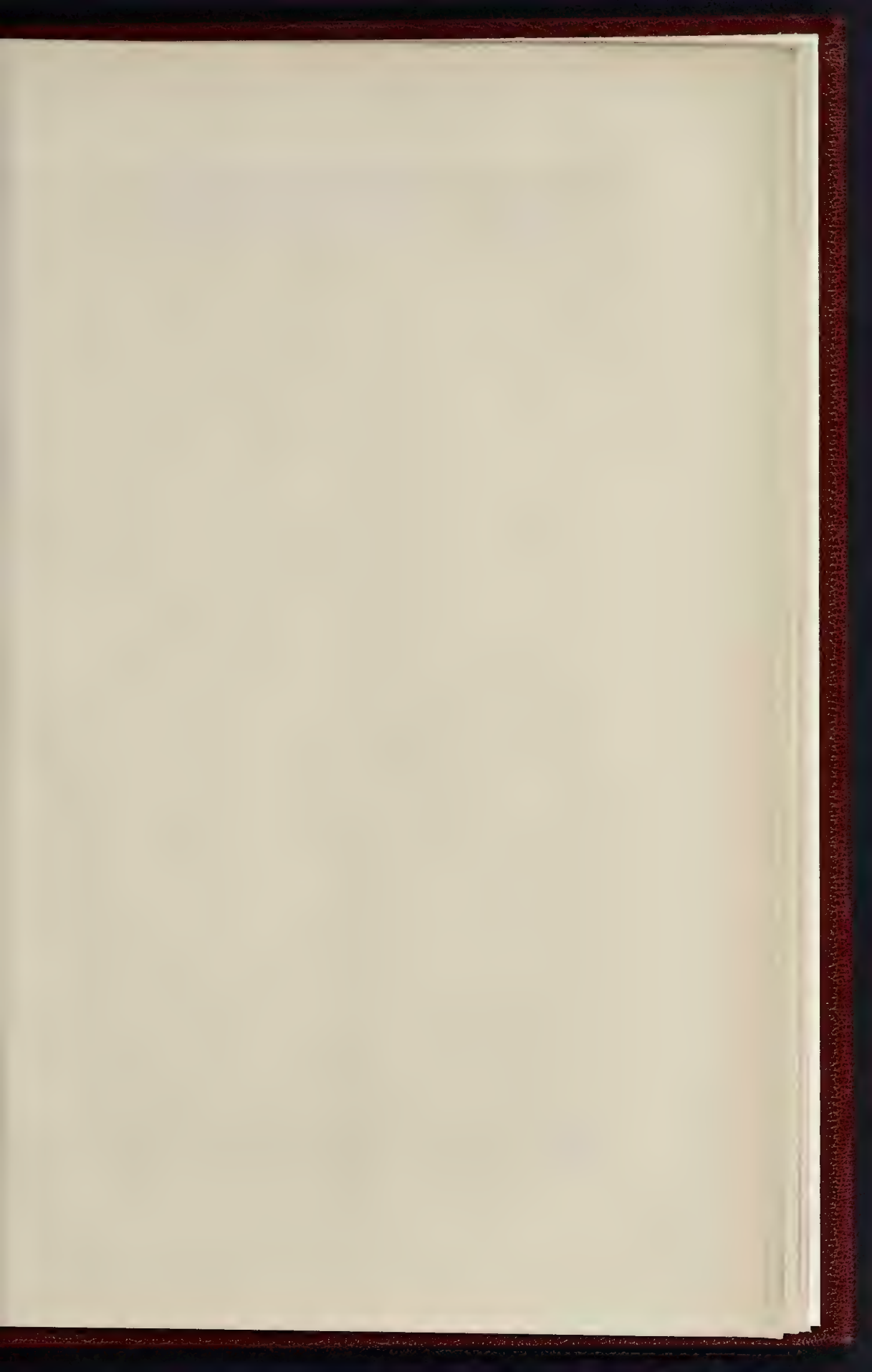




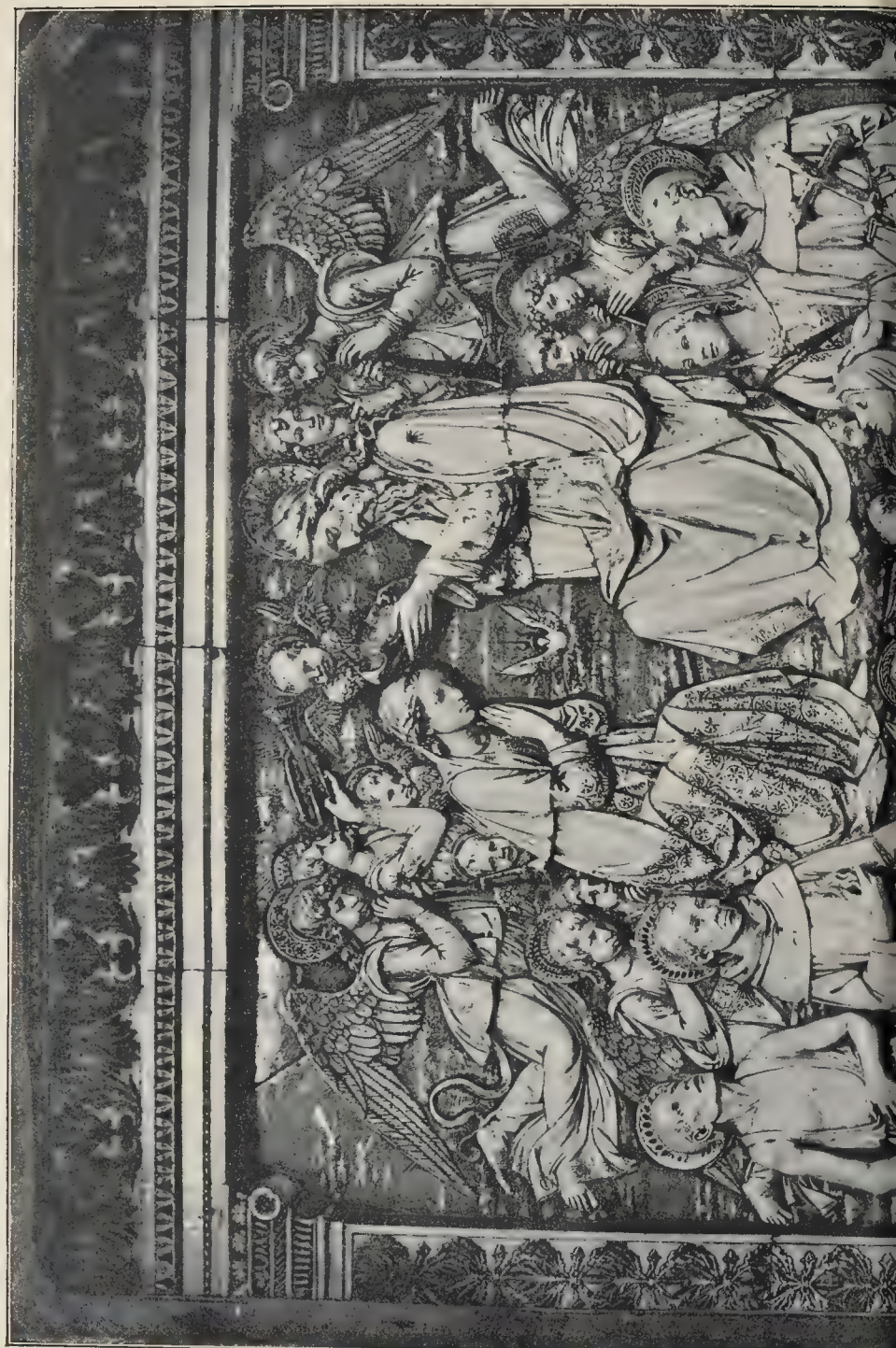
MEMORIAL CROSS TO THE LATE BISHOP OF LINCOLN AND MRS. WORDSWORTH.—MR. J. ARTHUR REEVE, ARCHITECT.







THE BUILDER, JUNE 29, 1889.







ALTAR-PIECE, CHURCH OF SAN BERNARDINO, NEAR SIENA.

*From a Photograph.*





until 1799, when all that still remained of the priory was demolished to make room for St. Helen's place. The remains of the buildings and the crypt, with the Leathersellers' Hall above, are engraved in Cox's "Annals of St. Helen's." A view of the church, with the remains of the priory, as it existed in 1801, is given in Malcolm's "Londinium."

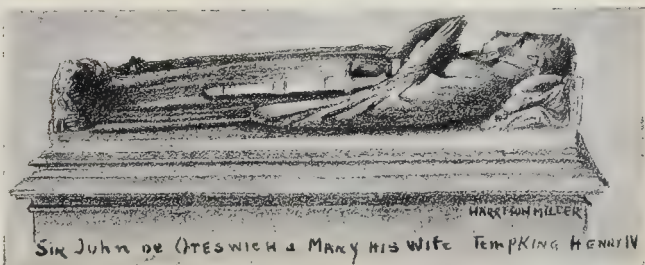
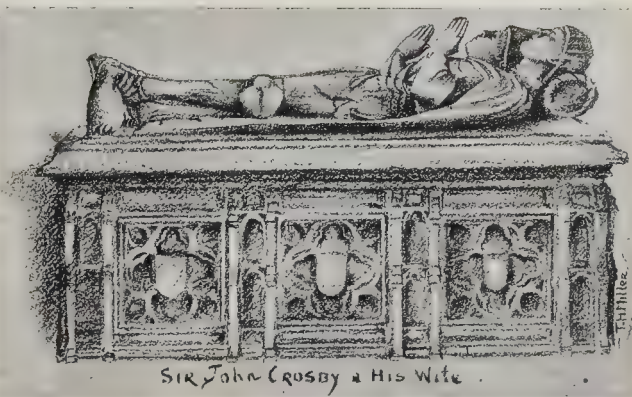
The parish church must have been in existence previously to the year 1010, as the remains of King Edmund the Martyr were removed from St. Edmundsbury and deposited herein for three years. The earliest portions of the church now remaining are the lancet windows of the transept, now blocked up; the staircase door in the south-east corner; the second arch north of the chancel; an ambury under the pulpit; the doorway which led into the convent on the north side, with the two openings formerly guarded with gratings; and a lancet-window at the west end of the same side. These date from the thirteenth century. At this date the floor of the church must have been much lower than it is at present, and it was raised at each alteration of the church, until it is now 4 ft. higher than the original level. This was discovered at the restoration of the church in 1865-8, and is still visible on the north side and at the staircase of the transept.

The western doorway, with its oak porch internally covering the entrance, is the work of Inigo Jones, who restored the church in 1633.

The Church of St. Helen is singularly rich in old tombs, fine specimens of the early fifteenth to the seventeenth centuries existing. Cox, its late historian, calls it, not inappropriately, the Abbey of the East. The following is a list of the most noteworthy of the tombs, illustrations of two of which are subjoined.

The earliest tombs that of Sir John de Oteswich and Mary his wife, and was placed here after the destruction of St. Martin Oteswich in 1374. It consists of two recumbent figures lying side by side, their heads supported on pillows held by angels. The feet rest against two grotesque animals, as is common to the sepulchral monuments of the day. The hands of both figures are folded in prayer. Considering the vicissitudes through which this fine work has passed it is in a high state of preservation. The man's hair is parted in the centre, and is long and arranged in curls; he has a moustache, and a beard trimmed into two points. He wears a long robe reaching to his feet and carried high up to the neck, and long open sleeves. A leather belt encircles his waist, and supports a dagger, upon the scabbard of which are the initials I.H.S., while on the other side there is a wallet. The hands are gloved. The expression of the man's face is calm and dignified, and from his habit and other signs John de Oteswich must have been connected with the civil rather than the military administration of his day. The face of his wife is rather sharp, with pointed nose and small mouth, and a somewhat vixenish expression,—a strong contrast to the man's face. She is clothed in a long robe which reaches from her shoulders nearly to her feet and is just slightly taken in at the waist. An under-garment is visible, reaching below the waist. The head is covered with a veil, held out by cushions placed on either side of the head. Ornamental bands run round the neck and round the gloves, which latter are long. This tomb is now in the Chapel of the Holy Ghost, and is figured in Stothard's "Funeral Monuments."

Another fine tomb is that of Sir John Crosby and his wife, situate in the chancel. The figures are recumbent, as in the monument just described, and rest on a Gothic tomb, as shown in the illustration. Sir John is represented in plated armour, strapped at the elbows and buckled at the wristbands, with thigh-protectors and leg-pieces. The hands of both figures are folded in prayer. The male figure has over his shoulders a falling mantle with a standing cape, and round his neck a collar of rondeaux. His feet rest against a winged lion, which looks up at him. He wears a dagger at his right side, supported by a singular belt, but no sword. His wife is shown clothed in a close-fitting robe cut to her figure, termed a *pietan corps*. The sleeves are long and tight, and over the back of her hand passes a singular band. A necklace of roses hangs round her neck, and over her shoulders is another outer robe. She wears a girdle round her hips, supporting a charm or cordon. Her feet are covered by her dress, and rest against two animals, probably pet dogs. Dogs are often found at the feet of male and female figures on monuments, either as companions of their sports or



Tombs in St. Helen's Church, Bishopsgate.



Window in the Lady Chapel, St. Helen's Church, Bishopsgate.

By Messrs. Heaton, Butler, & Bayne.



symbols of their rank. Richard II. had a favourite greyhound named Matt, whose transfer of attachment from him to the usurper of his crown is naively told by Froissart. The monument originally had this inscription (in Latin) on it:—"Pray for the soul of John Crosby, soldier, alderman, and, during a portion of his life, mayor of the staple of the town of Calais; and of Agnes, his wife; of Thomas, Richard John, John, Margaret, and Joanna, children of the same John Crosby, soldier. He died in 1475, and she in 1466. On whose souls may God have mercy." The hair of Lady Crosby is confined in a net, and surmounted by a headdress in shape not unlike a helmet when the vizor is raised. The face is beautiful, with a proud expression upon it. A veil falls off on the cushion and under her head, which lies upon a cushion supported by angels. This monument is engraved in Gough's great work.

There is a very sumptuous tomb in the north aisle to Sir William Pickering, who died in 1574. The figure is clad in beautiful chased armour, and is that of a tall, well-proportioned man, with handsome, grave face, slightly inclined to baldness, with moustache and beard trimmed and kept short. The hips are padded, and there are ruffs round the neck and wrists. There is a heavy sword at his side. The figure is recumbent, the head resting on a rolled mat, and lies beneath a massive canopy. Another handsome monument is that to Sir John Spencer, 1609. Sir John (in armour) and his wife lie side by side under an elaborate canopy, and at their feet the figure of a girl (their only daughter) kneels at a small desk.

The tomb of Hugh Pemberton (1500), now in the north aisle, was taken from St. Martin's Outwich. It is despoiled of most of its brasses, and contains no figures, only a Gothic canopy. The elaborate tomb of Richard Staper, alderman (1594, died 1608), representing the husband with his sons kneeling on the right side of a small desk, while his wife and daughters kneel on the left, was also brought from St. Martin's, and is now in the north aisle. The tomb of John Robinson and wife is very similar to the one last mentioned.

The tomb of Martin Bond (who died in 1643), captain of the City trained bands, is very interesting, as it displays to perfection the costume of the times. Bond is represented sitting at the door of a tent, while two soldiers are on guard, and a servant holds a horse. The monument is of black marble and alabaster.

There are other monuments to William Bond, 1576; Sir Andrew Judde, 1558; and a hideous one to Bancroft, 1726. Bancroft was allowed to purchase the space upon which his mausoleum stands in the north aisle, and the present large and ugly white marble erection is the result. He was the founder of the Bancroft Hospital.

The tomb of Sir Julius Cesar Adelmare is curious. It consists of the representation of a parchment deed, worded by himself in strict legal phraseology, and let into the top of a black marble altar tomb. He was afterwards made Chancellor of the Exchequer (in 1606). He died in 1636. The monument cost 110*l*.

A small figure in alabaster, on a bracket in the Lady Chapel, is worthy of notice. It is beautifully carved, and was looked upon as a figure of St. Helen, but it is, undoubtedly, a Sybil, and dates before the time of Michelangelo. There is no record to show how it came here.

The series of fourteen antique stalls, now forming the choir, were probably the nuns' seats. The elaborate carved pulpit is *circa* James I.

The tiles discovered in 1865 were reproduced by Messrs. Minton, and are used for paving the chancel, and are not only singular, but unique, the subject of a portion of them being a double-headed eagle, with evident reference to Constantine the Great.

St. Helen's Church still possesses five brasses, all of them interesting and excellent specimens of the art of metal-engraving. Mr. Cox, the latest historian of this church, gives no drawings of these brasses, which, considering the vicissitudes always attending these funeral relics, and the comparative scarcity of good examples, is rather surprising. Up to within a quite recent date brasses have been lost or seriously damaged through carelessness and neglect; and Malcolm gives an instance of a City church rich in old brasses which, when rebuilt in the eighteenth century, lost all its brasses through their having been sold as old metal to a plumber.

Of the two oldest brasses, one representing a

priest in full canonicals, and the other a female figure, date about 1400, no record seems to exist, and it is therefore impossible to say who are the persons commemorated. The one containing the effigies of a London merchant and his wife, in the costume of the period, is to the memory of Thomas Williams, gentleman, and Margaret, his wife. The said Thomas died Jan. 16, 1495.\*

The most elaborate and perfect of all the specimens is that of some distinguished gentlewoman of the latter part of the reign of Henry VII., whose costume is that which was worn by those aged ladies of that day who not unfrequently ended life in a nunnery as Lady Abbesses, or even as mere Sisters, to the no small emolument of the Church. Fairholt gives a drawing of a brass from the Church of Kingston-on-Thames, which represents Robert Skerne, of Kingston, who died in 1407, and his wife, Joan, which latter figure bears a strong resemblance to that of the brass in St. Helen's.

The fifth brass, to the memory of John Leventhorpe, Esq., a figure clothed in complete armour, has the following inscription:—

"Here lies John Leventhorpe, Esq., one of the four Keepers of the Chamber to King Henry VII., who died August 6, 1510. May God have mercy on his soul. Amen!"

The oldest memorial in the church is a plain strip of brass, recording the fact that Robert Cotesbrok lies here. Died March 11, 1393.

There were two other brasses originally in the church, one to the memory of Joan, daughter of Henry Seamer, and wife to Richard, son and heir to Robert, Lord Poyning, and the other to Thomas Benolte (A.D. 1534), Windsor Herald, and his two wives, the execution of which must have been exceedingly beautiful. It is said that drawings are still extant of these two brasses, and it is a pity they could not have been given in Mr. Cox's book. Gough alludes to them, but does not figure them.

Two other brasses let into one stone are from St. Martin Outwich; they represent John Brewin, rector, 1453, and Nicholas Wotton, rector, 1483.

Previously to 1865 there were many shields of arms in stained glass in the several windows of the church. Most of these were re-glazed elsewhere and utilised. The window in the Chapel of the Holy Ghost contains those that were in the window over the altar, blended with modern glass. There are eight coats of arms, viz., those of the City, the Grocers' Company, the Leather-sellers, the Merchants in Silk, Lady Crosby, Sir John and Lady Crosby impaled together. The eighth is supposed to be the arms of Sir Ralph Astrey, Lord Mayor 1493.

The first window in the north aisle contains the arms of the City, the Mercers' Company, Sir Thos. Gresham, and the Chicheley family.

The glass from the east window of St. Martin's is placed in the newly-discovered Lady Chapel and east dormer windows of the south transept of St. Helen's.

The church is full of coloured glass, but there is no special interest attaching to it. One of the windows,—that in the Lady Chapel,—is shown by the illustration on the preceding page. It is by Messrs. Heaton, Butler, & Bayne, and is somewhat original in treatment. The subject represented is "The Conversion of Constantine." Some of the windows are crude in colour and coarse and clumsy in drawing, and far too dark. It is with great difficulty the interior of the church can be seen, even on a light day, and when many of the windows themselves are of no particular artistic value it seems a great pity to shut out the light for the sake of getting a number of badly-executed windows.

The Shakspeare window recently put in in the north aisle is a most disappointing work. It is of Munich manufacture, and is absolutely devoid of interest, the ornamental portions being poor and not at all in harmony with the surroundings. If this is a fair specimen of modern Munich glass-painting, then the less we get of it in our public buildings the better.

It will be seen that the Church of St. Helen is full of interest to the student, as apart from its tombs "it contains," according to Cox, "specimens of almost every variation of the Pointed style, from the commencement

\* The Latin inscription is:—"Hic jacet Thomas Williams, generosus, et Margareta Uxor ejus qui . . . Thomas obiit xvi. die mensi Januarii, a dni, 1495, et . . . Margareta obiit die . . . mensi. Quorum animabus propitiatur Deus. Amen."

† The Latin inscription is:—"Hic jacet Johannes Leventhorpe, Armig nup. unus quatuor hostiariorum, camerarius regis Henrici Septimi, qui obiit vi. die Augusti, A. dni. MV. Xciii. die. Episcopus Deus auct."

of the thirteenth century to the declension of its use, when it yielded to the newly-imported architecture of Italy," one of the earliest specimens of which is to be seen in the woodwork of the porches and portions of the choir, and the two curious twisted Corinthian columns supporting an entablature highly enriched, and an attic panel now fixed to the pillar dividing the choir from the Chapel of the Holy Ghost. Upon the frieze are the arms of Sir John Laurence, Lord Mayor 1665. The use of this curious piece of woodwork was to sustain the Lord Mayor's sword and mace.

Those who are interested in the Church of St. Helen should consult Dr. Cox's "Annals of St. Helen's,"—Stow, Dugdale, Malcolm's "Londonium," and Gough and Stothard's "Funeral Monuments." The engravings in Stothard are very fine.

## THE LONDON COUNTY COUNCIL.

A SUPPLEMENTARY Meeting of the Council was held in the Board-room, Spring-gardens, on Friday, the 21st inst., Lord Rosebery in the chair, to consider the question of

*The City Livery Companies and their Properties.*  
—This question was dealt with in a report brought up by Alderman Lord Hobhouse, Chairman of the Corporate Property and Charities Committee. This report recommended

"That Her Majesty's Government be requested to introduce into Parliament without delay a measure for the purpose of carrying into effect the reforms contemplated by the majority of the Royal Commissioners appointed in the year 1880, with reference to the Livery Companies in London, including a Bill on the principle of that which was introduced by Sir Charles Dilke and the Attorney-General in 1885."

The report stated that the value of the property legally vested in these companies was about £15,000,000, and pointed out that whereas in former days the companies were looked to as supervisors and regulators of their respective trades, and as trainers of young men therein, those functions, with only a few exceptions, had passed away. The majority of the members of the Royal Commission referred to in the Committee's recommendation suggested legislation for the following, among other purposes:—

- (a) Restraining the Companies from alienating their ancient Corporate property.
- (b) Securing the permanent application of a considerable portion of the corporate income to useful purposes.
- (c) Declaring new trusts of the trust property where a better application has become desirable.
- (d) Publication of accounts.
- (e) Scholastic and scientific objects; i.e., education, elementary, secondary, classical, and technical, and scientific research.
- (f) General public purposes; e.g., hospitals, picture galleries, museums, public libraries, public baths, parks, and open spaces.
- (g) The improvement of workmen's dwellings, and where the companies represent trades, subsidies to the benefit societies of such trades.

Of course there was considerable opposition to the recommendation of the Committee, but after a long discussion, the recommendation was carried by fifty-five votes for to fifteen against.

The usual weekly meeting of the Council was held on Tuesday last, in the Council Chamber, Guildhall, Lord Rosebery in the chair.

*Tenders.*—The first item of business on the agenda paper was to receive tenders (a) for the repair of two viaducts on the East Park estate, Hampstead; (b) for supplying and fixing 100 seats in Clissold Park. The lists of tenders, which were referred to a Committee, will be found under the heading "Tenders" in this week's *Builder*.

*Contracts and the Rate of Wages.*—Considerable time was occupied by the consideration of additional Standing Orders and References to Committees. The last paragraph of the "References" to the Asylums Committee was as follows:—

"The Committee shall require from any person or firm tendering for any contract a declaration that they pay such rates of wages, and observe such hours of labour as are generally accepted as fair in their trade, and, in the event of any charges to the contrary being established against them, their tender shall not be accepted."

Mr. Bassett Hopkins suggested the insertion of words to the effect that any such declaration as that mentioned should be deemed to be of the essence of the contract. After some discussion, however, it was resolved that this paragraph and all other similar paragraphs in the "References" should be referred to the special Contracts Committee appointed two or three weeks ago (see *Builder*, June 8, p. 433.)

*Dangerous Structures.*—The first paragraph of the Building Act Committee's report was as follows:—  
"The attention of your Committee has been directed to the absence of any arrangements for notifying to the District Surveyors the existence of dangerous or neglected structures within their districts. It appears not to be the duty of any officer of the Council to make such intimation, and the District Surveyors have to rely upon casual communications, or their own observations, to make them acquainted with the existence of dangerous walls or buildings. This



deficiency is particularly marked in cases where there is imminent danger to buildings resulting from fire, and your Committee are informed that it has never been the practice to give official notice to the District Surveyor in such cases. Your Committee think that it would greatly assist the District Surveyors if the daily returns of fires in the metropolis were communicated to them, so far as these relate to serious or extensive fires, in order that they may visit the respective localities, and ascertain the existence of any dangerous wires on buildings, and your Committee recommend that the Fire Brigade Committee be instructed to make the necessary arrangements accordingly."

This was unanimously agreed to.

**The Housing of the Working Classes.**—The Report of the Committee on the Housing of the Working Classes contained the following paragraph and recommendation:—"On April 30 last, the Council, on the recommendation of your Committee, instructed the Solicitor to lay a case before counsel upon certain doubtful points which had arisen as to the construction of the Acts relating to the Housing of the Working Classes. A case was accordingly laid before Mr. Meadows White, Q.C., who prepared a valuable opinion bearing upon several of the points at issue. As regards the duties of the Medical Officer, Mr. Meadows White is of opinion that the Council might, with the consent of a Secretary of State, appoint its Medical Officer, recently appointed under the Local Government Act, 1888, to be its Officer under Sec. 13 of the Act of 1875, and that in such a case he might make the necessary official representation and initiate proceedings. Such a special appointment would, however, be necessary, as his general appointment under the Act of 1888 does not give him the requisite power. This, in the opinion of Mr. Meadows White, might give the Council greater freedom of action under the Acts, and greater choice of sites of operation under the Acts than heretofore. Your Committee think it desirable that the Council should apply to the Secretary of State for his assent to the appointment of Mr. Shirley F. Murphy as Medical Officer to the Council under Sec. 13 of the Act of 1875, and they recommend that application be made to the Secretary of State accordingly."

This was agreed to, and after transacting other business, the Council adjourned.

#### CASES UNDER THE METROPOLIS MANAGEMENT AND BUILDING ACTS.

##### *Infringement on Line of Frontage.*

At the Hammersmith Police-court, Richard Jones, of 170, Askew-road, Shepherd's bush, was summoned by the London County Council, for that at the above address he did unlawfully erect a building beyond the general line of buildings in Askew-road, without the consent of the Council, contrary to sec. 75 of 25 and 26 Vic., c. 102.

Mr. Thos. Burton, solicitor, appeared for the Council, and Mr. A. Abrahams for the defendant. Mr. Millwood, surveyor to the Council, having produced and proved the Superintending Architect's certificate showing that the building was beyond the general line of buildings in Askew-road,

Mr. Curtis Bennett said he should make an order for the demolition of so much of the building as came before the general line within a month, with costs.

##### *Wooden Structures.*

Henry Hall, of Fleet-road, Hampstead, appeared before Mr. Cooke, at the Marylebone Police-court, on an adjourned summons, taken out by Mr. Smallpiece, District Surveyor, for putting up five wooden structures or erections of a movable or temporary character, without having obtained the licence of the London County Council. Mr. Froke Palmer defended.

Mr. Smallpiece stated that the structures consisted of a canvas booth, a steam roundabout 30 ft. in diameter, with a canvas roof, a shooting-gallery with an iron roof and a wooden front, and a travelling caravan. Most of them were on wheels, and close to the property of the adjoining owner. Mr. Palmer said his client had nothing to do with the show-booth, and Mr. Smallpiece withdrew the summons in respect of it. In cross-examination, Mr. Smallpiece said he supposed it would take about a week to get the licence of the London County Council. Mr. Palmer produced an official document to show that the Vestry recorded rates on an assessment which included the land in question, let out for the purposes of swings, &c.

Mr. Cooke, in giving his decision, observed, that he had nothing to do with what the Vestry had done. This was a matter for the County Council. The mere question of swings was not before him. What he had to decide was the question of the erection of a certain building. It was not necessary that the building should consist of bricks and mortar—it might be constructed of wood; nor was it necessary that it should be fixed to the ground. There were two decisions which bore on the case, that in the case of Quiller's "Smart being of considerable importance." The Act 45 Vic., c. 14, sec. 13, was as follows: "It

shall not be lawful for any person to erect or set up in any place any wooden structure of a movable or temporary character (unless the same be exempted from the operation of the first part of the Metropolitan Building Act, 1855) without a licence in writing first had and obtained from the Board." The Act, therefore, included wooden structures and movable erections in any place whatever. The object was quite clear, to protect against fire. There were certain exceptions in the Act, but these structures did not come within that category. Of course, a mere pole put up for children to swing upon would not come within the meaning of the Act, but a steam roundabout with an organ in the centre, and a canvas cover over it, such as had been described, was specially a building within the meaning of the Act, for which it would be necessary to get the licence of the London County Council. He should fine the defendant in the nominal penalty of 20s. and 2s. costs. Mr. Cooke said that he did not intend his decision in this case to be a side wind for doing away with fairs; that could be done in a different way.

##### *Neglect to Give Notice.*

At the Lambeth Police-court J. O. Curtis was summoned by Mr. Geo. Elkington, District Surveyor of Penge, for neglecting to give notice of a small wooden office at a timber yard in Oakfield-road, adjoining Penge Station, contrary to the Building Act.

The defendant said it was not necessary to give notice as the building was only a wooden one.

Mr. Partridge said he should hold that notice was necessary, and fined defendant 40s. and 12s. costs.

At the Hammersmith Police-court, Charles Butcher, a builder, was summoned by Mr. A. Mosley, District Surveyor of Fulham, for erecting houses in Duford-street without first giving notice as required by the Building Act. The case was gone into recently upon another summons, in which Mr. Mosley stated that he received notice in the name of Chas. Bryan, but when a statement of fees was sent in, it was returned. That summons was withdrawn, but as the defendant admitted that he had succeeded Bryan, and had failed to give notice of the change, a summons was granted for that offence. The case now came on for hearing, and Mr. Mosley said it was one of considerable importance, because if builders could set up bogus names, there would be no remedy in cases of irregularity. He added that Bryan was employed to do the labour, and was known by other names.

Mr. Frank Boyton said he let the plots of land to the defendant.

The defendant said he had power, under the agreement, to let the land at improved rents.

Mr. Curtis Bennett said he thought it was a bad case, and fined the defendant 10l. and 4l. 4s. costs.

##### *Laying-out of New Streets.*

At the Wandsworth Police-court, Major Jas. Childs, of Cedar Lea, Clapham-common, was summoned by the London County Council for unlawfully forming or laying out a certain road, passage, or way, on the north side of Malva-road, Wandsworth, for building, as a street for carriage traffic, and as a main road, passage, or way, which would not afford direct communication between two streets, without the sanction of the late Metropolitan Board of Works or the London County Council, their successors in law, contrary to 45 Vic., cap. 14, sec. 7.

Mr. Thos. Burton, solicitor, appeared for the London County Council, and Mr. Glen for the defendant.

Mr. Burton said the facts were that the defendant in 1885 gave notice that he would lay out three streets running out of and returning into Malva-road, and in March last the defendant first commenced building; and his contention would be that such laying out in this way was a clear attempt to evade the Act.

After hearing the surveyor for the Council, and the defendant, Mr. Plowden said he should decide that the defendant had complied with the Act, and should dismiss the summons, with 2s. 6d. costs.

##### *Notice of appeal was given.*

At the Hammersmith Police-court, Thomas Godfrey, a carpenter and builder, was summoned by the London County Council for laying out Keith-road, Uxbridge-road, without making direct communication between two streets.

Mr. Chivers, from the County Council, said that on March 5 the defendant was convicted on two summonses, and the road was laid in the same condition, no building having been done to comply with the Magistrate's order, and he was instructed to ask for the continuing penalties.

Evidence was then given showing that the defendant had rendered himself liable to penalties for ninety days.

Mr. Farman, who defended, wished to reopen the case on the merits, but Mr. Curtis Bennett said he should not allow this to be done. Then Mr. Farman said it would cost 2,000l. to make the necessary communication.

Mr. Curtis Bennett said he should fine the defendant 50l., being a moiety of the penalties, with 2s. costs, the amount to be paid within twenty-eight days; in default defendant would be imprisoned for three months.

#### CAMBRIDGE UNIVERSITY LIBRARY ADDITIONS.

SIR.—In your somewhat unfavourable notice of the drawing in the Academy of Mr. Pearson's addition to the Cambridge University Library, you have overlooked the incomparable difficulty of the problem to be solved. In the centre of the site occupied stands the beautiful, but unfinished, gateway of Henry VI. When Cockerell's classical building was erected, about half a century ago, it was proposed that the gateway should be destroyed or erected elsewhere, and that the quadrangle should be completed in uniform style. It is a sign of progress that the quadrangle is now being completed without the destruction of the gate.

The problem set to Mr. Pearson was to build the west side of a court, of which the north side was built by Cockerell (circa 1835), the south side by Scott (circa 1862), and the middle of the west side by Henry VI. (circa 1445).

A. H. S.  
\* \* \* We had certainly forgotten at the moment that the central gateway was old; but if English architects will persist in their unscientific practice of exhibiting mere pictures with nothing to show the plan and the practical conditions which are the basis of all architectural work, they have only themselves to thank if they are misunderstood. No French architect would think of exhibiting a drawing of such a scheme without a fully explanatory plan. As to the matter of our criticism, however, we do not consider the conditions named make much difference. If it is contended that it was impossible to connect the old gate and Cockerell's building in any logical manner, we should call that a humiliating confession for an architect to make; if (as the drawing seems to indicate) Mr. Pearson was careful to show the Medieval gateway, but cared not a jot how he treated Cockerell's building, because it was Classic, that is merely architectural bigotry; and Cockerell, both as a gifted architect and a man of high intellectual culture, had a claim to have his work treated with more respect.—Ed.

#### THE CITY WALL.

SIR.—Apologies of your notice [p. 449, *ante*] of the alterations now being carried out in Ludgate-hill, on the site of the gate, may I call your attention to the fact that during the last two or three weeks excavations have been in progress on the site formerly occupied by Aldgate? The Corporation have been widening Duke-street, the houses on the eastern side of that thoroughfare having been pulled down and the frontage set back several feet. Messrs. Mills & Co.'s premises at the corner of Duke-street and Aldgate occupied nearly the site of the old gateway, and when the building was removed and the foundations exposed, the remains of the wall were found on the eastern portion of the site, and to the west and south-west of this the workmen came on massive walls, which extended across Duke-street and were continued under the present roadway of Aldgate, possibly the solid foundations of a tower or other structure attached to the gateway. The construction seemed chiefly of rubble, large masses of limestone being mixed with pieces of grit-stone, brick, tile, &c., the whole firmly bonded with mortar, forming a solid mass that had to be broken with wedges. The remains found were probably of Medieval date, though pieces of Roman tiles appeared to occur here and there, suggesting that the remains of an earlier structure, or perhaps a part of the Roman wall, had been used in the work. Less alteration would seem to have taken place in the eastern part of the City wall than was the case elsewhere, and remains of the original Roman construction have been found at a number of points between the Tower and Bishopsgate within the last few years.

R. B.

#### TENDERS.

SIR.—How quickly we feel the shoe pinch when it is upon ourselves. In the *Builder* for the 8th inst., p. 933, a firm of contractors publish a complaint. The Kent County Authorities are asked to give them a list of the tenders required for some work for which the complainants had estimated. Your correspondents feel aggrieved. We heartily sympathise with them. It is of vital importance to contractors that such information should be readily obtained by them. It gives to the individual a most valuable check on his system of tendering, leaving out of account any question of fair play. No wonder contractors feel aggrieved when information of this kind is withheld. Granting so much, we should greatly like to know how many contractors do as they would be done by. They are constantly asking for tenders from merchants, from manufacturers, and others. How often do they give to persons so tendering the information which they themselves so value, and the withholding of which they feel to be such a grievance?

Our own experience is that it is the exception, and not the rule, for contractors to give any information whatever as to tenders received by them. But it is quite as important for manufacturers to know by whom and by how much they are underbidden, or of the difference between the accepted and unac-



cepted tenders, as it is for contractors to obtain this knowledge. We are quite of the opinion contained in your editorial footnote that "to refuse to give a list of tenders is not only unfair and discourteous to the firms tendering, but impolitic." The faintest feeling of justice would seem to dictate that contractors themselves should not be the only exceptions to the general rule.

Bristol.

ARTHUR LEE & BROS.

#### THE TEMPLE FOUNTAIN.

SIR,—Allow me to complain of a fountain spoiled, and there are few fountains indeed in London. Simple as it used to be, with its single tinkling jet, rising and splashing back in the light of the sun, among the tender green lime-trees overshadowing the pavement, anybody accustomed to pass by the courts of the Middle Temple will know what fountain I allude to.

They did put a stucco crane in the middle, but I suppose it has crumbled away. My main complaint is against the surrounding meagre twisted iron bar fence. The circular basin is set in the middle of this square. The spaces between the four lines of the square and the round is filled in with staring mould, in which grow or straggle some miserable, stunted laurel shrubs. The thing is an abomination. The twisted iron railing should be removed, and the small suburban garden iron imitation pebble-border round the mould line flung into the Thames, followed by the shrubs. A more graceful centre for the water rising might be imagined—a metal figure, perhaps; then, sloping down to the water's edge, and about 4 ft. wide, a smooth turf ring following the outline of the basin, then a flag-stone paving, 2 ft. wide, for the sitters' feet to come upon,—and last, not least, four or five low stone seats for three each, at intervals, curved to follow the outline of the outside circle.

With the privacy of the Temple and its guardians (I noticed the attendant asking a young man not to sit even on a railing in the vicinity), there ought to be no difficulty in keeping the turf border in a perfect state.

TEMPLAR.

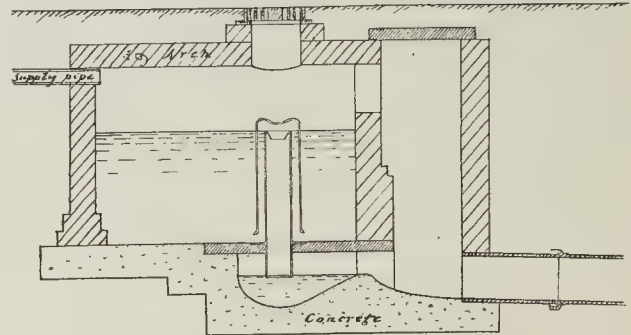
#### The Student's Column.

##### TOWN DRAINAGE.

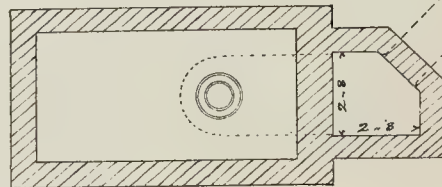
XXVI.—SEWERS: THEIR UPPER ENDS.

**I**N the concluding article of this series we make a few remarks on some points of sewerage and sewage-disposal; but first we may say that in large manufacturing towns the Sanitary Authority sometimes undertakes the flushing of the drains of small houses where, as is usual, a number can be combined together. This is done, at no great expense, where such houses have a common yard or court, by means of the trough-closet or latrine system, where there is a road at the back or where the closets are approachable from the public street. But this system can only be adopted by placing the flushing under the charge of the Sanitary Authority. A long trough, kept charged with water, belongs to four or more houses. Access to the outlet valve is given at the back to one of the sewer-men, who discharges and refills the trough once a day, and when the place is well arranged he does this without the necessity of entering the premises. It may be observed that the interval of time determined upon should be strictly attended to, whether it be once a day or otherwise. The system is somewhat the same as that of the latrines of a military camp, and is suitable also for factories and large workshops. A cistern overhead is supplied with water from the street main, and from this the trough—which, however, is not so much a trough as a series of earthenware pipes, each 2 ft. 6 in. or 3 ft. long, jointed in the same manner as large sewer-pipes, and each one having a vertical branch,—is flushed at regular intervals of time. The flushing may be done by an automatic siphon placed in the tank overhead, the dimensions of the discharge-pipe being such as to empty the tank at short intervals. For a length of trough of 12 ft., which may contain three or four divisions, the tank holds 50 gallons; for a greater length 75 or 100 gallons. With this automatic arrangement there is no outlet valve, the water being confined to the trough by a lip at its lower end, over which the contents are discharged.

Near the boundary of the drainage area, in the upper parts of a system of sewerage, the sewers require regular flushing. The house-drain junctions are far apart, and while each house-drain may be kept free from deposit by its own provisions, when the sewage enters the larger dimensions of the sewer those provisions no longer take full effect. Moreover, the sewers being in public roads, and these, in the



SECTION



PLAN

Sewer Flushing-Chamber.

upper parts of the town, being perhaps made and repaired with broken stone,—or "macadamised,"—the grit which is washed into the sewers from road surfaces is a serious hindrance to the flow of sewage. The stone used for road-making and repairing is the best that can be procured when the traffic is great, and in general the best stone for this purpose is the heaviest, and the detritus washed into the street gullies is of a heavy nature. It is for this reason that it is caught in the street gullies and removed from them, with the intention of preventing its entry into the sewers, but a large quantity escapes with the water, notwithstanding this provision, because the gully pits are not large enough to act as settling-tanks for the road-drift washed into them in heavy rainfalls. They catch, indeed, but a small portion of it, sometimes, and it would be impracticable to make the pits large enough to intercept much more than ordinary street-gullies do. They are useful, inasmuch as they retain most of that brought into them by light rainfalls; but on the occasion of a strong run of water from the streets a great deal of the detritus is carried into the sewers. It is twice as heavy as water, sinks to the bottom, and forms almost a solid mass, difficult to remove by any means short of manual labour, if left to become hard and concreted. It should be kept moving, to prevent it settling into a solid mass. The drawing, the scale of which is  $\frac{1}{4}$  in. to a foot, shows a flush-tank suitable for a 15-in. sewer, in which is fixed an annular siphon, the inner or discharging leg of which is  $\frac{3}{4}$  in. diameter, its length 4 ft. 6 in., projecting 12 in. below the bottom of the tank, the depth of water being 3 ft. 6 in. With this size of siphon the water-area of the tank should be 40 square feet, say, 10 ft. by 4 ft. or 8 ft. by 5 ft., and, in general, 100 times the sectional area of the pipe, which is made in various sizes,—viz., for a 21-in. sewer, 12 in. diameter; for 18-in. sewers, 10 in.; for 15-in. sewers, 8 $\frac{1}{2}$  in.; for 12-in. sewers, 7 in.; for 9-in. sewers, 5 $\frac{1}{2}$  in.; and for 6-in. drains, 4 in. diameter, their lengths varying from 5 ft. 6 in. to 3 ft., with a projection below the bottom of the tank varying from 14 in. to 10 in., according to the other dimensions. The concrete and brickwork are rendered with cement  $\frac{1}{2}$  in. thick.

But irrespective of this question of road drift,

there are cases in which flush-tanks are still required at the upper ends of sewers. There are two main principles of sewerage with respect to the rainfall. In one it is all carried off by the sewers to the outfall, or to such points in that direction as may be necessary, storm outlets to the river carrying away from these points the excess of water beyond the capacity of the sewers below them. The other principle is to exclude from the sewers as much of the rainfall as may be practicable,—that is to say, the water from the road surfaces and the front slopes of the roofs of buildings, that which falls upon the back slopes, and upon the area of the back premises generally, going into the house-drains and thence into the sewer, the other and greater part being diverted into the old road-drains and culverts, which conduct it direct to the river, or to a stream leading to it. But it is a difficult question, for the first washings of a road surface, where there is much traffic, are as foul as the sewage itself. There are some points in town drainage in which there is room for much improvement, and this is one of them. At present it does not appear practicable to take into the sewers these first washings and exclude the greater quantity which follows in heavy rains; but it may safely be said that to whatever extent this heavy road drift is admitted into sewers it is an enemy to the system, and even if carried to the outfall its objectionable properties remain to be dealt with.

The sewage which arrives at an outfall of a system of sewers has four principal sources: the waste water of houses, trades purposes and public sanitary purposes such as have been named, rainfall, and ground-water. The quantity resulting from the first two sources is that of the water supply, as nearly as can be found by gauging the sewage in dry weather and comparing it with the quantity of water known to leave the service-reservoir during the time over which the gaugings extend. The quantity issuing from the house-drains and from manufacturing premises into the sewers may not be quite so much as that of the water supply, a part being lost by soakage and evaporation; but, on the other hand, there is some small quantity of ground-water, even in dry weather, which nearly equalises the two quantities.

Inasmuch as sewers are made watertight,



they neither let out sewage nor admit ground-water anywhere but at the appointed places; while the house-drains, although they let out no sewage, purposely admit ground-water in the manner pointed out previously. It has, therefore, to be considered that for months together the quantity of sewage will be no greater than the water-supply, while the dimensions of the sewers must be such as to carry off the rain-water which may be admitted to them. Upon this arises the question of density of population per acre of ground, which varies much in different towns and in parts of the same town. In some towns, in parts of the area, and in large towns in most parts, the ground is so covered as to throw off all the rain-water as fast as it falls, the density of population and consequent quantity of sewage per acre being also in these parts greater than the average, while in other parts both these are much less than the average; but inasmuch as all parts may at a future time become closely built over, the capacity of sewers cannot be varied on this account. Most towns average about fifty persons to the acre, from which the quantity of sewage may be calculated; and not more than  $\frac{1}{2}$  in. rainfall in twenty-four hours can be carried off to the outfall in sewers of ordinary dimensions, all water resulting from a rainfall greater than that either overflowing at the storm outlets or being excluded from the sewers. But while the  $\frac{1}{2}$  in. rainfall may in some parts of a town nearly all the water resulting from the average quantity of not more than half the quantity which that rainfall represents, and this is about twice the dry-weather flow of sewage. On these occasions the sewers in the middle and lower parts of a town are well flushed, but it is a very wet day on which  $\frac{1}{2}$  in. of rain falls, and does not often occur, on an average of years. But in the upper parts of a town, towards the dead ends of sewers, the same degree of flushing by rainfall does not take place, and in these parts flush-tanks should be constructed, especially where these upper parts consist of table-land, from which, as a whole, there may be fall enough, but within the district itself the sewers can hardly be kept in working order without them.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

9,273, Fastening Wooden Flooring. C Bennett.

According to this invention, sleepers are embedded in a layer of concrete, and the sections of flooring are secured by means of screws. The spaces between are filled up by strips, and slips are used for concealing the heads of the screws.

10,366, Paint-removing Compound. E. Oates.

This invention relates to an improved composition, and the preparation of the same. Caustic soda is the base of the mixture, which is said to remove the paint without attacking the wood.

11,249, Syphon Drain-pipes. W. Ross.

According to this invention, a syphon-pipe is made with the necessary dip to enable the flowing liquid to form a seal, and the interior of the pipe is coned or tapered, and the crown of the pipe is also extended upwards and formed into a tapered outlet branch. The centre of the pipe has a bulbous configuration, and the ends are made so that they may be connected to any ordinary drain-pipes.

14,402, Self-acting Window-sash Fastening. E. Edwards.

The fastener which is the subject of this patent is fixed at the sides of the window-frame, and consists of an automatic locking arrangement engaging in a rack or ladder catch.

2,844, Artificial Stone. A. C. Ponton and Others.

The novelty which is claimed in this patent consists in the combination of a silicious binding cement with a carbonate of lime and powdered whitening and sand. Articles moulded in this are exposed to a heat of about 360 deg. Fahr., when the plaster will set hard.

3,241, Window Fastening. J. Day.

By means of this invention, instead of the ordinary catch, a double one is provided, with two screws working in the same way that an ordinary sash-fastener acts, but meeting in the centre when closed, and lying back flush when it is desired that the window shall be opened.

3,763, Chimney Cowl or Pot. W. Mitchell and W. T. Hare.

To prevent down-draughts, the cowl which is the subject of this patent is made so that the top and bottom are wider than the central part of the

cowl, either curved or tapering from the outer ends to the centre. The shape of the pot thus resembles that of a dice-box, and it is claimed that this prevents down-draught.

## NEW APPLICATIONS FOR PATENTS.

June 11.—9,693, J. Lord and W. Hays, Water-closets.—9,616, C. Henderson, Heating and Ventilating Houses.—9,628, J. Holland, Water-closets, Lavatories, &c.—9,644, W. Byers, Preventing the Shaking or Rattling of Window-sashes.—9,666, E. Nunn, Base for Plastering, &c.  
June 13.—9,726, F. Bolus, Sewer-gas Preventive Pipe.—9,742, J. Smith, Ventilating Flues for the Prevention of Down Draught.—9,760, A. Katz, Construction of Ceilings.  
June 14.—9,807, J. Upton, Bolts for use with Double-door Cabinets, &c.—9,813, O. Elphick, Syphon Flushing Apparatus.  
June 16.—9,844, J. Hadfield and Others, Manufacture of Asphalt.—9,875, W. High and J. Hannaford, Slabs, Mouldings, and Enrichments for all kinds of Plastering.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

9,694, R. Watson, Window-fastener.—7,492, O. and J. D. Haer, Scaffolding for Decorators, &c.—7,650, H. Whitehouse and J. Clifford, Floor Springs for Swing Doors.—7,696, C. Young, Mortice Locks and Latches.—8,019, W. Macdonald, Ventilation adaptable to existing Sash-windows.—8,150, A. Chartres, Machinery for making Bricks and Tiles.—8,233, J. McLara, Saw-sharpening Machines.—8,428, W. May, Artificial Stone.—8,511, E. Busby, Compounds for the Manufacture of Bricks, Tiles, &c.—8,517, J. Churchill, Ventilation.—8,595, C. Ashworth, Emergency Exits for Theatres, &c.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

9,603, A. Hogan, Building Construction.—10,298, J. Way, Apparatus for Curing Smoky Chimneys.—11,610, H. Johnson, Bricks for Pavements and Floors.—11,811, F. and M. Baker, Door-checks.—12,722, J. F. Fionie, Automatic Door-bottom Guard.—4,322, T. Page, Glazing Bars for Roofs, &c.—6,373, F. Schmitt, Saw-sharpening Machines.—6,653, E. Koster, Wood-carving Machine.—7,040, D. Davies, Window-catch.—7,463, S. Gully, Locking Doors.—7,567, A. Caudie, Combined Burglar Alarms and Sash Locks.—8,060, J. Maw, Metallic Lathing.

## RECENT SALES OF PROPERTY:

## ESTATE EXCHANGE REPORT.

JUNE 12.—By FARMBOURNE, ELLIS & Co. (at Winchester).  
Winchester—F. enclosure of land, 2a, 2r, 16p. .... £250  
JUNE 13.—By WYATT & SON (at Midhurst).  
Sussex, Midhurst—Enclosure of land, 12a, 1r, 12p. .... 1,660  
F. accommodation land, 10a, 3r, 36p. .... 1,600  
Crabrook, Kent—"Hawcock's Farm," 126a, 0r, 16p., f. .... 3,220  
By BENNINGFIELD & TIDY.  
Braughing, Herts—"Dassell's Farm" and 106a, 2r, 20p., f. .... 1,570  
By G. JACKSON.  
Braughing Station, near—"Stockall's Farm," 77a, 3r, 10p. .... 760  
By WEATHERALL & GREEN.  
Forest-hill—55 Housen-rd., f. s. of £30 p.a. .... 330  
Stratford—115, 119, and 121, Angel-rd., f. u. 48 yrs., g. r. £17, 12s. 6d., r. £120 p.a. .... 760  
By MONTAGU & ROBINSON.  
Mottisham—F. g. r. of £45, with reversion in 79 yrs. .... 935  
F. g. r. of £28, with reversion in 80 yrs. .... 660  
F. g. r. of £16, 10s., with reversion in 98 yrs. .... 325  
F. g. r. of £25, 8s., with reversion in 77 yrs. .... 105  
Foot's Cray—F. g. of £65, with reversion in 80 yrs., to r. 34s. p.a. .... 1,220  
By H. DONALDSON.  
Kingsland—142, High-st., u. l. 78 yrs., g. r. £17, r. £20 p.a. .... 745  
South Hornsey—94 and 96, Spencer-rd., u. l. 63 yrs., g. r. £12, r. £40 p.a. .... 420  
JUNE 18.—By A. H. LAWRENCE.  
Acton—24 and 30, Myrtle-rd., f. r. £40 p.a. .... 570  
77, Park-rd., N. W. f. r. £20 p.a. .... 180  
73 and 75, Bole Bridge-rd., f. r. £14 p.a. .... 400  
39 and 41, Stanley-rd., f. r. £47 p.a. .... 380  
1 and 2, Ada-villas, f. r. £43 p.a. .... 405  
By SLADE & BUTLER.  
Twickenham, Cliford-rd., f. land, 1a, 1r, 6p. .... 910  
Reversion to one-sixth share of f. and l. g. r. of £113 p.a., and one-sixth of £139 in cash, life aged 73 yrs. .... 245  
A similar interest to the above sold for .... 216  
By WESTON & SON.  
Brixton—34, Harold-st., u. l. 78 yrs., g. r. £8 .... 400  
189, Brixton-rd., f. s. of £70 p.a. .... 930  
Camwell—8, 10, and 12, Brown-rd., u. l. 80 yrs., g. r. £3, 9s. p.a. .... 550  
By F. HOBSON.  
Broad-green—23, Florence-rd., u. l. 86 yrs., g. r. £7, s. of £42 p.a. .... 350  
Finbury-park—1 and 2, Brown-rd., u. l. 86 yrs., g. r. £14, s. of £20 .... 745  
By BATE & CO.  
Kilburn—34, St. Julian's-rd., u. l. 78 yrs., g. r. £10, s. of £10 p.a. .... 310  
35, Cambridge-rd., u. l. 69 yrs., g. r. £10, s. of £10 p.a. .... 330  
By H. PAXTON.  
Enfield, Gordon Estate—Four plots of f. land, .... 172

By W. T. MARSH.  
Fulham—9, May-st., u. l. 76 yrs., g. r. £4, r. £30 p.a. .... 2,235  
By THURGOOD & MARSH.  
Adelphi—7, York-bldgs, f. s. of £35 p.a. .... 1,260  
By R. BROWN.  
Ratcliff—92, Brook-st., u. l. 145 yrs., g. r. 4s., r. £13 p.a. .... 100  
JUNE 19.—By C. W. MILLAR.  
Hyde-park—14 and 17, Craven-ter., f. r. £195 p.a. .... 3,630  
19, Craven-ter., f. l., with possession .... 1,300  
St. John's-wood—45, Townshend-rd., u. l. 31 yrs., g. r. £10, 10s., with possession .... 400  
By ELLIOTT, SON, & BORTON.  
Hyde-park—21, Pembridge-st., f. r. £330 p.a. .... 7,400  
Red-green—"Ivy House," f. r. £100 p.a. .... 1,600  
Portland Estate—9 and 10, Union-st., u. l. 16 yrs., g. r. £23 p.a. .... 595  
By MENNE, THOLLOWS.  
Bashy-leath—"County End Cottage" and 2a, 2r, 31p., f. r. 2p. .... 1,000  
"Rose Cottage," f. r. 2p. .... 250  
By HOSCOCK, RICHARDS, & CO.  
Homerton—55 to 67, High-st., f. r. £183 p.a. .... 2,760  
By HENRY & LATCHFORD.  
Stockwell—65, Willington-rd., u. l. 63 yrs., g. r. £5, r. £28 p.a. .... 165  
Clapham—61, Old Town, the lease and good-will, u. l. 7 years, r. £20 .... 150  
63, Landor-rd., u. l. 79 yrs., g. r. £7, 1s., r. £20 p.a. .... 310  
39, Landor-rd., u. l. 79 yrs., g. r. £7, 5s., s. of £26 p.a. .... 300  
By FAICHERT & ELLIS.  
Lewisham—38, Limes gr., u. l. 46 yrs., g. r. £4, 10s., r. £30 p.a. .... 200  
Blackheath, Hammer-rd.—"Cannon" and "Middleton" Houses, f. .... 1,135  
JUNE 20.—By W. W. JENKINSON.  
Rotherhithe—Two-fifteenth share of the Lavender Dry Dock area 48,000 ft. .... 616  
One-fifth share of the "Globe Dry Dock," the "Wheatheat" public-house, and 334 and 336, Rotherhithe-st., f. .... 460  
By E. J. BIRLEY.  
Bermondsey—28, 29, and 30, Camilla-rd., u. l. 45 yrs., g. r. £14, r. £98 p.a. .... 750  
32, Southwark-pk.-rd., u. l. 30 yrs., g. r. £7, r. £60 p.a. .... 685  
Deptford—10 to 4, Margaret-pl., u. l. 13 yrs., g. r. £10, r. £52 p.a. .... 200  
Tottenham—1, Caroline-villas, f. s. of £28 .... 230  
Rotherhithe—20, Dilton-rd., u. l. 61 yrs., g. r. £5, r. £28 p.a. .... 160  
By H. W. LILES.  
Leyton—3, 4, and 5, Vinegrove-rd., u. l. 76 yrs., g. r. £15, r. £62 p.a. .... 230  
Plaistow—6 to 8, Railway-rd., u. l. 80 yrs., g. r. £18, r. £62 p.a. .... 480  
Ilford—1, Read-pl., u. l. 81 yrs., g. r. £4, r. £20 p.a. .... 70  
No. 7, Read-pl., u. l. 81 yrs., g. r. £6 .... 75  
By C. O. & T. MOORE.  
East Dulwich—48 and 60, Upland-rd., u. l. 87 yrs., g. r. £4, r. £23 p.a. .... 400  
Limehouse—39, Pigott-st., u. l. 66 yrs., g. r. £4 .... 300  
Mile-end—101, Dempsey-st., u. l. 24 yrs., g. r. £3, r. £20 p.a. .... 280  
Bow—160, 162, 162, and 164, Campbell-rd., u. l. 73 yrs., g. r. £15, r. £124 p.a. .... 790  
Nos. 176 to 182 (even), Campbell-rd., u. l. 73 yrs., g. r. £15, r. £124 p.a. .... 930  
Nos. 186, 190, and 192, Campbell-rd., u. l. 73 yrs., g. r. £10, r. £116 p.a. .... 1,690  
Nos. 1 to 13 (odd), Knapp-rd., u. l. 73 yrs., g. r. £21, r. £197 p.a. .... 1,110  
Bromley-by-Bow—12, Rounton rd., u. l. 73 yrs., g. r. £3, 15s., r. £30 p.a. .... 210  
6 to 67 (odd), Rounton-rd., u. l. 73 yrs., g. r. £6, r. £120 p.a. .... 600  
8 and 10, Glaucous-st., f. r. £47 p.a. .... 460  
By H. J. ELIAS & SONS.  
Mile-end—20 and 24, Logrove-rd., u. l. 39 yrs., g. r. £7, r. £47 p.a. .... 280  
Walthamstow—64 to 68 (even), Borton-rd., f. r. £62 p.a. .... 460  
Hoxton—42, Whitmore-rd., u. l. 30 yrs., g. r. £4, r. £49 p.a. .... 470  
Hackney—102, Mare-st., f. r. £46 .... 606  
Shoreditch—34, Scrutton-st., u. l. 76 yrs., g. r. £20, r. £70 p.a. .... 350  
Stratford—17 to 83 (odd), William-st., u. l. 75 yrs., g. r. £20, r. £46 p.a. .... 2,870  
By NEWSON & HARDING.  
Kingsland—F. g. r. of £100, with reversion in 43 yrs. .... 2,645  
243, 245, and 247, Kingsland-rd., f. r. £90 p.a. .... 2,060  
F. g. r. £350, with reversion in 43 yrs. .... 9,670  
F. g. r. of £260 p.a., with reversion in 3 yrs. .... 800  
JUNE 21.—By G. NEWMAN.  
Blackfriars, 11, Stamford-rd.—A profit rent of £180 a yr., term 78 yrs. .... 1,650  
By R. W. SCORRELL.  
Chislehurst—9 and 11, Stockman's-row, f. .... 1,436  
Belvedere, Kent—A plot of f. land, 2a, 1r, 6p. .... 1,000  
F. plantation and meadow, 5a, 3r, 15p. .... 2,350  
By DOLLMAN & FRASER.  
Belisle-park—1, Lancaster-stables, u. l. 74 yrs., g. r. £5 .... 809  
Barnsbury—15, Hemmings-rd., u. l. 37 yrs., g. r. £8, r. £38 p.a. .... 305  
By FULLER & FULLER.  
Newwood, Anckland-hill—"Rose Villa," f. .... 1,100  
Mile-end—45, 47, and 49, Shandy-st., and 238, 240, and 242, Bow Common-ls., u. l. 38 yrs., g. r. £45, r. £158 .... 400  
Bromley—5 and 9, Froese-pl., u. l. 37 yrs., g. r. £10 .... 60  
By HARDS & BRADLEY.  
Hither-green—9 to 100 (even), Hither Green-lane, f. .... 1,600  
By FURBER, PRICE, & FURBER.  
Bethnal-green—15, Nottingham-st., and 10, 11, and 12, Watcote-st., u. l. 23 yrs., g. r. £20, r. £105 p.a. .... 700  
Hammersmith—An i. g. r. of £10 a year, term 50 yrs. .... 305  
Camden-rd.—5 to 9, Camden-rd., u. l. 37 yrs., g. r. £14, r. £61 p.a. .... 40  
Lambeth—16 to 22 (even), Vauxhall-walk, u. l. 38 yrs., g. r. £10, r. £101 p.a. .... 900



JUNE 21.—By BAKER & SONS.  
Hamstead—"West End House," and 12a. 3r. 30p. £33,000  
Stanley-garden—"Stanley House," 1st 7s 7p. 550  
g.r. 22s 10s, e.r. £120 p.a. 2,500  
Westerham, Kent—An enclosure of land, 7a. 2r. 28p. f. 1,800  
An enclosure of land adjoining, 5a. 3r. 4p. f. 1,800  
"Dunsdale Farm," and 10a. 2r. 1p. f. 4,450  
"Market-garden and fruit land," 17a. 2r. 21p. 2,900  
F. arable pasture and woodland, 19a. 3r. 31p. 2,600  
[Contracts used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; o. for copyhold; l. for leasehold; p.a. for per annum; y. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

## MEETINGS.

SATURDAY, JUNE 29.

Architectural Association.—Third vacation visit,—to the Halls of several City Companies (see advt. in last week's Builder).

St. Paul's Ecclesiastical Society.—Visit to Norwich, under the guidance of Dr. Beaulieu. Train leaves Liverpool-street at 8.40 a.m.

MONDAY, JULY 1.

Royal Institution.—General Monthly Meeting. 5 p.m.  
Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. W. Horn on "Turkish Baths." 8 p.m.

TUESDAY, JULY 2.

Glasgow Architectural Association.—Mr. W. J. Anderson on "The Three Periods of the Italian Renaissance."

Institution of Mechanical Engineers.—Opening of the Summer Meeting, to be held in the Conservatoire des Arts et Métiers, Paris. Paper by M. A. Ansaloni, describing "The Lifts in the Eiffel Tower." M. Gustave Eiffel will give results of working to date.

WEDNESDAY, JULY 3.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting, 8.30 p.m.

Institution of Mechanical Engineers.—Paris meeting (continued).

THURSDAY, JULY 4.

The Royal Archaeological Institute.—(1) Professor B. Lewis on "Roman Antiquities of the Middle Rhine." (2) The Rev. E. S. Dewick on "A Manuscript of Sarum Hours." 4 p.m.  
Institution of Mechanical Engineers.—Paris meeting (continued).

## Miscellaneous.

**Royal Meteorological Society.**—The last meeting of this Society for the present session was held on Wednesday evening, the 19th inst., at the Institution of Civil Engineers, 25, Great George-street, Westminster; Dr. W. Marret, F.R.S., President, in the chair. Mr. W. Marriott gave a very graphic and interesting account of the recent thunderstorms which have prevailed over this country. On Sunday, June 2, a thunderstorm passed across the country in a northerly direction from Wiltshire about 3 a.m., reaching Edinburgh by 10.44. It travelled at the rate of about fifty miles an hour. It is possible that this storm travelled still further north, and reached Kirkwall at 3.37 p.m. A severe thunderstorm prevailed over the neighbourhood of the Tweed between 11 a.m. and noon, and was accompanied by hail of very large size, some of the stones being 5 in. in circumference. A very destructive storm occurred over the whole of the north-west of England and south of Scotland during the afternoon; much damage was caused by lightning, and very large hail fell over an extensive area. Some of the hailstones measured 7 in. in circumference and weighed 7 oz. During the night of the same day a severe thunderstorm prevailed over Norfolk, which was also accompanied by very large hailstones, some of which were 5 in. to 6 in. in circumference. On Thursday, the 6th, thunderstorms prevailed during the afternoon over the whole of the south-east of England. That which passed over the Metropolis about nine o'clock was remarkable for the brilliant and continuous display of lightning. During the same night and in the early morning of the following day a very destructive storm prevailed over the Eastern Counties, much damage being done by the lightning in the north-west of Norfolk. Severe hailstorms occurred between two and three a.m. both at Margate and Ipswich. During the afternoon of the 7th, destructive thunderstorms prevailed over the whole of the southern counties, much damage being done by lightning; while at Tunbridge Wells there was a most remarkable hailstorm. One of the hailstones which was weighed was actually half a pound in weight. An interesting collection of upwards of forty photographs of lightning taken during the storm on June 6 was also exhibited to the meeting. In addition to the sinuous, ribbon, and meandering flashes of lightning, several photographs showed knotted, multiple, and dark flashes.

**Open spaces for Public Recreation.**—At a sitting of the Consistory Court, held on the 21st inst. in St. Paul's, Dr. Tristram, Q.C., Chancellor of the Diocese, granted a faculty to authorise the laying out of St. James's, Clerkenwell Churchyard, in terms of the Metropolitan Open Spaces Act, and the use of a portion of the ground for widening the adjacent St. James's-walk. The Vestry will bear the expense, estimated at 1,100*l.* The present church, dedicated to the apostle and martyr St. James-the-Less, first bishop of Jerusalem, was begun in December, 1788, and consecrated on July 10, 1792. The architect was James Carr, whose son Henry built Salter's Hall. It occupies the site of the St. Mary's Benedictine Convent founded in the year 1100 by Jordan Brisset and Muriel his wife, which at the Suppression was valued as being worth 292*l.* 19s. yearly, and whose lands, of 14 acres in extent, passed ultimately to the Cavendishes. The old church underwent various extensive repairs on three occasions during the seventeenth century. In the Crowle Pennant, at the British Museum, are preserved a unique set of water-colour drawings of many of the numerous monuments and tablets which are specified by Hatton (1708) as being in the church at his day,—including those to Elizabeth, wife to William (Cecil) Earl of Exeter, who "died at her house called St. John's, the 26th day of February, 1653;" Sir William Weston, last prior of St. John of Jerusalem, who died May 7, 1540; and the Lady Elizabeth (died 1585), wife to Sir Maurice Berkeley, after whose family Berkeley-street in this parish is named, and some of which memorials were removed into the existing church. In the burial-ground were interred John Sumner and Richard Perkins, famous actors of the pre-Restoration period, and John Weaver, author of the "Funeral Monuments," its preface dated "from my house in Clerkenwell-close, this 28th of May, 1631," who died in the following year. Due care will be taken of the graves and stones in the churchyard. On Tuesday last, the 25th inst., the Duke of Cambridge formally opened the graveyard of St. Alphege Parish Church, Greenwich, an area of about three acres, which has been secured for public enjoyment through the exertions of Lord Meath's Metropolitan Gardens Association, and is now placed in charge of the Greenwich Board of Works. This church was rebuilt in 1718, from the designs of John James. Here were buried Tallis, the composer; Lavinia, Duchess of Bolton; General Wolfe; and Mr. Angerstein, whose gallery formed the nucleus of our national collection of pictures. We may add that the organ of St. James's, Clerkenwell, built by Richard Bridges, was removed, as we have been informed, to Beccles, Suffolk, in 1796.

**Builders' Clerks' Benevolent Institution.**—A special general meeting of the donors and subscribers to this institution was held at the offices, 21, New Bridge-street, E.C., on Tuesday, the 25th inst., for the purpose of electing a pensioner on the Relief Fund. The applicant was Mrs. Charlotte Tucker, whose case had been fully inquired into and found eligible by the Committee. Being the only candidate, Mrs. Tucker was elected by show of hands, making up the number of pensioners now on the books of the institution to eighteen. The chair was occupied by Mr. H. W. Parker (Messrs. W. Cubitt & Co.) in the absence of the President, Mr. John Aird, M.P., who was unable to attend the meeting.

**The "Butter-walk," Dartmouth.**—At a meeting of the committee of the Architectural Association, held June 21, 1889, it was resolved that—"This Committee having heard of the proposed demolition of the 'Butter-walk,' Dartmouth, for the purpose of erecting a new post-office, desires to record an emphatic protest against a measure which would deprive the town of an extremely interesting and beautiful example of domestic architecture, not merely of local interest, but an object of admiration and regard to all lovers of our national Art."

**Architectural Partnership.**—Mr. Henry Spalding writes from Queen-street, Cheapside: "In consequence of the death of Mr. Patrick Auld, I have taken into partnership Mr. Alfred W. S. Cross, A.R.I.B.A., of Hastings and London. The name of my firm will now be 'Spalding & Cross.'"

**St. Edmund the King and Martyr, Lombard-street.**—This church, we understand, is now threatened with destruction. It is to be hoped that the Ecclesiastical Commissioners will, at all events, not allow the tower to be pulled down.

**Death of Dr. Percy, F.R.S.**—This distinguished savant died on the 19th inst., in his 72nd year. Dr. John Percy was born in Nottingham, and was educated for the medical profession. Establishing himself in practice in Birmingham, he was led by the *genius loci* to take much interest in the chemistry of metallurgical operations, and, according to the *Athenæum*, when the Royal School of Mines was established in 1851, "De la Beche selected Percy for the post of lecturer on metallurgy, a position which he held for twenty-eight years. Abandoning the practice of medicine, he settled in London, and devoted himself to scientific research, taking special interest in the early development of photography. His great object, however, seems to have been the production of an exhaustive treatise on metallurgy, and after years spent in the accumulation of material, his first volume was given to the world in 1861. This dealt mainly with the subjects of fuel, copper, and zinc. It was followed in 1864 by a voluminous treatise on iron and steel, and in due course other volumes appeared, dealing more or less completely with lead, silver, and gold." In 1877 the Iron and Steel Institute recognised Dr. Percy's services to metallurgy by the award of the Bessemer Medal; and only shortly before his death he held the presidency of this Institute. Up to the time of his death he was superintendent of the arrangements for ventilation in the Houses of Parliament. These arrangements are very good, and do not at all merit the harsh terms sometimes said of them by Members of Parliament.

**Royal Agricultural Show, Windsor.**—At Stand No. 134, the St. Pancras Iron Work Company have one of the most generally attractive shows in the yard, as they exhibit a very complete stable with stalls and box, paved, drained, and finished throughout. This company also exhibit various fittings for cowhouses, piggeries, and iron staircases. Messrs. Priestman Bros. (Limited) (Stand No. 297) exhibit three types of engines using common mineral oils for fuel, in lieu of coal. One of them is a 6-h.p. portable engine. Messrs. Winch & Sons (Stand 524) have a variety of exhibits, including horticultural buildings, heating apparatus, &c.

**Institution of Mechanical Engineers.**—In accordance with previous announcements, the summer meeting of this Institution will be held in Paris, and will commence on Tuesday next, July 2. The meetings will be held in the Conservatoire des Arts et Métiers. Among the papers to be read and discussed is the following:—"Description of the Lifts in the Eiffel Tower;" by Mr. A. Ansaloni, of Paris,—supplemented by results of working to date, communicated verbally by Mr. Gustave Eiffel, President of the Société des Ingénieurs Civils.

**Daventry Sewerage.**—It is reported that the Corporation of Daventry have instructed Mr. Bailey Denton, of Westminster, to prepare a scheme of sewerage and sewerage disposal for their Borough.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                    |           |    |           |
|--------------------------------------------|-----------|----|-----------|
|                                            |           | £  | s. d.     |
| Greenheart, B.G.                           | ton       | 6  | 10 7 10   |
| Teak, B.I.                                 | load      | 11 | 0 15 0    |
| Sesqui, U.S.                               | foot cube | 0  | 2 3 0     |
| Ash, Canada                                | load      | 3  | 10 5 0    |
| Birch "                                    | "         | 3  | 10 5 0    |
| Elm "                                      | "         | 4  | 0 5 0     |
| Fir, Dantais, &c.                          | "         | 2  | 0 3 10    |
| Oak "                                      | "         | 2  | 10 4 10   |
| Canada "                                   | "         | 5  | 10 7 10   |
| Pine, Canada yellow                        | "         | 8  | 0 4 0     |
| Lath, Dantais                              | fathom    | 4  | 10 5 10   |
| St. Petersburg                             | "         | 5  | 0 6 10    |
| Waincoat, Riga, &c.                        | load      | 2  | 15 0 4 5  |
| Deal, Finland, 2nd and 1st. std. 100       | "         | 9  | 10 11 0   |
| " 4th and 3rd.                             | "         | 8  | 0 9 0     |
| Riga "                                     | "         | 7  | 10 9 0    |
| St. Petersburg, 1st yellow                 | "         | 11 | 0 11 0    |
| " 2nd "                                    | "         | 10 | 0 11 0    |
| " white                                    | "         | 7  | 10 10 10  |
| Swedish "                                  | "         | 9  | 0 14 0    |
| White Spruce                               | "         | 9  | 10 17 0   |
| Canada, Pine, 1st                          | "         | 16 | 0 26 10   |
| " 2nd "                                    | "         | 11 | 0 17 10   |
| " 3rd, &c.                                 | "         | 8  | 0 10 10   |
| " Spruce, 1st                              | "         | 11 | 0 11 0    |
| " 3rd and 2nd "                            | "         | 7  | 10 9 0    |
| New Brunswick, &c.                         | "         | 6  | 15 8 15   |
| Battens, all kinds                         | "         | 6  | 10 20 9   |
| Flooring Boards, sq. 1 in. prepared, First | "         | 0  | 11 0 14 6 |
| Second                                     | "         | 0  | 8 0 10 9  |
| Other qualities                            | "         | 0  | 6 8 7 9   |
| Cedar, Cuba, foot                          | "         | 0  | 0 4 0 44  |
| Honduras, &c.                              | "         | 0  | 0 44 0 44 |
| Mahogany, Cuba                             | "         | 0  | 0 44 0 64 |
| St. Domingo, cargo average                 | "         | 0  | 0 44 0 64 |
| Mexican "                                  | "         | 0  | 0 44 0 84 |
| Tobacco "                                  | "         | 0  | 0 54 0 64 |
| Honduras "                                 | "         | 0  | 0 64 0 64 |





**LONDON.**—For the repair of two viaducts on the East  
Park Estate, Hampstead, for the London County  
Council:—  
John Oliver ..... £1,050 0 0  
Wm. Pearce ..... 891 0 0  
H. Fowler ..... 580 0 0  
C. H. Hurst ..... 675 0 0  
E. C. Cutting ..... 487 0 0

**LONDON.**—For painting works, &c., at the Fulham-  
road Infirmary, for the Guardians of the St. George's  
Union. Messrs. H. Saxon Snell & Son, architects,  
London:—  
W. M. Littlefield, Lancaster-road,  
Epsford ..... £734 0 0  
W. Watson, 109, Larkhall-lane,  
Clapham ..... 616 0 0  
Vigor & Co., King-street, Poplar ..... 690 0 0  
W. G. Lilly, Whitcomb-street, S.W. ..... 487 0 0  
Geo. Foxley, King-street, Regent-  
street ..... 478 0 0  
W. McCarthy, Oakley-street, Chelsea ..... 465 0 0  
Accepted.

**LONDON.**—For certain works required at No. 319,  
Ridgway-road, W. for Mr. Chapman. Mr. Arthur  
Ashbridge, architect, 78, Leadenhall-street, E.C. :—  
Marks ..... £280 0 0  
Barnes ..... 613 0 0  
Turtle & Appleton ..... 530 0 0  
Lusk ..... 495 0 0  
Taylor ..... 348 0 0

**LONG DITON (Surrey).**—For new billiard-room, &c.,  
at the "Crown and Anchor" Hotel, at Long Ditton,  
Surrey, for the Isleworth Brewery, Limited. Mr. R. T.  
Elsan, architect, Kingston-on-Thames, and Hampton  
Wick. Quantities supplied by the architect:—  
T. Hiscock, Bounlow ..... £291 0 0  
W. Collingham, Ditton ..... 281 0 0  
C. B. Oldridge & Sons, Norbiton ..... 373 0 0  
J. Piller, Teddington (accepted) ..... 357 0 0

**READING.**—For providing and fixing carved pine  
panelling in Billiard-room at Caversham Park, for Mr.  
W. J. Crawshaw. Mr. Charles E. Sayer, architect:—  
C. Hindley & Sons (accepted) ..... £208 0 0

**RINGMER (Sussex).**—For the erection of stables for  
the Southdown Hunt, at the Kennels, for Mr. E. J.  
Streetfield. Mr. Harry Scarlett, L.L.B., architect,  
Uckfield, Sussex:—  
W. F. Martin, Ringmer ..... £787 0 0  
H. Card & Son, Lewes ..... 714 0 0  
Berry & Bussay, Lewes (accepted) ..... 0 0 0

**STONEHOUSE (Gloucestershire).**—For building new  
warehouses, &c., at Stonehouse Mills, for Messrs. R. S.  
Davies & Sons. Mr. W. Clissold, architect, Stroud:—  
Wall & Hook, Brimscombe, Glouce-  
stershire (accepted) ..... £1,513 15 9

**WALTHAMSTOW.**—For erecting the Sir George  
Monoux's Grammar School. Messrs. W. Jacob Gibbon  
and J. W. Stanley Burnester, architects, 36, Great James-  
street, Bedford-square:—  
John Marland ..... £3,255 0 0  
Edward Good ..... 3,238 0 0  
E. Fuller ..... 3,208 0 0  
James Reed ..... 3,190 0 0  
Jos. Holland ..... 3,148 0 0  
Dove Bros. .... 3,125 0 0  
Woodward & Co. .... 3,089 0 0  
W. Shurmer ..... 3,060 0 0  
E. Lawrence & Sons ..... 3,050 0 0  
W. H. Lascelles ..... 2,998 0 0  
Jas. Morter ..... 2,983 0 0  
Macfarlane Bros. .... 2,988 0 0  
S. J. Scott ..... 2,973 0 0  
Green & Lee (accepted) ..... 2,895 0 0

**Shops at Braham.**—The architect for these shops, for  
which the list of tenders appeared on p. 477 of our last  
issue, is Mr. J. Nixon Horsfield, not Horsfield, as printed.

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J. H. (graining no doubt is better done well than ill, but still  
better not done at all).—Y. H. (the question is purely a legal and  
social one, and therefore not within our province).—S. W. R. N.—  
W. S.—A. E. W.—H. T. (no use whatever to ask the question  
on the basis of a mere sketch section. It could only be  
decided in reference to an accurate drawing to scale).—D. A. (no  
enclosure sent; hence unable to answer the matter as  
done with for the present).—S. & M. (should send answers).—S. P.  
(ditto).  
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STONE DEPOT, L. & N. W. Ry., Worship-  
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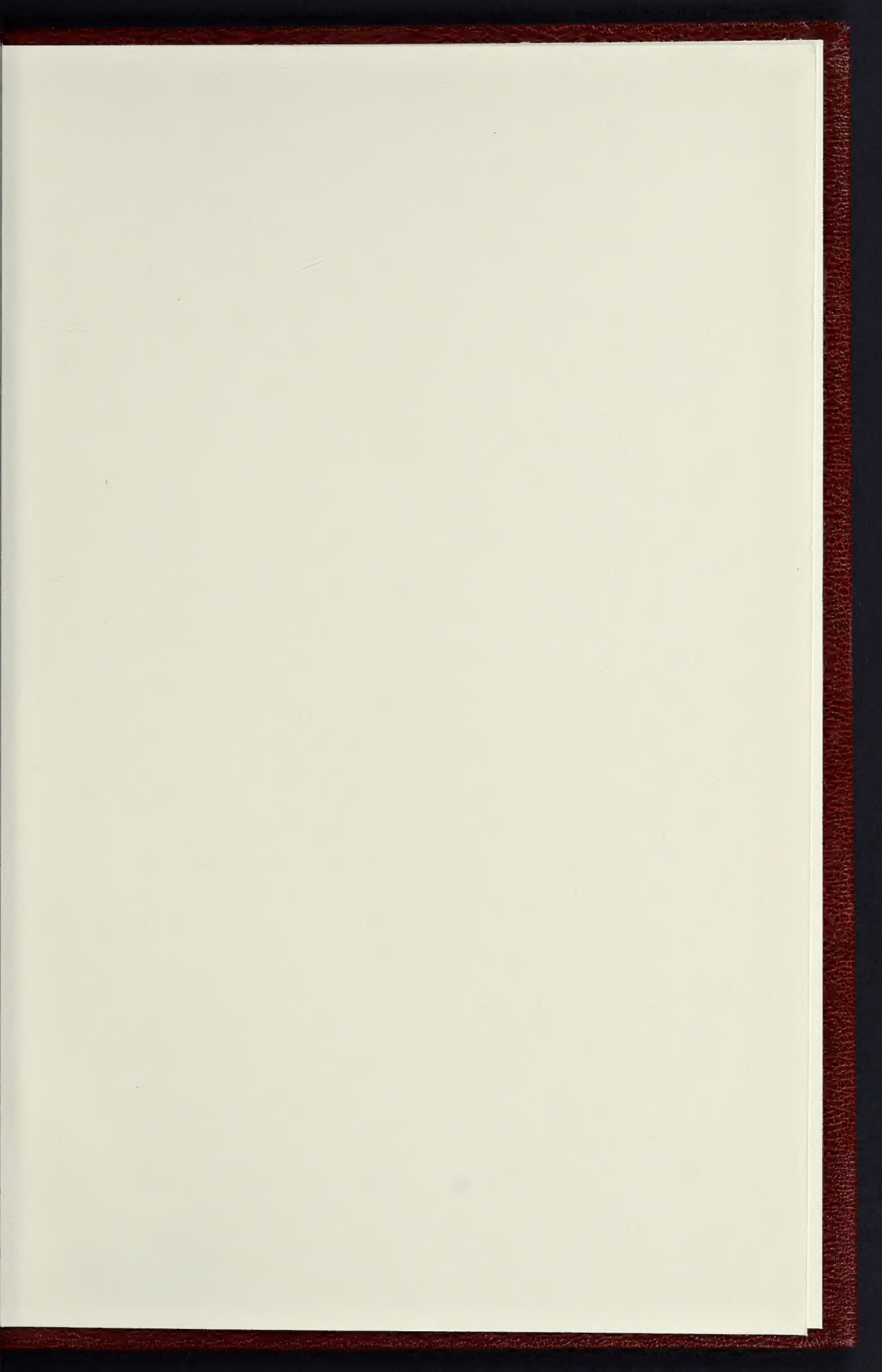
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